



ATTACHMENTS

**Ordinary Council Meeting
Under Separate Cover**

Wednesday, 28 August 2024

Table of Contents

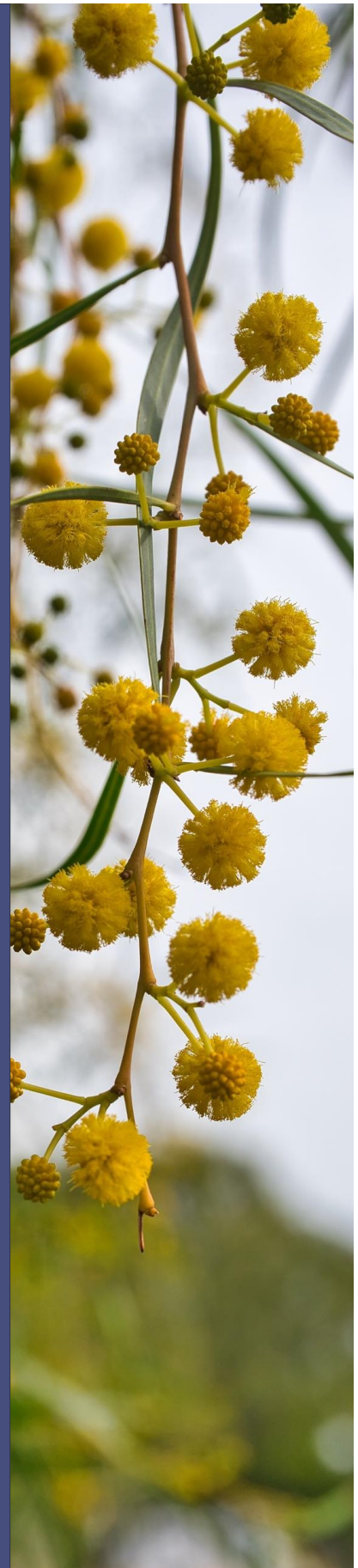
10.2	Mount Isa Economic Diversification and Transformation Strategy	
	Attachment 2	Transitioning Mount Isa's Economy - Agriculture Consultancy - Final Report 4
	Attachment 3	Transitioning Mount Isa's Economy - Critical Infrastructure Consultancy - Final Report..... 107
	Attachment 4	Transitioning Mount Isa's Economy - Energy Consultancy - Final Report 226
	Attachment 5	Transitioning Mount Isa's Economy - Resources Consultancy - Final Report 309
	Attachment 6	Transitioning Mount Isa's Economy - SME Consultancy - Final Report... 357



Mount Isa Transformation of Economy

Agriculture Pillar Recommendation Report

June 2024



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This report is not intended to be read or used by anyone other than Mount Isa City Council.

We prepared this report solely for the Mount Isa City Council's use and benefit in accordance with and for the purpose set out in our engagement letter with Mount Isa City Council dated 18 January 2024. In doing so, we acted exclusively for the Mount Isa City Council and considered no-one else's interests.

We accept no responsibility, duty or liability:

- to anyone other than the Mount Isa City Council in connection with this report
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We make no representation concerning the appropriateness of this report for anyone other than the Mount Isa City Council. If anyone other than the Mount Isa City Council chooses to use or rely on it they do so at their own risk.

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Contents

	Abbreviations	iv
1	Introduction	5
	1.1 Context	5
	1.2 Purpose	7
	1.3 Approach	7
2	Foundations of the Strategy	8
	2.1 Council's vision for the region	8
	2.2 Role of Council	9
	2.3 Industry development pillars	9
3	Stakeholder consultation	10
	3.1 Introduction	10
	3.2 Stakeholder engagement meetings	11
	3.3 Agriculture workshop	18
	3.4 Summary	19
4	Key Considerations	20
	4.1 Introduction	20
	4.2 Weather conditions	20
	4.3 Soil suitability	28
	4.4 Water	30
	4.5 Potential site identification	34
	4.6 Environmental approval processes	38
	4.7 Other considerations	39
	4.8 Summary	43
5	Strategic Framework	44
	5.1 Priority One: Strengthening the existing agriculture sector.	44
	5.2 Priority Two: Diversifying the agricultural sector with new products or industries.	44
	5.3 Priority Three: Enabling opportunities.	45
	5.4 Summary	46
6	Options longlist	47
	6.1 Introduction	47
	6.2 Longlist to shortlist	47
	6.3 Summary	50

7	Options assessment	51
7.1	Introduction	51
7.2	Overview of Options Shortlist	51
7.3	Options Assessment	53
7.4	Preferred Options	61
7.5	Summary	61
8	Project pathways	62
8.1	Introduction	62
8.2	Opportunities	62
8.3	Summary	92
9	Implementation Plan	93
9.1	Purpose	93
9.2	Project lifecycle	93
9.3	Implementation Plan	94
10	Conclusion	100



Abbreviations

Abbreviation	Description
AE	Adult Equivalent
ATAR	Australian Tertiary Admissions Ranking
CRCNA	Cooperative Research Centre for Developing Northern Australia
DAF	Department of Agriculture and Fisheries
DFAT	Department of Foreign Affairs and Trade
DPIRD	Department of Primary Industries and Regional Development (WA)
DRDMW	Department of Regional Development, Manufacturing and Water
DSDI	Department of State Development and Infrastructure
EIS	Environmental Impact Statement
Environmental Authority	EA
ha	Hectare
m ²	Square metres
MICC or Council	Mount Isa City Council
MIM	Mount Isa Mines
MITEZ	Mount Isa and Townsville Economic Zone
MIWB	Mount Isa Water Board
N	Nitrogen
NAPCo	The North Australian Pastoral Company
NRM	Natural Resource Management (group/body)
RDA	Regional Development Australia
SOI	Southern Oscillation Index



1 Introduction

Scyne Advisory has been engaged by Mount Isa City Council (MICC or Council) to develop the Agriculture Transformation of Economy Strategy for Mount Isa. The Strategy forms part of a broader economic reform agenda that is progressing in response to Glencore's announcement in October 2023 that it would close all copper mining operations in Mount Isa by 2025. It is acknowledged that this report, and reporting under the other five pillars of MICC's Economic Transformation Strategy, has been commissioned solely by MICC. MICC should be commended on their proactive approach to this economic transformation, and the ownership they have taken of the strategy. This chapter presents the approach to the Strategy's development and includes:

- Context
- Purpose
- Approach.

1.1 Context

The context for the Agriculture Strategy is provided through an overview of the region and the broader strategic work being undertaken to support the Mount Isa economy, as well as a background on Mount Isa Mines.

1.1.1 Location

Mount Isa is situated in Northwest Queensland which covers an approximate area of 307,000 square kilometres (Figure 1). The region includes nine local government areas:

- Burke Shire
- Carpentaria Shire
- Cloncurry Shire
- Doomadgee Shire
- Flinders Shire
- McKinlay Shire
- Mornington Shire
- Mount Isa Cite
- Richmond Shire

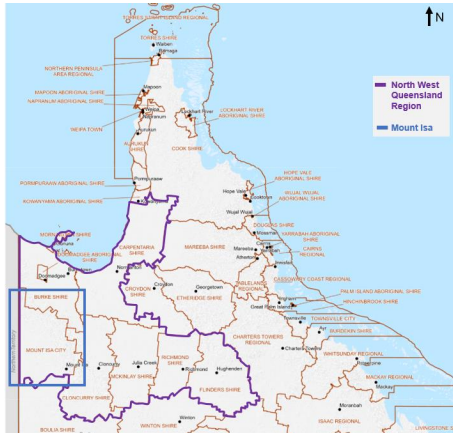


Figure 1: North West Queensland boundary map

Mount Isa shares a boundary with the Northern Territory to the west and includes the township of Camooweal, located 191 kilometres to the north-west. Mount Isa is on the traditional lands of the Kalkadoon people, who followed patterns of hunting and gathering, fishing and trade for many thousands of years before the arrival of the first Europeans.¹ Part of Northwest Queensland including Mount Isa falls within Gulf Country, a lowland region of woodland and savanna grassland surrounding the Gulf of Carpentaria in north western Queensland and eastern Northern Territory. The region also encompasses the Northwest Minerals Province, one of the world's most significant base and precious metals producers.

1.1.2 Mount Isa Mines

Mount Isa Mines was founded in 1924 and has been operated by Glencore since 2013. The mines are the hub of Glencore's copper and zinc operations in Queensland, and it is one of the world's largest mining complexes. In October 2023, Glencore announced that it will cease all copper mining operations in Mount Isa by 2025 due to low-quality ore. At least 1,200 direct jobs will be lost as a result of the mine closure. Without intervention, it is estimated that a further 3,600 jobs could be lost which has the potential to result in a significant decline in Mount Isa's population of approximately 20,000. The closure of Mount Isa Mines calls into question the future of the community which was established around the mining supply chain and relies on the associated economic activity.

The Queensland Government requires any mining operator to rehabilitate land that is disturbed by mining to a safe, non-polluting condition, able to sustain an alternative land use post closure. The rehabilitation work of Glencore will be closely managed by the Queensland Government and protections exist to ensure that the local community can use the land and surrounding areas safely in the future.

Glencore has initiated the development of a Social Transition Plan to address potential issues associated with the mine closure. The purpose of this plan is to develop a prioritised list of initiatives and opportunities to support the local community, workforce and businesses through the transition and into a longer-term future. Over the short-term, Glencore intends to engage a range of community stakeholders, through one-on-one meetings, workshops and public forums to gather insights, ideas and feedback to inform the plan. Glencore's zinc-lead operations reportedly have a strong outlook for years to come and will remain a fixture of the community and economy over the long term. Glencore is processing a range of changes to support continued operations, such as department

¹ MICC. Welcome to Mount Isa. Accessed at: <https://www.mountisa.qld.gov.au/city-and-council/welcome-to-mount-isa#:~:text=Mount%20Isa%20is%20situated%20on,quality%20of%20their%20stone%20implements.>



restructures and adjustments to role accountabilities, operational and process changes to maintain safety, along with workforce reductions at different stages.

1.2 Purpose

The Department of State Development and Infrastructure (DSDI) committed a support package of up to \$50 million for mine workers and the Mount Isa community. Up to \$30 million will be allocated to accelerate development of resource projects in the Northwest Minerals Province over the next five years. Up to \$20 million, to be matched by Glencore, will go toward an economic structural adjustment package for Mount Isa and Northwest Queensland. The Mount Isa Copper Mine Closure Taskforce was established as a joint initiative between Mount Isa City Council (MICC or Council) and DSDI, which is undertaking a priority initiative to accelerate the diversification and transformation of the Mount Isa economy, focusing on six pillars; Energy, Tourism, Resources, Critical Infrastructure, Agriculture and Small and Medium Business.

As at May 2024, Glencore has not published a Social Transition Plan, however, has taken an active role in the work being completed by the Mount Isa Copper Mine Closure Taskforce, and working with consultants engaged under each of the six pillars. Through the Transformation of Economy initiative, the taskforce is strategising the overall diversification of Mount Isa’s economy and identifying pathways to realise investment. The purpose of the agriculture pillar is to identify prospective projects in the agriculture sector to target investment, retain the population base through job creation and build economic resilience.

1.3 Approach

Taking a similar approach to Glencore, the Agriculture Strategy has been informed by comprehensive stakeholder engagement to ensure that the needs of the Mount Isa community are understood and supported, in turn allowing the prioritisation of investment and subsequent actions to be practicable and achievable to drive the desired changes. The strategy’s development has followed a robust four-step process, depicted in Figure 2.

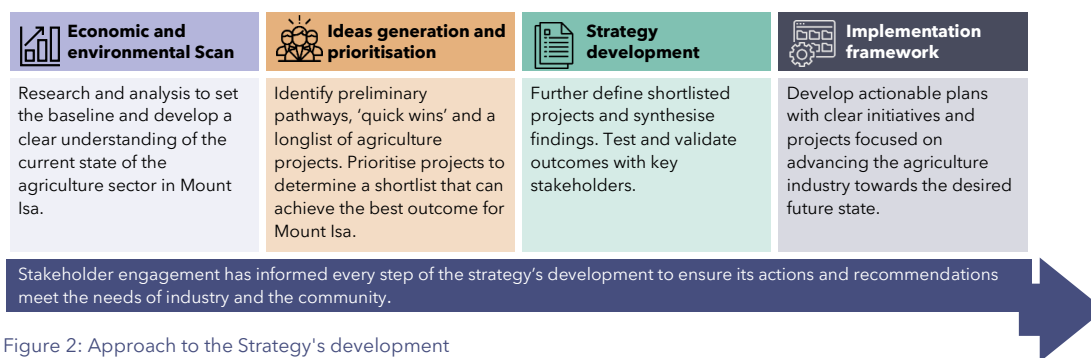


Figure 2: Approach to the Strategy’s development



2 Foundations of the Strategy

This chapter sets out the foundations of the Strategy, including alignment to Council's strategic planning and an overview of the current state of infrastructure in the region. This chapter includes:

- Council's vision for the region
- Role of Council; and
- Industry development pillars.

2.1 Council's vision for the region

Mount Isa City Council's vision for the region is "Making our good city great, through innovation, diversification and cultural enhancement". This vision is underpinned by five themes that guide Council's planning, including:

- **People & Communities:** To establish safe and healthy communities with a strong sense of identity which supports existing industry and encourages new and innovative business and practices.
- **Prosperous & Supportive Economy:** To develop a prosperous and diverse local economy which supports existing industry and encourages new and innovative business and practices.
- **Services & Infrastructure:** To establish innovative and efficient infrastructure networks that services the local communities and industries.
- **Healthy Environment:** To recognise, protect, manage and promote our unique natural environment to ensure the economic, environmental, social and cultural values are developed for long term sustainability.
- **Ethical & Inclusive Governance:** To practice inclusive and ethical governance through proactive engagement with all sectors of the community, council and all levels of government.

This vision is the foundation of the Agriculture Strategy, which at its core is seeking to diversify and enhance the region through innovation and targeted investment.

Council's Economic Development Strategy 2023-2028 (Mount Isa, Moving Ahead), is another central planning tool and key input to the Agriculture Strategy, setting a clear pathway for the region's future. It acknowledges the important role that mining will continue to play in Mount Isa's economic growth, but that a more diversified industrial base that leverages the city's comparative and competitive advantages will create sustainable development. The objectives of Mount Isa, Moving Ahead are to:

- Retain and grow the City's population
- Encourage business retention and expansion
- Attract investment (both people and industry)
- Support industry diversification, growth and development; and
- Promote the development of a skilled workforce and the provision of local jobs.

Through these objectives, Mount Isa, Moving Ahead establishes an overarching focus for the Agriculture Strategy which has guided the ideas generation and prioritisation of prospective projects and actions.



2.2 Role of Council

Mount Isa, Moving Ahead recognises Mount Isa City Council’s committed to providing foundations for growth by working within its remit as a local government authority to drive both community and economic outcomes for the City. Similar to its role in Mount Isa, Moving Ahead, Council will foster sustainable economic transformation and development by delivering on the actions in the Agriculture Strategy and Implementation Framework through the following functions:

- **Planning and advocacy:** Progress or support planning of initiatives and advocate for funding and delivery
- **Reform:** Identify and implement reform areas to support actions and enable economic opportunities, such as through land use planning or development approvals
- **Infrastructure and service delivery:** Collaborate with stakeholders to ensure that the fundamental enablers for investment and economic development are addressed by planning for and providing local and regionally significant infrastructure in an informed, planned and co-ordinated manner.
- **Investment attraction and business support:** Promote the Transformation of Economic Strategy and engage with potential proponents to generate interest. Liaise with industry and local businesses to support growth and ensure community needs are met.

2.3 Industry development pillars

Council has established six pillars of the economic base of Mount Isa which are presented in Figure 3. Strategies and actions established through each of these pillars will support the diversification and transformation of Mount Isa’s economy to build resilience and ensure the community’s future prosperity.

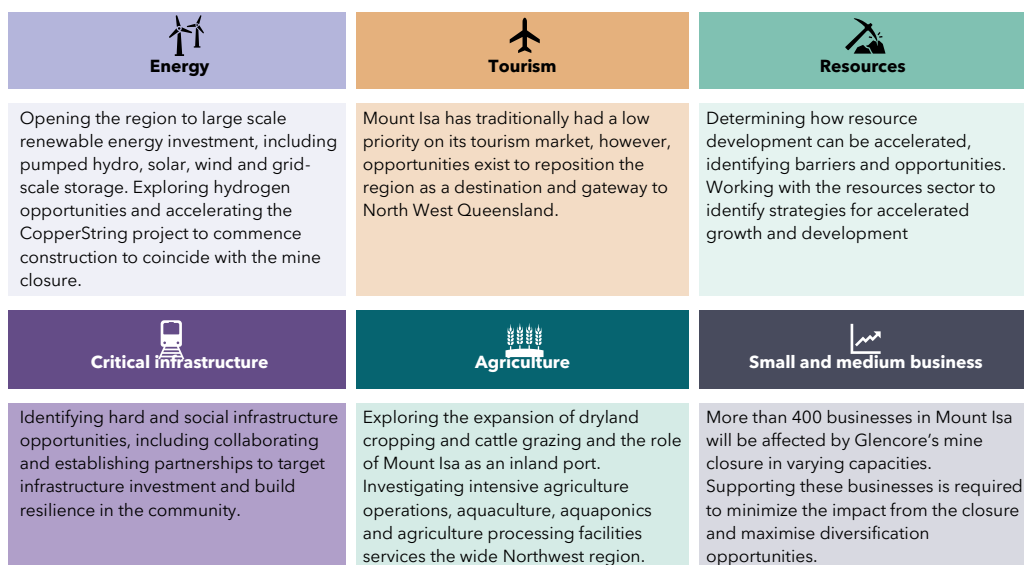


Figure 3: Six pillars of the economic base



3 Stakeholder consultation

3.1 Introduction

To support the recommendations of this report, an extensive series of stakeholder consultations were conducted. During this process participants across a range of industries were consulted, including government, water, mining, aquaculture, education, industry bodies, grazing and environmental. Stakeholder consultation was conducted through a mixture of in-person sessions (either in Mount Isa or Brisbane), videoconferencing and via a public forum workshop. In addition to stakeholder engagement sessions conducted under the agriculture stream of work, Scyne Advisory benefited from consultations conducted under the critical infrastructure stream of work, with dual project team members who were able to share insights internally.

The objective of stakeholder consultations was twofold; first, to obtain a clear picture of the current state of the agriculture industry and its enabling factors in Mount Isa (including environmental conditions, regulatory environment, labour requirements etc.). Secondly, stakeholder consultation sessions provided a forum to both obtain recommendations for improvement, and market test the opportunities that had been developed through market research and early-phase consultation.

Stakeholder consultations have been summarised at a thematic level below, however, will also be referenced throughout the report as relevant.

3.1.1 Strategic approach to communication

The engagement approach developed for the Project was informed by the International Association for Public Participation’s (IAP2) Spectrum (Figure 4). The IAP2 Spectrum identifies the level of participation that defines the public’s role in any engagement program. The IAP2 Spectrum has been used to determine the level and purpose of each engagement, and the most appropriate communication tools to be used.

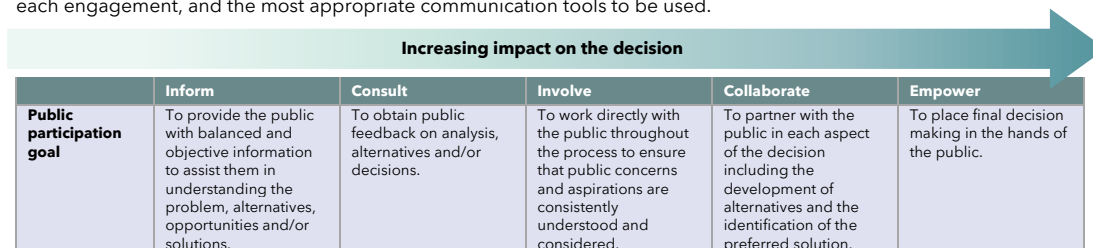
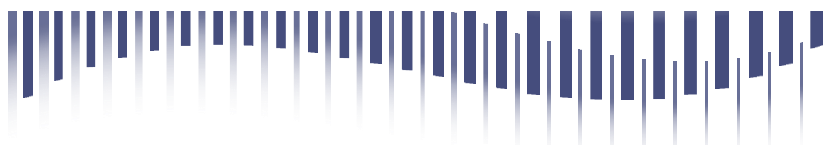


Figure 4: IAP2 Spectrum

The stakeholder engagement process included:

- **Identify stakeholders:** A list of stakeholders was provided by MICC and further refined by Scyne Advisory.
- **Confirm stakeholder priority with MICC:** The engagement of each stakeholder was prioritised, informed by their relevance and importance to the agriculture pillar, the desired outcomes from the engagement, and the likelihood of an effective and informative engagement.
- **Assign appropriate method of engagement:** Each stakeholder was assigned a type of engagement, ranging from formal face-to-face consultations to informal discussions or updates via email. This was generally determined by the allocated priority.



- **Contact and engage:** The approved stakeholder engagement participants were contacted by the appropriate party and, where feasible, engaged in a timely manner in line with the prioritisation of each engagement.
- **Analysis:** The outcomes of the stakeholder engagement were used to develop an understanding of the challenges and opportunities in the region and inform the development and prioritisation of potential initiatives.

Stakeholder feedback has been instrumental in the Agriculture Strategy’s development. Those involved are presented in Table 1 will remain an integral part of the Strategy’s implementation, and Council will continue to consult with industry and community to ensure ongoing support and that it is delivering on Council’s objectives for the region.

3.2 Stakeholder engagement meetings

Table 1 outlines the consultation high level findings and key themes identified during the stakeholder engagement phase of this project.

Table 1: Stakeholder consultation outcomes

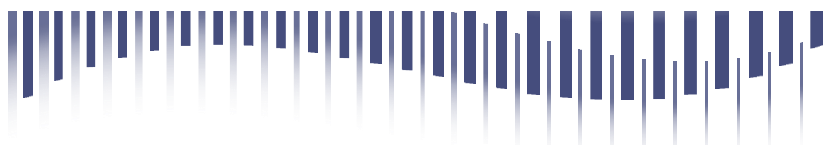
Stakeholder	Consultation findings / themes
<p>The Department of State Development and Infrastructure (DSDI) <i>Queensland Government Department</i></p>	<ul style="list-style-type: none"> • Confirmed climatic conditions and current profile of Agriculture sector in Mount Isa (being heavily dominated by grazing). • Outlined challenges in establishing irrigated cropping opportunities in the North West, including details of previous trials. • Outlined funding avenues available to prospective opportunities. • Discussed logistics concerns in the Mount Isa region including road, rail and sea transport. • Discussed challenges with energy cost and access in the Mount Isa Region.
<p>The Department of Agriculture and Fisheries (DAF) <i>Queensland Government Department</i></p>	<ul style="list-style-type: none"> • Confirmed challenges in establishing irrigated cropping opportunities in the North West, including details of previous trials. • Discussed challenges in transformative change in the agriculture industry (i.e. turning graziers into crop farmers). • Discussed the impact of recent policy decisions to unlock capacity in stored water, including the introduction of new skilled farmers to the region with an expanded scope of prospective operations. • Outlined the difficulties in establishing aquaculture projects in the North West due to climatic conditions and the skilled workforce required for these projects. • Discussed challenges regarding export of live cattle from the North West to an Asian market within the context of biosecurity laws and export agreements.



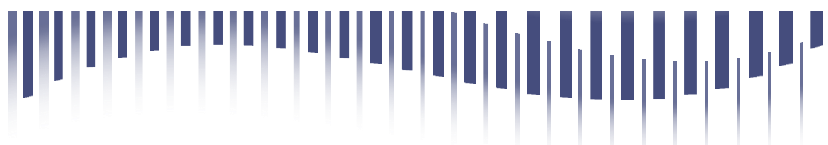
Stakeholder	Consultation findings / themes
<p>The Department of Regional Development, Manufacturing and Water (DRDMW) <i>Queensland Government Department</i></p>	<ul style="list-style-type: none"> • Discussed water access requirements across catchment areas including the use of surface water, regulated ground water, storage requirements and bores. • Clarified some queries made by local graziers during the March 19 agriculture workshop with respect to water access rights. • Discussed the commercial remit of Sunwater with respect to selling unused allocation, and the process of acquiring sub-allocations from existing customers. • Questioned the absence of a water allocation trading platform, including whether this would increase transparency and provide greater opportunity for prospective investment. Ultimately the Department’s view was that the absence of a platform is not the primary driver for the minimal transactions in the water space. • Outlined the use of water as an equity asset, and the impact on price as a result. • Discussed in detail the regional water assessment process and Gulf Plan review, as well as the anticipated future direction of water policy and the impacts this might have on the agriculture sector in the Mount Isa region.
<p>Sunwater <i>Government owned water supply company</i></p>	<ul style="list-style-type: none"> • Confirmed unused allocations in Lake Julius held by Sunwater and its subsidiary Northwest QLD Water Pipeline. • Discussed challenges of transporting water from Lake Julius due to its location. • Discussed the history of large-scale irrigation schemes within the region, noting limited history in the MICC region, but some success in Cloncurry Shire. • Outlined the requirements that a proponent would need to satisfy to present a sound business case to Sunwater for unused allocations. • Confirmed definitions of water reliability and confirmed the water reliability of Lake Julius. • Discussed Sunwater’s current infrastructure assets, as well as previous proposals for new infrastructure which have not yet materialised. • Discussed a breakdown of costs for water access and storage, confirmed that the majority of cost is associated with transport, particularly for Lake Julius due to its location. While costs for water are commercial-in-confidence, Sunwater is welcoming of any commercial discussions with prospective customers who require access to stored water for project development.



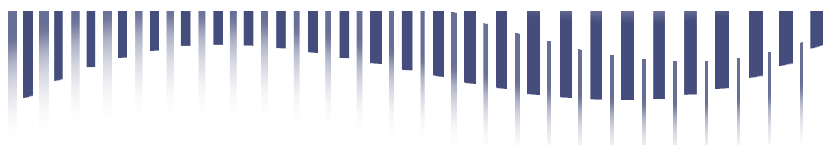
Stakeholder	Consultation findings / themes
<p>Mount Isa Water Board (MIWB) <i>Government owned water authority</i></p>	<ul style="list-style-type: none"> • Outlined the core purpose of the MIWB, that is as an infrastructure business, not a water trader. MIWB generates revenue from the infrastructure they operate, not by selling water. • Confirmed the main water sources servicing the Mount Isa region. • Confirmed the main customers of those water sources and that this customer base remains relatively static. • Discussed commercial constraints with MIWB’s business model, including limitations on building infrastructure assets with uncertain commercial viability. • Discussed the challenges and costs of obtaining power in the Mount Isa region. • Discussed some of MIWB’s goals for future improvements in infrastructure, as well as plans for offsetting some power consumption / cost through the use of renewable energy.
<p>Cooperative Research Centre for Developing Northern Australia (CRCNA) <i>Industry group</i></p>	<ul style="list-style-type: none"> • Confirmed opportunity to support forage crops and grazing is likely to garner greatest community and industry support. • Discussed the need to investigate opportunities in protected cropping and high value agriculture, such as fruit trees, however noted that access and availability to water will be challenging. • Highlighted Mount Isa’s strength as an industrial base for North West Queensland, however is challenged by transport costs to market. • Highlighted Mount Isa’s access to relatively cheap land and water availability, however noted challenges in cost of water distribution. • Discussed that to be successful and of-scale, an agricultural opportunity or project will need to confirm cost efficient access to transport being two-way access (refrigerated road and rail).
<p>Mount Isa and Townsville Economic Zone (MITEZ) <i>Industry group</i></p>	<ul style="list-style-type: none"> • Highlighted importance of Mount Isa to Townsville Rail and significance of consultation with the North West Logistics Roundtable which includes Queensland Rail, Aurizon, Port of Townsville, North West Phosphate and other companies. • Emphasised logistics as being key to a successful agriculture project, particularly around rail and road policy mechanisms. • Energy and water were also highlighted as key drivers of the industry. • Highlighted the Pirrone Brothers of north Queensland as a good example of a successful protected agriculture venture in regional Queensland. • Mentioned the importance of considering mosaic farming and agrivoltaics.



Stakeholder	Consultation findings / themes
<p>Fish Farmers <i>Aquaculture company</i></p>	<ul style="list-style-type: none"> • Outlined the water requirements of a typical aquaculture system, and the efficiency with which the system retains that water. • Outlined the typical output of an aquaculture system by size for both vegetables and fish, and provided context of water usage to output. • Described the maintenance and upkeep processes for aquaculture systems, including cost, technology and skills / labour required. • Discussed additional system requirements such as a 24hr energy supply and the availability of oxygen to support the aquaculture system. • Discussed potential risks of the system, for example pests, power loss, climatic conditions and other factors which would impact the economic viability of the opportunity. • Discussed possible commercial pathways to establishing an aquaculture industry (e.g., as a purely commercially driven operation from a new proprietor, or perhaps as an ESG initiative from a large mining operation).
<p>Southern Gulf NRM <i>Natural resource management group</i></p>	<ul style="list-style-type: none"> • Confirmed Southern Gulf's role as an NRM body supporting initiatives related to the natural environment of the Mount Isa region (and their extended jurisdiction in the North West). • Confirmed common programs run by Southern Gulf are in the areas of flood impacts, riparian health, biodiversity, pest and weed management etc. • Discussed a case study at Carlton Hill station to improve stocking rates and acknowledged that there are a number of similar smaller projects or trials occurring with the intention to support the local grazing industry. • Confirmed that Southern Gulf welcomes the direct involvement of MICC or other State Government Departments who are interested in the results / providing additional funding to current trial programs.
<p>Wandarra Group (Hemp) <i>Hemp processing company</i></p>	<ul style="list-style-type: none"> • Provided an overview of the organisation's hemp product development and processing. • Confirmed interest in opportunities to invest in regional Queensland (Townsville). • Outlined need for hemp manufacturing facility in Queensland, although unlikely to be in Mount Isa. • Discussed the possibility of conducting a pilot processing project in North West Queensland, however mentioned the challenges with transport and logistics costs. • Confirmed domestic and global demand for hemp-based products is strong. • Confirmed hemp processing by-products may be used for animal feed, and so a local processing facility set up in regional Queensland could supply this feed to Mount Isa. • Discussed the potential for the processing facility to be multi-product with sesame and other grains. • Outlined the water requirements of hemp to be approximately 5ML/ha, about 20% more water efficient than cotton.



Stakeholder	Consultation findings / themes
<p>Glencore <i>Mining company</i></p>	<ul style="list-style-type: none"> • Attended a session with all consulting firms and Glencore’s local leadership team led by Maryann Wipaki. • Discussed Glencore’s current water allocation, water usage and expected future usage after the partial shutdown of mining operations. • Understood the operational constraints facing Glencore with respect to the decision to shut down mining operations. • Outlined the current workforce profile of Glencore and obtained details on demographics as well as intention of some employees to remain in the Mount Isa area. • Obtained information on Glencore’s planned environmental rehabilitation actions.
<p>RDO Equipment <i>Rural merchandiser</i></p>	<ul style="list-style-type: none"> • Discussed the need to develop new skills in order to launch a successful new cropping venture (irrigated or dryland) and the fact that grazing skills are not transferable to cropping. • Discussed suitability of land to dryland cropping, including requirements of large fields of black soil and high average rainfalls. • Explored the potential of growing cotton in the Northern regions (north of the Flinders Highway). • Identified the variability in investment in agriculture in the Northern region in response to droughts in the Southern regions. • Discussed the need for a farming enterprise that co-exists with, or supports existing grazing operations, for example forage sorghum, which has a number of benefits.
<p>North West Phosphate <i>Mining company</i></p>	<ul style="list-style-type: none"> • Provided an overview of North West Phosphate operations. • Discussed the agricultural output products that would require third party for additional process include: <ul style="list-style-type: none"> ○ Single super phosphate ○ Addition to NPKS fertiliser blends ○ Soft rock phosphate products (e.g., Eco Growth_ ○ Animal lick blocks ○ Animal supplement (e.g., soft rock phosphate blended with molasses). • Discussed the plans for agriculture ready products to be retailed directly from the mining operation in the Mount Isa region. • Phosphate-based products required by agriculture enterprises in the region will be sourced from rural merchandise resellers who will source these products from a range of suppliers, which may or may not include products derived from North West phosphate mining operations.



Stakeholder	Consultation findings / themes
<p>Elders <i>Rural merchandiser / real estate</i></p>	<ul style="list-style-type: none"> • Discussed the strengths and challenges of the agriculture industry in Mount Isa. • Discussed trends in grazing and farming operations across the region, and market tested some product opportunities from the longlist. • Identified potential land / property solutions for some longlisted initiatives. • Developed new opportunities based on available property in the region. • Gathered information regarding logistics cost for road transport in the agriculture sector.
<p>Incitec Pivot <i>Chemical company</i></p>	<ul style="list-style-type: none"> • Discussed the company profile of Incitec Pivot, including the 450 direct jobs and 800-900 direct jobs contributed to the economy. • Discussed the nature of their manufacturing business including the use of sulfuric acid produced from the Glencore copper smelter in Mount Isa. • Discussed the business process and outputs of the Phosphate Hill site. • Outlined major barriers to growth including Energy and Transportation <ul style="list-style-type: none"> ○ Energy - Copperstring connectivity via the Southern Spur is crucial to business expansion / operation and is deemed to be less certain under QLD Government ownership. Early stage feasibility is being conducted on solar energy, and hydrogen is not expected to be economical until 2040. ○ Transport - Incitec Pivot is responsible for 15-25% of port traffic and 50% of rail load out of the region. There were concerns on both the reliability and business practices of the Mount Isa line, including discourse on whether the purpose of the line is to generate revenue or stimulate economic activity.
<p>TAFE Queensland Queensland Government education provider</p>	<ul style="list-style-type: none"> • Gained an understanding of current course offerings from TAFE Queensland in Mount Isa. • Developed a further understanding of the education sector in Mount Isa, including the link between schools, TAFE Queensland and employers. • Market tested some educational opportunities from the project shortlist.



Stakeholder	Consultation findings / themes
<p>Regional Development Australia (RDA) <i>Government funded advocacy group</i></p>	<ul style="list-style-type: none"> • Gained an insight into priority projects in Mount Isa and the North West, as well as a history of agriculture projects in the region. • Market tested a number of proposed initiatives from the project longlist. • Discussed underinvestment in the transport corridor for the North West as a possible contributor to prohibitive freight costs, and the impact of this on new and existing industries. • Discussed RDA’s upcoming Strategic Regional Plan, currently in the consultation phase, and priority economic development areas for the region. • Discussed costs and availability of water in the region in the context of agricultural activity (specifically food production). • Discussed the potential long-term impacts of Glencore’s reduction in activity and the self-fulfilling effect that this can have on further investment in the region. • Discussed housing and liveability as a method of attracting and retaining people to the region and contributing to the local economy. • Discussed the possible expansion of government services in the region, including defence, health and other essential services.
<p>North Australian Pastoral Company (NAPCo) <i>Large grazing company</i></p>	<ul style="list-style-type: none"> • Discussed the scope of NAPCo’s operations in the Mount Isa region and more broadly across Queensland. • Discussed the labour requirements of NAPCo’s workforce, and the challenges the face in attracting and retaining local staff. • Discussed career pathways within the grazing industry. • Outlined the operational requirements of a large-scale grazing company, including the amount of feed that is required to sustain their herd. • Market tested, and gained support for, potential opportunities from the project shortlist in education, business development and cropping. • Discussed the regulatory and legal environment as well as government relations issues facing NAPCo.
<p>Findley Farms</p>	<ul style="list-style-type: none"> • Discussed Findley Farms’ operations in the region, currently a 2000ha property near Julia Creek which is targeted to increase to 8000ha in the next 5 years. • Findley Farms sees a huge potential for Agriculture across the broader region of North west Queensland, and acknowledges the importance of Mount Isa as a hub for the region, especially with regard to transport and logistics. • Findley Farms expressed a desire to hire more people in the Mount Isa region, as opposed to relying on employment pathways from Southeast Queensland. • Findley Farms is currently focused on cotton due to its commercial viability, discussed barriers to expansion with cotton cropping currently including energy, water and access to a cotton gin. • Findley Farms identified themselves as a potential proprietor for further agriculture opportunities in the region.



3.3 Agriculture workshop

3.3.1 Introduction

On March 19, 2024 the Project Team facilitated a public forum workshop in Mount Isa with agricultural landholders, the grazing industry and representatives from other agriculture-related association. The organisations with representatives present at the workshop are outlined in Table 2.

Table 2: Agriculture Workshop attendees

Government	Local industry	Associations
<ul style="list-style-type: none"> Department of State Development and Infrastructure (North West region) Department of Agriculture and Fisheries (Townsville region) Mount Isa City Council (Senior officers, Councillor and Mayor) 	<ul style="list-style-type: none"> West Leichardt Station Lagoon Creek Station Country Real Estate 	<ul style="list-style-type: none"> Cooperative Research Council for Developing Northern Australia (CRCNA) Mount Isa to Townsville Economic Development Zone (MITEZ)

3.3.2 Workshop outcomes

The stakeholder workshop was an opportunity to bring together local graziers and other industry relevant stakeholders in an open forum to discuss the strengths and weaknesses of, and opportunities for, the agriculture sector in Mount isa.

The workshop began by introducing the background and context of the Mount Isa Economic Transformation project and providing information regarding the partial shutdown of Glencore's mining operation. Given the attendance of local residents and other significant industry figures, the workshop session provided an opportunity to raise awareness for both the economic challenges facing Mount Isa, but also the comprehensive plan being implemented by MICC to safeguard the economic prosperity of the region. The Scyne Advisory team outlined the objectives of the agriculture pillar of the strategy, and sought to create buy-in amongst participants to support the shared goal of economic development in the region.

The first working session of the workshop was an information gathering session, designed to fit the seasonal activities of local graziers and other members of the agriculture sector. The project team collected information on typical on-farm activities on a season-by-season basis, restrictions for completing those activities, future opportunities for business development, and what support might be required to achieve these opportunities. This working session was effective in identifying a number of new challenges faced by local farmers on a seasonal basis. Common concerns raised included the impact of biosecurity regulations on farm work, delays in road grading and repairs which impact the ability for graziers to bring cattle to market (i.e., sealed roads allow greater access to markets than gravel roads which are subject to damage), land tenure issues which prevent on-farm development work and many more useful insights. The insights gained from workshop participants have been incorporated into prospective opportunities which are discussed in the remainder of this report. Hearing directly from local landholders was an insightful experience which highlighted the true pain points of the local industry. Recommendations contained in this report have been heavily influenced by what was heard in this session and throughout the broader stakeholder consultation campaign.

The second working session of the workshop was an opportunity for the project team to test a range of potential agriculture projects with individuals who had the subject matter expertise to evaluate them. It was also an opportunity to test the framework with which future agriculture opportunities would be evaluated (outlined in section 6.2). The project team outlined a range of opportunities from the opportunity longlist under the broad categories of grazing support and forage crops, protected cropping, dryland cropping, intensive agriculture and



bespoke opportunities (see section 5). Feedback was sought on these longlist options, and was largely consistent with desktop research and internal subject matter expertise on challenges with cropping in the Mount Isa region (e.g., soil, rainfall, temperatures).

An indirect benefit to the workshop was that participants reflected it was a good opportunity to have their concerns heard, as there is not always a forum to allow this in the agriculture sector. The feedback received throughout the session was invaluable in drafting further recommendations to support the agriculture sector in the Mount Isa region, and led to several new connections which supported the project team's broader stakeholder engagement campaign.

3.4 Summary

The agriculture industry workshop conducted on 19 March 2024 was a valuable opportunity to bring together a range of stakeholders with a vested interest in developing the agriculture sector in the Mount Isa region. The workshop was well attended by local landholders and businesspeople, government representatives and representatives of industry bodies. The session was effective in its main goals of, raising awareness for the critical economic situation facing Mount Isa and MICC's response, identifying the challenges facing the local agriculture industry, and market testing prospective opportunities with local subject matter experts.



4 Key Considerations

4.1 Introduction

This section outlines the key considerations for successful planning and execution of agricultural projects. These considerations are critical to the strategic decision-making process and ensuring that each project is economically and environmentally viable.

This section will include site selection, resource availability and logistical considerations, and serve as a precursor to more detailed explorations of each topic as they relate to specific agricultural opportunities. This section also aims to provide information in a manner that is agnostic to the project shortlist, which can be applied independently to assess future opportunities that are not covered in this report.

4.2 Weather conditions

This section investigates the weather patterns and conditions within the Mount Isa region based on weather data from the Bureau of Meteorology (BOM) station located at the Mount Isa Airport. The data has been collated from all available data collected since 1966 (57 years) and will assist in the review of the following parameters:

- Temperature
- Humidity
- Rainfall
- Climate change.

4.2.1 Temperature

This section assesses the historical temperature variability in Mount Isa. The data has been sourced from BOM and is summarised in Figure 5.

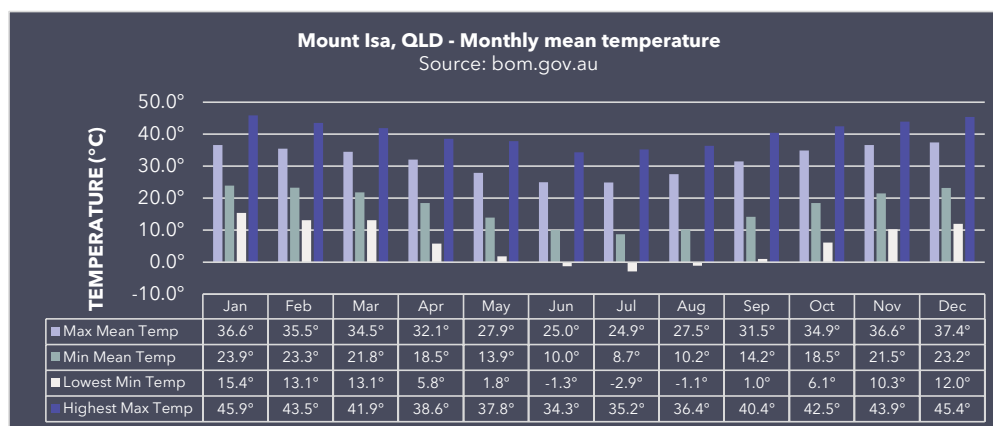


Figure 5: Mount Isa mean temperature

Based on Figure 5, the key temperature statistics are as follows:



- The average maximum temperature ranges from 25°C in July to 37.4°C in December, which is considered high and can impact the region's ability to produce certain crop types (such as cotton, mungbeans or sorghum).
- The average minimum temperature ranges from -2.9°C in July to 15°C in January, with a risk of sub-zero temperatures between May and September.

Maximum temperatures

The monthly data indicates that historically throughout the year, the temperature can peak between 34°C to 46°C. This is particularly important to consider, as for many crops, there is a negative response when temperatures go above approximately 35°C. Temperature control and mitigation practices may need to be considered when investigating what crops could successfully grow in this region and not be impacted by the high temperatures. This will be a significant consideration for perennial horticulture crops.

Historically, the average number of days where the temperature has reached high temperatures where a negative crop response may occur are:

- Days $\geq 35^{\circ}\text{C}$: 127 days per year
- Days $\geq 40^{\circ}\text{C}$: 22 days per year.

This means that in an average year, temperatures in the Mount Isa Region reach 35°C or above 41 per cent of the time. Managing these high temperatures on a regular basis is difficult but can be mitigated to some extent through the implementation of cooling misters/sprinklers, shade structures or protected structures however, managing temperatures above 40°C is typically less effective.

Maximum temperatures experienced in the region will have an influence on the types of crops that can be productively and economically grown.

Minimum temperatures

The average historical minimum temperature by month in Figure 5, shows a range of 8.7°C to 24°C. Historically, the lowest minimum temperature recorded ranges from -2.9°C to 15.4°C, with a risk of frost (sub-zero temperatures) between May to September. The risk of frost will need to be considered during the crop selection process, as well as the potential requirement for relevant management and mitigation practices.

Historically, the average number of days where the temperature has reached significantly low temperatures where a negative crop response may occur are:

- Days $\leq 2^{\circ}\text{C}$: 3 days per year
- Days $\leq 0^{\circ}\text{C}$: 1 day per year.

Of all available recorded temperatures in the Mount Isa region, there are a total four days per year which reach 2°C or below and may lead to minor chill damage or major frost events. Managing these low temperatures, requires frost mitigation practices such as frost fans and irrigation systems to manage crops that are sensitive to frost damage. However, based on accumulated data recorded since 1966, frosts can be considered a rarity in Mount Isa due to its location and topography.²

In summary, the temperatures experienced within the Mount Isa region are considered mild to high, for majority of the year. However, due to the location of Mount Isa being situated in between the Selwyn ranges, and the higher elevation of the Northwest uplands in the surrounding area, a significant moderating effect on temperature occurs in comparison to the neighbouring townships (Cloncurry, Boulia, Winton and Urandangie) which experience much

² Australian Government, Bureau of Meteorology, n.d. *Climate of Mount Isa*. Accessed at: http://www.bom.gov.au/qld/mt_isa/climates.html



higher temperatures. This is important to consider when identifying which crops would perform well in Mount Isa, and the surrounding region as conditions can differ significantly.³

4.2.2 Humidity

The historical humidity data has been sourced from BOM and is summarised in Figure 6, with all data presented as per cent moisture (%).

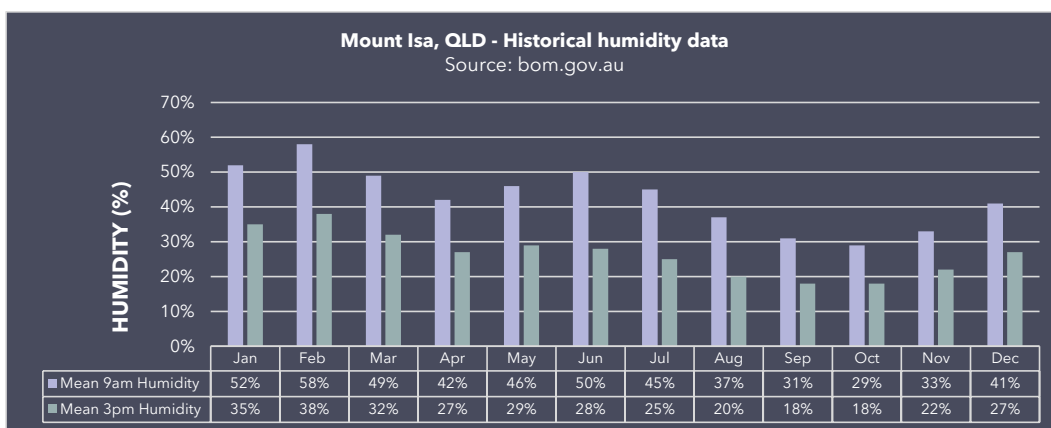


Figure 6: Mount Isa historical humidity data

Figure 6 shows that the historical average humidity recorded at 9am ranges between 29% to 58% whilst the average humidity recorded at 3pm ranges between 18% to 38%, with humidity values the lowest during August to November. As humidity levels drop, the evaporative loss of water from plants increases, contributing to the depletion of soil moisture and thereby increasing the requirement for applying irrigation. In combination with a typical increase in vegetative growth during the August to November period, lower humidity will strongly influence the water use of most irrigated perennial crops and annual crops. When considering an irrigation demand budget, in conjunction with crop stage and rainfall, humidity will also be considered a key influence on daily water demand.

4.2.3 Rainfall

This section assesses the historical rainfall variability in Mount Isa. The data has been sourced from BOM and is summarised in Figure 7, with all data presented as millimetres (mm) of rain.,

³ Australian Government, Bureau of Meteorology, n.d. *Climate of Mount Isa*. Accessed at: http://www.bom.gov.au/qld/mt_isa/climates.html

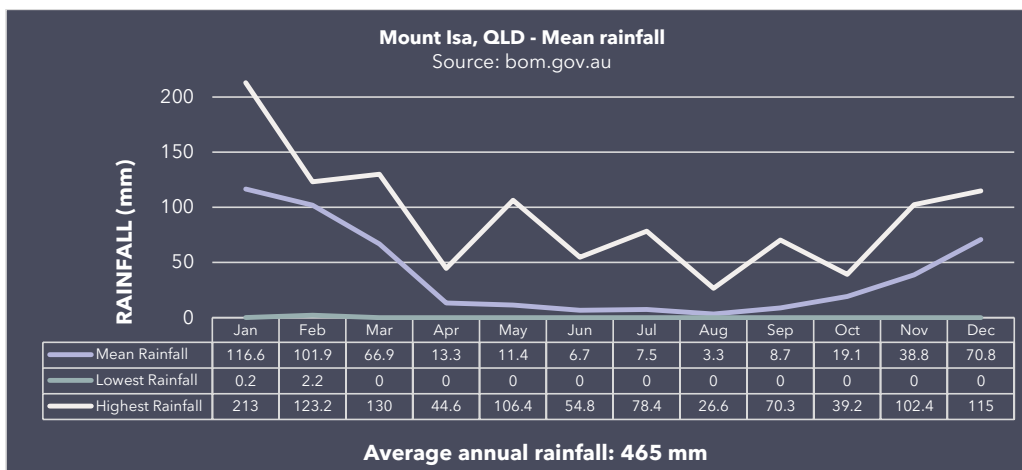
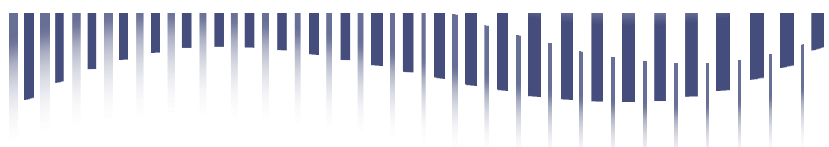


Figure 7: Mount Isa historical rainfall data

Mount Isa has a recorded historical average rainfall of 465mm per year. The highest average rainfall occurs within the summer months, November to March, with a range of 67mm to 117mm average per month, as either thunderstorms or rain depressions. These down pours are usually suited to irrigated perennial crops (e.g., forage crops), summer grown annual crops or pasture, as rainfall will occur during periods of peak water demand for these certain crop types. Historically, the average number of days where the rainfall has reached ≥ 25 mm is six days per year, which is considered very low and not beneficial for crop production and building soil moisture levels in the soil profile.

The lowest yearly recorded rainfall occurred in 2013 with only 93mm and the highest in 2011 recording 1,092mm.⁴ These figures represent a significant variability which will influence the required water allocations. When calculating the water allocation requirements for a specific irrigated crop based on the historical data, the use of the median value of 426mm/year is recommended to be used, as this will represent the midpoint of annual total rainfall in the past 57 years.⁵ The average rainfall for the region is low and is likely to be insufficient for viable dry land crop production to occur in at least half of the years.

Engagement with Council has confirmed that the region experienced extremely low water levels in 2013 with no sufficient rainfall occurring at all. Council was required to consider implementing ‘extreme’ measures to supply water to the town including using satellite pumps to retrieve water from deeper parts of the lakes, paying for water to be transported in or having to move people out of the city.

4.2.4 Climate change

This section considers the historical climate data in the Mount Isa region and assesses the potential risk and impact it could have on crop management. Climate change is primarily linked to the increasing amounts of greenhouse gases in the atmosphere trapping heat, warming the air and oceans. This often leads to changes in air temperature, soil quality, humidity and rainfall causing heatwaves and extreme weather events.

BOM provides a range of predictive maps of the expected changes to climate across Australia. Figure 8 illustrates the predicted changes in rainfall and air temperature in Australia.

⁴ Australian Government, Bureau of Meteorology, 2024. *Monthly rainfall, Mount Isa Aero*. Accessed at: http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_type=dataFile&p_startYear=&p_c=&p_stn_num=029127.

⁵ Ibid.

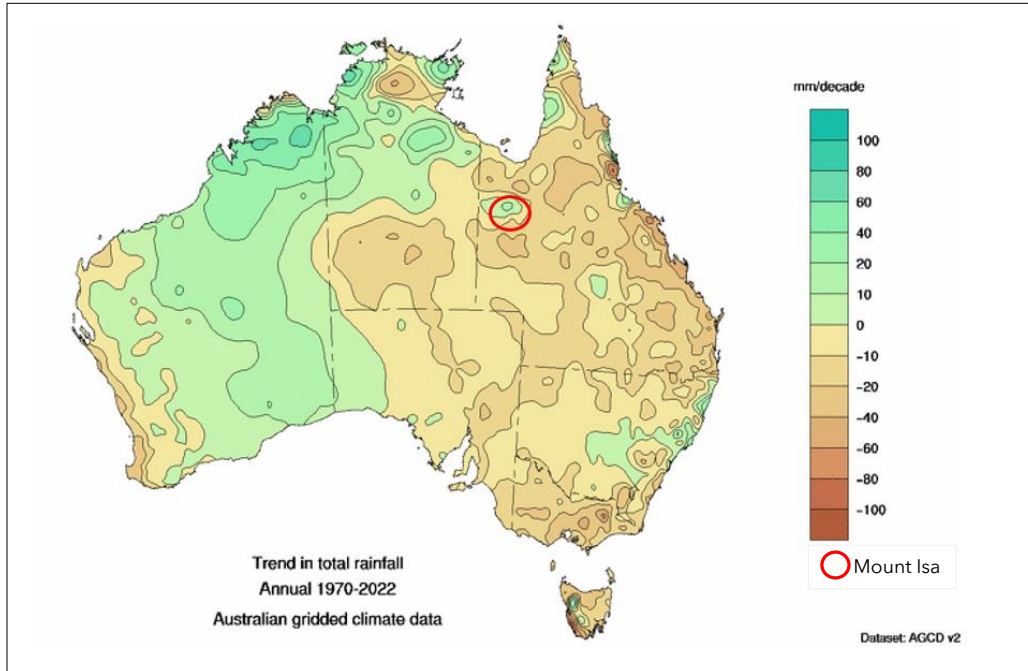


Figure 8: Climate change map - trend in total rainfall

Figure 8 depicts Mount Isa’s unique weather pattern in comparison to the surrounding areas. It indicates that the region will be impacted by an expected increase in rainfall of approximately 10 - 20 mm per decade, however the surrounding areas will be impacted by an expected reduction in rainfall of approximately 20 - 40 mm per decade. Over a 30-year period, the rainfall in the Mount Isa region may increase by 30 - 60mm with the surrounding areas potentially reducing their rainfall by approximately 60 - 120mm. This expected change in rainfall is a critical factor to consider in investigating potential medium to long-term projects, particularly for crops that take several years to reach maturity and maximum yield.



This forecast change in rainfall is supported by a review of the historical data for the past 57 years, as shown in Figure 9, showing a trend of a moderate increase in annual rainfall over this period.

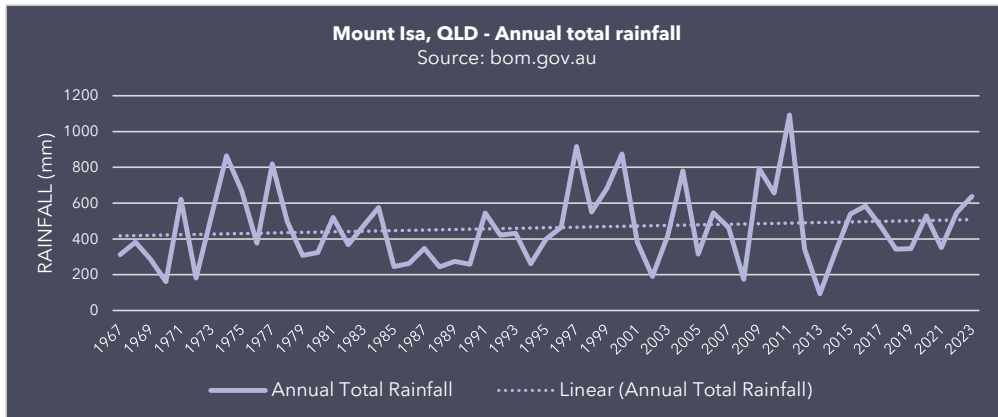


Figure 9: Historical trend in rainfall for Mount Isa

Figure 9 shows a slight upward trend of approximately 20mm per decade or approximately 120mm since 1966, which is in-line with the BOM prediction. However, 57 years is a relatively medium-term timescale to consider the full effect of rainfall cycles and the predicted future impact of climate change in this region. The effect of climate change can lead to variable annual rainfall and unpredictable weather patterns, even if the overall average rainfall remains unchanged.

Figure 10 illustrates the BOM predictive map for the increase in the maximum temperature caused by climate change.

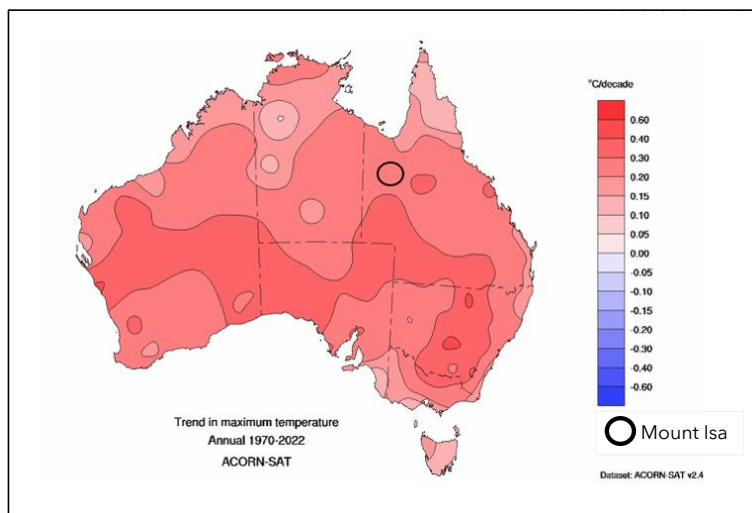
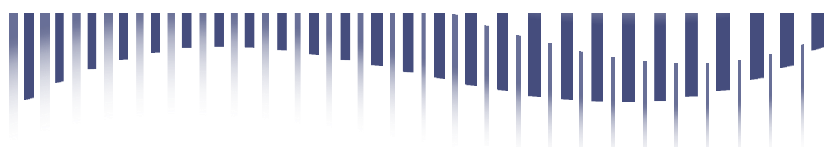


Figure 10: Climate change map - trend in maximum temperature

Figure 10 indicates that the region will be impacted by an increase in the maximum temperature of approximately 0.3 - 0.4°C per decade. Based on the aforementioned review of air temperature in Section 4.2.1 and this prediction,



the number of days per year with temperatures in the 35 - 40°C range is likely to increase from the historical average of 127 days per year. The number of days $\geq 40^\circ\text{C}$ will also likely increase from the historical average of 22 days per year.

A predicted increase in maximum temperatures will influence the types of crops that are considered suitable for the region as well as the likely increase in requirement for water (rainfall or irrigation). In reviewing the historical data for the past 57 years, as shown in Figure 11, the trend is showing a slight increase in the highest temperature over this period.

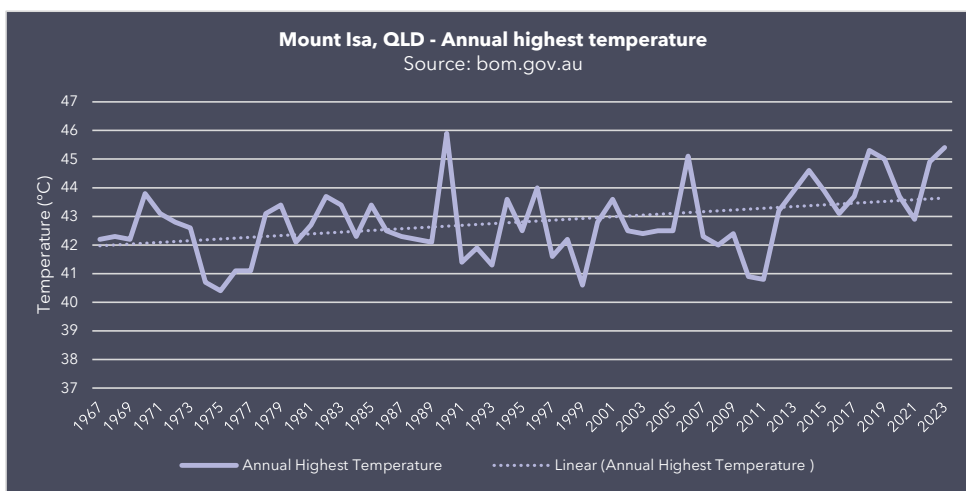


Figure 11: Historical trend in highest temperature for Mount Isa

The linear trend in Figure 11 shows an upward trend of approximately 0.2°C per decade or 1.6°C over the past 57 years. This increase in maximum temperature is broadly in line with the government predictions for the Northwest Queensland region.⁶

BOM and CSIRO’s climate change data predict that there is likely to be a substantial increase in the temperature reached on the hottest days, and an increase in the frequency of hot days and the duration of warm spells.⁷ These high temperatures are consistent year on year, therefore any increases will influence the management of certain crops and subsequent water usage requirements.

From a minimum temperature perspective, BOM predicts an increase in the minimum temperature of approximately 0.2 - 0.3°C per decade. Over a 30-year period, the minimum temperature in the Mount Isa region may increase by 0.6 - 0.9°C. Figure 12 shows a slight downward trend in annual minimum temperatures of approximately 0.01°C per decade or 0.1°C over the past 57 years since 1966.

⁶ Queensland Government, 2019. *Climate Change in the North West Queensland region (Version 1)*. Accessed at: https://www.qld.gov.au/_data/assets/pdf_file/0029/68366/north-west-qld-climate-change-impact-summary.pdf.

⁷ Ibid.

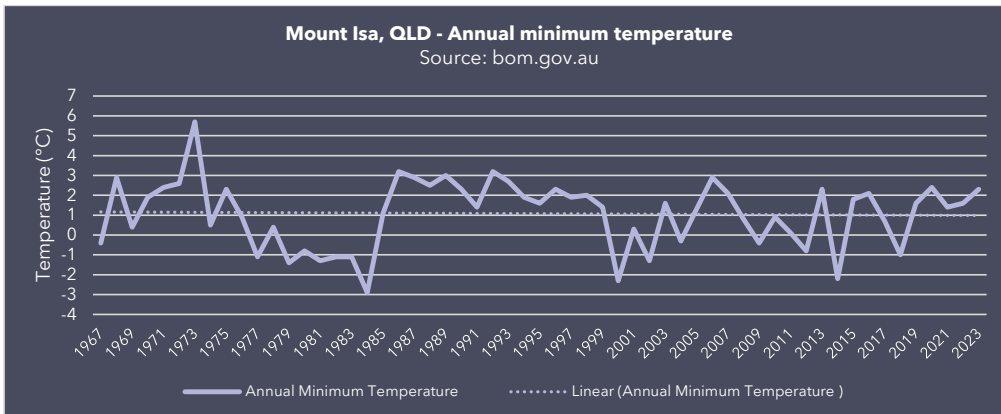
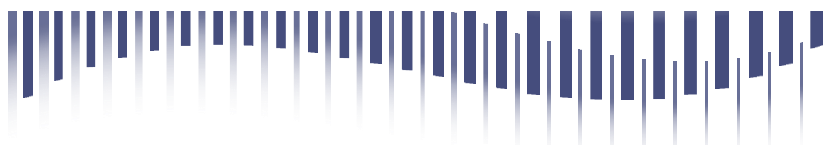


Figure 12: Historical trend in lowest temperature for Mount Isa

This slight decrease in minimum temperature contrary to the BOM predictions with the number of days per year with temperatures at or below 2°C not likely to change based on historical trends. Frost mitigation strategies may be required to be considered for some crops; however, frost events rarely occur within Mount Isa due to its location and topography.⁸

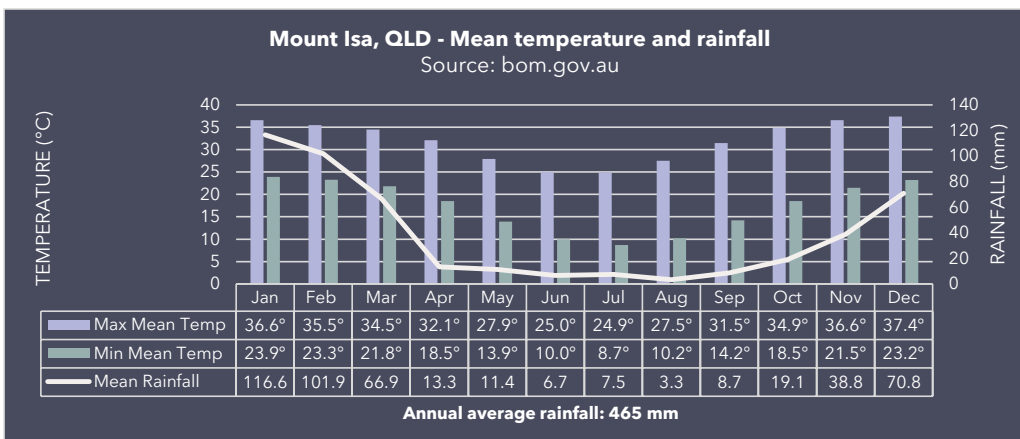


Figure 13: Mount Isa mean temperature and rainfall

Figure 13 summarises the mean temperature and rainfall that occurs within the Mount Isa region. The hottest months of the year occur between October to March which correlates with the high rainfall months occurring in the summer between November to March. Throughout May to August, during the winter season the temperature cools off significantly with minimal rainfall occurring.

Overall, the region has experienced significant levels of variable rainfall and temperatures leading to extreme weather events, including drought. The droughts experienced in this region can be harsh and long-lasting as the chance of high rainfall occurring typically happens within a four to five-month window. As a consequence of the drier conditions, soil moisture levels are reduced leading to decreased forage production, surface coverage,

⁸ Australian Government, Bureau of Meteorology, n.d. *Climate of Mount Isa*. Accessed at: http://www.bom.gov.au/qld/mt_isa/climate.shtml



carrying capacities for livestock, and animal output, whilst also causing major changes in the composition of plant and animal species.⁹ Consequently, this puts a lot of strain on the local community and regions which comprise predominantly of beef graziers where changing climate conditions and seasonal weather conditions heavily influence their businesses and livelihoods.

4.2.5 Weather conditions summary

In summary, the Mount Isa region has high temperatures, low humidity and low rainfall, which is further exacerbated by the effects of climate change. This can create a barrier in relation to agricultural practices, as higher temperatures create higher evaporation within soil, while at the same time increases the water uptake required by plants and animals to remain healthy.¹⁰ Due to this, and combined with low humidity and low rainfall within the region, temperature control and mitigation practices will need to be considered when investigating what agriculture would be suitable and successful for Mount Isa.

4.3 Soil suitability

Soil types are differentiated according to the Australian Soil Classification system (ASC), which is used to describe and classify soils within Australia. Across Queensland, there are a variety of different soil orders present, including vertosols, ferrosols, dermosols, chromosols, kurosols, kandosols, sodosols, calcarosols, rudosols, tenosols, podosols, hydrosols and organosols. Soils within each order are grouped according to similar chemical, physical and biological properties.¹¹ This section presents the soil orders present in Mount Isa.

4.3.1 Soil profile

The soil within and around the Mount Isa region is mostly made up of rudosols (on ridges) and ferrosols (in valley bottoms). Specifically, all types of soil orders found in the region are specified within Table 3.

Table 3: Mount Isa soil profile

Soil class	Description	Agricultural potential
Chromosols	These soils are considered texture-contrast soils, meaning that the texture of the soil is different at the surface (horizon A) to what it is in the subsoil (horizon B) (refer to Figure 14). Surface soil is loamy soil, while the subsoil is clay. It is non-sodic and has slightly acidic to slightly alkaline clay subsoil. It has little to no expansive clays and is not generally dispersive. ¹²	Moderate agricultural potential due to their moderate chemical fertility and water-holding capacity. ¹³

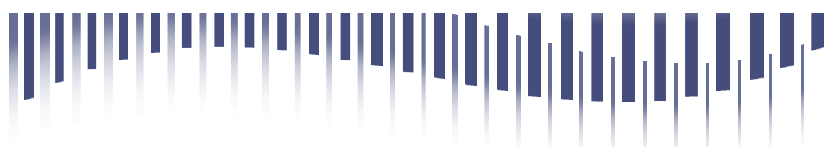
⁹ Queensland Government, 2019. *Climate Change in the North West Queensland region (Version 1)*. Accessed at: https://www.qld.gov.au/__data/assets/pdf_file/0029/68366/north-west-qld-climate-change-impact-summary.pdf.

¹⁰ Australian Government, Bureau of Meteorology, n.d. *Risk Management and Temperature*. Accessed at: <http://www.bom.gov.au/wat/about-weather-and-climate/risk/risk-temperature.shtml#:~:text=In%20the%20longer%20term%2C%20above,temperatures%20at%20key%20development%20stages>.

¹¹ Queensland Government, 2023. *Common soil types*. Accessed at: <https://www.qld.gov.au/environment/land/management/soil/soil-testing/types>.

¹² GHD Pty Ltd, n.d. *Geology and Soils, Volume 2 Chapter 6*. Accessed at: <https://eisdocs.dsdp.qld.gov.au/CopperString/2019/dEIS/Volume-2-Chapter-6-Geology-and-soils.pdf>.

¹³ NSW Government, n.d. *Soil types*. Accessed at: <https://soilsnearme.app/info/1001>.



Soil class	Description	Agricultural potential
Ferrosols	Well-drained soils, coloured red or yellow-brown, that lack texture contrast and have a high clay content. Soils are high in free iron oxide in the subsoil (B horizon soil layer) resulting in a stable and strong structure. ¹⁴	High agricultural potential due to their good structure and moderate to high chemical fertility and water-holding capacity. ¹⁵
Kandosols	Red, yellow and grey solid soils with sandy to loamy surface soils and porous sandy-clay subsoils, consisting of a chemical makeup of neutral to acidic, with very low salt levels. These soils are porous and friable, do not have shrink-swell clays, and are generally not dispersive. ¹⁶	Low to moderate agricultural potential, with low fertility and poor water-holding capacity. ¹⁷ Where rainfall is higher, or where irrigation is available, a range of crops can be grown on these soils. Kandosols also support sheep and cattle grazing on native pastures. ¹⁸
Rudosols	Deep layered alluvial/stratic soils or shallow soils containing large amounts of rock fragments. These soils typically have low salt levels, and low shrink-swell capacity (expansive clays). ¹⁹	Generally, have low agricultural potential due to low fertility, and low water-holding capacity. ²⁰

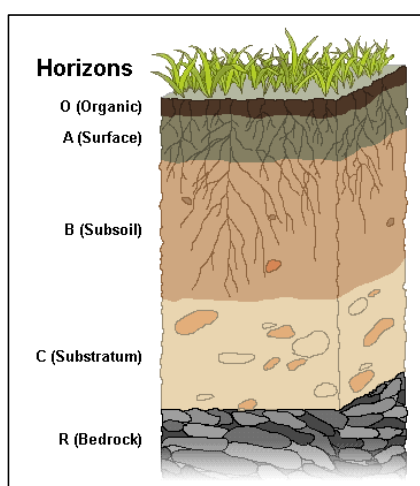


Figure 14: Soil Horizons²¹

4.3.2 Soil Summary

Of the four soil types found within the region, areas with chromosols and ferrosols will be more favourable for crop production. Areas with kandosols and rudosols are less favourable, as they have low to moderate agricultural

¹⁴ GHD Pty Ltd, n.d. *Geology and Soils, Volume 2 Chapter 6*. Accessed at: <https://eisdocs.dsdip.qld.gov.au/CopperString/2019/dEIS/Volume-2-Chapter-6-Geology-and-soils.pdf>.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ NSW Government, n.d. *Soil types*. Accessed at: <https://soilsnearth.app/info/1001>.

¹⁸ Queensland Government, 2023. *Common soil types*. Accessed at: <https://www.qld.gov.au/environment/land/management/soil/soil-testing/types>.

¹⁹ GHD Pty Ltd, n.d. *Geology and Soils, Volume 2 Chapter 6*. Accessed at: <https://eisdocs.dsdip.qld.gov.au/CopperString/2019/dEIS/Volume-2-Chapter-6-Geology-and-soils.pdf>.

²⁰ Queensland Government, 2023. *Common soil types*. Accessed at: <https://www.qld.gov.au/environment/land/management/soil/soil-testing/types>.

²¹ Plantlet, 2024. *Soil horizons development and soil profile*. Accessed at: <https://plantlet.org/soil-horizons-development-soil-profile/>.



potential due to their low fertility and water-holding capacity, however, these areas can be made conducive to crop production with irrigation, if soil depth (rooting depth) is adequate. The quality of these less fertile soils could also be improved by applying phosphate to improve soil quality (refer to section 3.5.1).

4.4 Water

4.4.1 Introduction

The types of soil found in Mount Isa and the weather that is experienced throughout the year in the region makes the reliability and supply of water a critical element in supporting agricultural practices. As the average rainfall for the region is low, and there is a growing concern every summer of drought events occurring, Mount Isa will need to consider investment in alternative water sources to ensure the sustainability of future agricultural activities. As recently as 2013 Mount Isa faced significant stored water shortages, with Lake Moondarra going below 30% capacity, and Lake Julius going below 70% capacity, uncharacteristic lows in both instances²².

The closure of the Glencore copper mine will lead to an increased availability in water from Lake Moondarra that could be used for agricultural initiatives if a commercial agreement can be reached with any proponent. This could also be supplemented by underutilised allocations held by MICC, subject again to a commercial agreement between interested parties. Mount Isa, serving as the hub for most economic activity in the region, is also the hub for stored water distribution, with both Lake Julius and Lake Moondarra falling in the Mount Isa LGA.

4.4.2 Water planning in the Mount Isa region

Water plans are developed under the Water Act 2000 to sustainably manage and allocate water resources in Queensland. The water plan may apply to rivers, lakes and springs, overland flow and underground water. Water plans are tailored to each catchment area to balance the needs of water users (e.g., towns and industries) and the environment²³. The stages in the water planning process are outlined below in Figure 15.



Figure 15: Water planning process

²² ABC, 2013. *Mount Isa may face tougher water bans*. Accessed at: <https://www.abc.net.au/news/2013-10-24/mount-isa-may-face-tougher-water-bans/5042690>.

²³ Business Queensland, 2023. *Water planning framework*. Accessed at: <https://www.business.qld.gov.au/industries/mining-energy-water/water/catchments-planning/planning>



The two water plan areas of significance to Mount Isa are the Georgina and Diamantina water plan area to the south and the Gulf water plan area to the North as shown below in Figure 16.



Figure 16: Water plan areas surrounding Mount Isa

4.4.3 Georgina and Diamantina catchment

As of 29 April 2024, the Georgina and Diamantina water plan is under review, and will be replaced. Stakeholder consultation to inform this review is currently open. The current plan was implemented in 2004 and is set to expire on 16 August 2024.

The water plan applies to the following water sources in the relevant geographical area:

- existing surface water users
- future surface water users
- the environment
- water in a watercourse, lake or spring (except those connected to artesian water)
- overland flow water (overland flow water is water that flows on the surface of the land but not within a defined watercourse, e.g., floodwater, surface sheet flow, etc.); and
- hydraulically-linked sub artesian water (hydraulically-linked sub artesian water is underground water that requires pumping to the surface from a bore located within or adjacent to a watercourse - a formal definition is provided in the water resource plan).



Of particular note for the agriculture sector the plan does not affect any user's rights to take riparian water for stock and domestic purposes from a watercourse that adjoins their property.

Government policy has determined that unallocated water will be released through a market-based process. Depending on the type of water, this will be either through a tender, a fixed price, or an expression of interest. Up to 13.5 GL of unallocated water is available for future use in the Georgina and Diamantina catchments. This is made up of 12 GL of water for any purpose and 1.5 GL reserved for projects of state significance. A project of state significance is defined under the State Development and Public Works Organisation Act 1971. Examples can include - the construction of major public dams, mines, bridges and tunnels, gas pipelines, etc. Generally, they are large scale projects that have a significant benefit for the state and must undergo rigorous assessments.

Landowners, governments, companies, and other entities can apply for water licences to take unallocated water as long as they own land or have a registered lease within the Queensland part of the catchment²⁴.

To ensure compliance with water planning legislation, consultation with DRDMW is recommended ahead of prospective agricultural projects which may have need to access regulated water sources.

4.4.4 Gulf catchment

The Gulf water plan area is a region of major industry growth with increasing demands for water to support new irrigated agriculture and need to access critical minerals (such as copper, vanadium and tungsten). Each year, almost 25,000 GL of water from the area flows into the Gulf of Carpentaria to support economic and environmentally significant fisheries.

Right now, the main uses for water in the water plan area are the small-scale irrigation industry, mining activity in the Mount Isa area and urban use. Other water uses with a social, economic, or cultural value include recreational and commercial fisheries in the Gulf of Carpentaria and a growing tourism industry.

The Gulf water plan sets the rules for allocation and use of:

- water in watercourses (rivers, streams, creeks etc), lakes and springs
- overland flow water; and
- groundwater.

The Gulf water plan is also currently under review, with public submissions to the review closing on 17 July 2024. To ensure compliance with water planning legislation, consultation with DRDMW is recommended ahead of prospective agricultural projects which may have need to access regulated water sources.

Watercourses

Most entitlement holders in the Gulf take their water directly from the watercourses. This is called unsupplemented water use. In this region, the highest amount of unsupplemented surface water entitlements come from the Flinders River water management area. This is followed by the Lower Leichhardt River sub catchment and the Gilbert River water management area (see map of the Gulf catchments and sub catchments). Unsupplemented water licences within the Gilbert River and Flinders River catchment areas are regulated as metered entitlement areas. This means that entitlement holders in these areas must have a valid water meter to measure their water take.

There are two major dams-Moondarra Dam and Julius Dam-that supply supplemented water for urban use and mining activity. These dams are a part of two water supply schemes:

²⁴ Business Queensland, 2023. *Water plan areas*. Accessed at: <https://www.business.qld.gov.au/industries/mining-energy-water/water/catchments-planning/water-plan-areas>



- the Moondarra Dam water supply scheme managed by the Mt Isa Water Board
- the Julius Dam water supply scheme owned and operated by Sunwater.

Overland flow

Overland flow is water that runs across the land after rainfall, either before it enters a watercourse, after it leaves a watercourse as floodwater, or after it rises to the surface naturally from underground.

The Gulf water plan regulates the taking of overland flow water by limiting the volume capacity of any new storage, such as a dam or water tank (called 'new works' in the water plan).

The rules for building storage to capture water do not apply if:

- it is for stock or domestic use
- it is under 250ML (any purpose)
- it is to satisfy the requirements of an authority under the *Environmental Protection Act 1994*.

Groundwater

In some parts of the Gulf, groundwater is closely connected to surface water. Because they're so closely interconnected, they are managed by the Department in the same way.

Any water user drawing from an aquifer that is under or within 1km of a declared watercourse will require a water licence to take water. This rule does not apply for water used for stock or domestic purposes²⁵.

4.4.5 Lake Moondarra

Lake Moondarra is owned by Mount Isa Mines Glencore, located on the Leichardt River, approximately 16km downstream from Mount Isa township. The dam has a catchment area of 1.070 km² and a storage capacity of 106.833 gigalitres (GL). Construction of Moondarra Dam was completed by Mount Isa Mines in 1958 to supply water to the town and surrounding mines. There is a total of 26.3 GL per annum (GL/a) of medium priority water allocations available from the Moondarra Dam water supply scheme (WSS), including 1.25 GL/a to cover distribution losses, and no high priority water allocations²⁶. This 26.3GL is fully allocated to existing customers between Mount Isa Mines, the MIWB and MICC. Although Lake Moondarra is completely allocated, it would preclude a potential commercial agreement for a sub-allocation of underutilised water.

Since Moondarra Dam is located closer to Mount Isa and Mount Isa Mines than Lake Julius, there are lower operational costs when accessing water from this dam. MIWB therefore typically operates the water supply system with preferential take from Moondarra Dam to supply its customers²⁷.

During stakeholder consultation sessions, representatives from Glencore outlined that they have a 12.5GL/a water allocation in Lake Moondarra, of this they use approximately 8GL/a. Current estimates (which may be subject to change based on planned initiatives by Glencore) are that their usage will decrease to approximately 6GL/a after the mine closure. Glencore is welcoming of any commercial arrangement to utilise this available water, as it is their intention to continue operating Lake Moondarra.

²⁵ Department of Regional Development, Manufacturing and Water, 2024. *How we manage water in the Gulf*. Accessed at: <https://www.rdmw.qld.gov.au/water/consultations-initiatives/gulf-water-plan-review/how-we-manage-water-in-the-gulf>

²⁶ Department of Natural Resources Mines and Energy, 2019. *Mount Isa Regional Water Supply Security Assessment 2019*. Accessed at: https://www.rdmw.qld.gov.au/_data/assets/pdf_file/0003/1466670/mount-isa-nwssa.pdf.

²⁷ Ibid.



4.4.6 Lake Julius

Lake Julius is owned by Sunwater and is also on the Leichhardt River. It is located 74 km downstream of Moondarra Dam, approximately 70 km north-east of Mount Isa township. The dam has a catchment area of 3,730 km² and a storage capacity of 107.5 GL. Construction of Julius Dam was completed by Sunwater in 1976 to augment the water supply from the Moondarra Dam Water Supply Scheme. There are a total of 48.85 GL/a of high priority water allocations available from the Julius Dam WSS, including 1.25 GL/a to cover distribution losses, and no medium priority water allocations²⁸.

Water is generally sourced from Julius Dam by MIWB only when water levels in Moondarra Dam fall below about 25% of its storage capacity, or when water quality issues may impede the use of water taken from Moondarra Dam. Sunwater supplies water from Julius Dam to its own customers and to customers of its wholly owned subsidiary, North West Queensland Water Pipeline Pty Ltd. This subsidiary company supplies water to Ernest Henry Mining through the North West Queensland Water Pipeline and also supplies water to Cloncurry via the Cloncurry Pipeline²⁹. As at 2018 North West Queensland Water Pipeline Pty Ltd held 15 GL/a of HP water allocation, of which around half was uncommitted.³⁰

4.5 Potential site identification

Site identification is a crucial consideration for each of the crop production options when considering their potential viability within the MICC region. Subject to the type of opportunity pursued and thereby the amount of land required, four potential sites or areas in, and around, the MICC region have preliminarily been identified in consultation with MICC, its stakeholders and the local agricultural industry. MICC has also independently assessed other potential sites within a 50km radius of the LGA. This potential site identification review does not investigate the likely challenges related to site establishment for future agricultural projects, such as the challenges of rights to develop land, impact on existing user, logistical access to land, access to power and land use arrangements. The process of the identification of potential irrigated farming sites will need to be ongoing and require the local landholders to be engaged in the process. Large areas of arable land suitable for irrigated crop production in the MICC LGA are not a common feature of the region.

The key considerations applied in the site identification process are included in Table 4.

Table 4: Site identification considerations

Site identification topic	Consideration
Land topography	The land for irrigated crop production needs to be relatively flat while also having low risk of inundation from proximate water sources and risk of flooding.
Water availability	The site would ideally be proximate to water source or have access to on-property water. The arrangements around water allocations and licences may also be considered should the current landholder be an existing allocation holder.
Soil quality	There is a detailed process for testing and confirming acceptable soil quality for the preferred site, including confirming the depth of A horizon and understanding the conditions of B horizon soil.

²⁸ Department of Natural Resources Mines and Energy, 2019. *Mount Isa Regional Water Supply Security Assessment 2019*. Accessed at: https://www.rdmw.qld.gov.au/_data/assets/pdf_file/0003/1466670/mount-isa-rwssa.pdf

²⁹ Ibid.

³⁰ Ibid.



Site identification topic	Consideration
Land tenure	This relates to the ownership arrangements of the existing landholder such as leasehold, freehold or occupation licences. There are also potential native title issues to consider as part of the site identification process.
Land size	The land size is unlikely to be confirmed prior to confirming the type of opportunity pursued. However, for the purpose of this site identification process, the land must be at least 1,000 ha in a single location to utilise the available water allocation efficiently.
Proximity to Mount Isa LGA	Given the parameters of the Queensland Government's funding program, the site would ideally be within the Mount Isa LGA, or in proximity to the region so that local Mount Isa LGA population may benefit from the proposed opportunity.

4.5.1 Soil quality

As outlined in section 3.3 The soil within and around the Mount Isa region is mostly made up of rudosols (on ridges) and ferrosols (in valley bottoms), as well as some instances of kandosols and chromosols. Of these four soil types found within the region, areas with chromosols and ferrosols will be more favourable for crop production. Areas with kandosols and rudosols are less favourable, as they have low to moderate agricultural potential due to their low fertility and water-holding capacity, however, these areas can be made conducive to crop production with irrigation, if rooting depth is adequate.

The quality of these less fertile soils could also be improved by applying composts or organic manure products, soil ameliorants and essential macro and micronutrients to improve soil quality and suitability for high production irrigated crops. Phosphorous is another major nutrient for plant life, it is a constituent of plant cells and essential for cell division and growth³¹. The phosphorous production by Incitec Pivot in the Mount Isa region is a comparative advantage for the agriculture sector. The *North West Queensland Economic Diversification Strategy Implementation Plan 2025* also identifies securing sulphuric acid supply as a key action, in order to aid the fertiliser manufacturing process for the agriculture industry. Currently sulphuric acid is a byproduct of mining / smelting works in the area and is therefore at risk in response to the shutdown of mining operations. While soil quality can expect to see marginal improvements with the right combination of added nutrients, these additions are not sufficient to completely transform the nature of the soil over a broad area.

The soils within the LGA are predominantly rudosols, red loam soils (characterised by a mixture of sand, silt and clay) with an abundance of small to large rocks being present. Soils with rocks are not considered suitable for irrigated crop production due to challenges with cultivation and land preparation, root development and crop management.

Ideal soils for irrigated crop production comprise the following qualities:

- A horizon with friable soil structure that will promote healthy root growth
- Depth of a horizon that meets the root depth required by the crop being grown (500 - 1,000mm)
- Absence of nutrient toxicities such as sodium, chloride, or boron; and
- A minimum of 75-100mm of water holding capacity.

³¹ NSW Department of Primary Industries, 2024. *Why phosphorous is important*. Accessed at: <https://dpi.nsw.gov.au/agriculture/soils/more-information/improvement/phosphorous#:~:text=Phosphorus%20is%20one%20of%20the,for%20seedlings%20and%20young%20plants>.



4.5.2 Land size

A minimum land area is also required to ensure that any irrigated cropping operation is viable. Also, if water delivery infrastructure is required, for asset efficiency, it is necessary to ensure that there is sufficient suitable land in an area to utilise most or all of the expected available water allocation. Based on the potential available water allocations from Lake Moondarra, an irrigated farming area of approximately 1,000ha would be required, preferably in a single location. Based on average annual irrigation water demand across a range of crop types, 1000 ha would require a total annual allocation of 10GL.

4.5.3 Proximity to Mount Isa LGA

To ensure that a prospective project delivers economic benefits to the Mount Isa region, it is desirable that the project site be close to, or within the Mount Isa LGA. Mount Isa is acknowledged as a major hub for the regional northwest, which allows for an expanded scope as any project in the broader region is likely to result in increased economic activity in Mount Isa.

The challenge of this constraint is that the areas within and immediately surrounding the Mount Isa LGA often exhibit less than desirable soil and climatic conditions as outlined in section 3.2 and 3.3.

4.5.4 Land tenure

In addition to other site considerations, it will also be necessary to ensure that prospective sites, and landholders, are subject to the appropriate land tenure regulations. Stakeholder consultation has identified that local graziers have inconsistent rights to the land on which they live and operate their business. There are a number of land tenure types under Queensland law, which can be broadly categorised as Leases, Permits to occupy, Licenses and Trust land.

The most relevant land tenure types for graziers or prospective cropping opportunities in Mount Isa are term leases, perpetual leases, freehold leases and occupation licenses³².

- **Term leases:** Term leases expire at the end of the last day of the lease term, and the leaseholder loses possession of the land. Any improvements on the land become the property of the state, unless otherwise stated in the conditions of the lease.
- **Perpetual leases:** These leases are held by the leaseholder in perpetuity (not for 99 years as commonly believed) and issued for a specific purpose (e.g., agricultural or commercial). Perpetual leases must only be used for the purpose for which the lease is issued.
- **Freehold leases:** A freeholding lease is issued when a landholder is able to elect to pay the purchase price for their lease in instalments over a number of years. On receipt of the final instalment, the lease is converted to freehold.
- **Occupation licenses:** An occupation licence is a licence to occupy unallocated state land. Although the Land Act 1994 makes no provision for the issue of an occupation licence, previously existing licences have been continued under this Act. No term applies to the licence, which may be cancelled at any time and no compensation is payable. The State must approve all improvements or development work the licensee wishes to undertake.

³² Queensland Government, 2022. *Types of land tenure*. Accessed at: <https://www.qld.gov.au/environment/land/state/use/tenure/leases>



The type of land tenure applicable to a farmer will have relevance on the amount and type of investment they are willing to make in that land (i.e., if a farmer has a relatively unsecured land tenure, they would be unlikely to consider significant infrastructure or other investment due to the risk that land may be reclaimed for other purposes).

Stakeholder engagement also identified that many farmers are also concerned with native title claims over land that they currently occupy. Anecdotally, it did not appear that many farmers were engaged in a meaningful dialogue with traditional owners from the Mount Isa area.

4.5.5 Site Options for Irrigation Land

Through consultation with Council and its stakeholders, potential site options have been identified for future potential irrigated land operations, as shown in Figure 17.



Figure 17: Potential irrigation land sites

There are two locations close to Lake Moondarra that have been identified as potentially having small areas (<50ha) that may be suitable for irrigated crop production. The proximity of these areas to the lake will reduce the cost of water delivery infrastructure and may provide an opportunity for trial sites/small commercial production to be setup.

There are two sites to the west of Lake Moondarra on the grazing property "May Downs" that may provide circa 1,000ha of irrigatable land in a single area. These areas are 15 - 30km from the lake and would require investment in water delivery infrastructure to deliver water to these locations. MICCC has also independently assessed other potential sites within a 50km radius of the LGA.

Note that the areas outlined above in Figure 17 represent indicative spaces where suitable land may be found. While some preliminary estimates have been outlined above, productive agricultural projects may be viable on smaller plots of land, depending on the nature of the opportunity. Outlined in Figure 17, the approximate size of sites identified from left to right is 3000ha, 2000ha, 500ha and 700ha respectively.

Further assessment of all potential irrigation sites is required along with landholder engagement to qualify these locations as being suitable for irrigated crop production.



Preliminary site assessment

Following the identification of potential land areas that may have suitable soils, a preliminary site assessment is required. This assessment does not need to be a detailed soil survey and can be conducted in the following approach:

- **Map** potential area using Google Earth or similar software to look for major trends in soil type, vegetation cover etc.
- **Identify** assessment sites with 2-4 locations per 100ha being chosen.
- At each assessment site, using a backhoe or similar **dig a hole/trench** to 1.0 - 1.5m or until bedrock is reached.
- **Assess the soil profile** for the following physical characteristics:
 - Presence or absence of rock through the profile, noting the size and abundance of rock fragments.
 - Depth of a horizon
 - Friability of the soil
- If the soil profile has physical characteristics that suit crop production, collect the following samples for soil analysis:
 - 500g soil sample from the 0 - 300mm depth range
 - 500g soil sample from the top section of the B horizon
- Have the soil samples **analysed for their chemical composition** to assess for nutrient deficiencies, imbalances or toxicities.

It would be advisable for an agronomist with soils and irrigated crop production experience to be present during the preliminary site assessment.

The preliminary assessment approach, to be conducted in the next phase of investigation, will enable potential areas to be assessed relatively quickly as being potentially suitable or not. This will ensure that detailed assessments are only conducted at sites that have a reasonable opportunity of being suitable for irrigated crop production.

4.6 Environmental approval processes

The Environmental Impact Statement (EIS), which is a statutory requirement, set out the matters that the proponent was required to address to allow approval by State Government agencies. For any agricultural development in Mount Isa, the scope might be reduced or increased, however the work to be carried out for environmental approval processes may include:

- **Native vegetation:** A permit to remove native vegetation is required in Queensland and a detailed survey of the site is required. Over the last 20 years, there has been several reversals of this policy, however the present Government will only permit native vegetation clearance if the project is what is declared a 'Coordinated Project' under DSDI. A detailed EIS would be required as part of the application process.
- **Environmental values:** The environmental values that need to be protected need to be identified, baseline information provided to assess impacts and then detailed strategies be provided for protection and enhancement of the environmental values. The EIS needs to show how the project meets the policy statutory and regulatory requirements for local state and federal governments.



- **Project description and site description:** A detailed Project description including capital expenditure and construction staging is to be provided along with a site description providing comprehensive survey, topographical, soils management and plans of the drawings with all this related to potential environmental impacts.
- **Construction and operations:** Detailed information is to be provided on preconstruction e.g., vegetation clearing then description of infrastructure to be built, methods of construction, and programming. Detailed information is also required for operations.
- **Water resources:** The EIS is required to show the impact on water resources including maintenance of environmental flows, impacts on water quality and the maintenance of habitat diversity and existing ecology and to show how existing water users are not affected adversely. Proposals need to be provided to show how the Gulf Resources Operation plan's environmental flows are maintained. Full details of all water demands are to be provided.
- **Hydrology - Diversion and storage:** Detailed information is required on hydrology and on all infrastructure used to collect a manage store water. Groundwater impacts are to be modelled along with water quality impacts including those from discharges from the site.
- **Flora and fauna:** Treatment of flora and fauna matters needs to be based on detailed field studies and then a demonstration that the proposed development minimises the impact on biodiversity, natural environmental values, and ecological characteristics. This includes threatened species and ecological communities. Strategies of protection are to be provided along with proposals for buffer zones and if required offsets.
- **Land use and soils:** The proposals need to show how the proposed land uses impact on soils and minimised and how particular matters such as waterlogging salinity, sodicity and erosion are to be managed.
- **Other matters:** The EIS is also required to indicate potential impacts and how this impact might be managed in a diverse range of areas such as flooding and noise and vibration, social and economic, bio security, water management, Cultural Heritage existing infrastructure and transport and finally matters of national environmental significance.

4.7 Other considerations

4.7.1 Freight and logistics

The Mount Isa region has limited road and rail freight links that could be accessed to transport agricultural products (refer to Figure 18), which will impact the duration and cost of transportation, and the quality of produce transported.



Figure 18: The North-West Queensland region transport network³³

Roads

The agricultural industry within North-West Queensland relies heavily on the roads network to transport produce, due to the customisability of transportation duration, and truck volume and storage conditions.³⁴ Around the Mount Isa region, the road network consists of limited routes across a large area, with an average daily traffic volume on highways in 2019 recorded at 6,700 vehicles. Additionally, 50 per cent of road traffic on major freight routes (such as the Flinders and Barkly Highways) is made up of heavy vehicles.³⁵

Road standards vary across North-West Queensland which affect industry connections linking key production market and supply chains. Poor road conditions include narrow pavement widths, poor flood immunity, roughness and low bridge load limits. This is further exacerbated by the impact of flooding events, which affect road-safety and carrying capacity, and increases the need for repairs and maintenance. Furthermore, increasing agricultural activity within the area will increase road freight activity within the region, which will generate more challenges for road safety and road maintenance. The feasibility of new agriculture ventures within the Mount Isa region might depend in some cases on investment in road network improvements.³⁶

³³ Queensland Department of Transport and Main Roads, 2019. *North West Queensland, Regional Transport Plan*. Accessed at: <https://www.tmr.qld.gov.au/regionaltransportplans>.

³⁴ Cooperative Research Centre for Developing Northern Australia (CRCNA), March 2020. *Northern Australia Agriculture Investor Identification*. Accessed at: <https://crcna.com.au/resources/publications/northern-australia-agriculture-investor-identification-and-analysis-report>.

³⁵ Queensland Department of Transport and Main Roads, 2019. *North West Queensland, Regional Transport Plan*. Accessed at: <https://www.tmr.qld.gov.au/regionaltransportplans>.

³⁶ Ibid.



Access to rail

Access to the rail network from Mount Isa provides logistics and transportation opportunities for the region. It includes the Mount Isa line, which consists of over 1,000 kilometres of track that extends from Stuart (near Townsville) to Mount Isa. The Mount Isa line connects with the North-Coast line to link through to the intermodal facility at the Port of Townsville.³⁷ Currently, the rail network in Northern Australia is the main mode of transport used for freighting bulk minerals and is generally dominated by the mining industry. There is an opportunity to capitalise on the region's access to rail for the agricultural industry as currently, there are some challenges to transporting agricultural products due to freighting conditions.³⁸

Transportation of perishable horticulture

Given the location of Mount Isa in relation to major export hubs and markets, and the lack of road development outside of the major transport roads, the travel times for road and rail freight to Brisbane or Townsville from the Mount Isa region are lengthy which are not conducive for maintaining quality and freshness of highly perishable horticulture. Due to this, Mount Isa should invest in the growth of agricultural products that are not highly susceptible to high travel times, develop agricultural sites close to existing transport routes, and consider investment in the development of infrastructure at road and rail freight terminal points to store produce before transport.³⁹

Freight costs

The cost of freight for incoming and outgoing agriculture products is high for the Mount Isa region due to its location and proximity to exporting hubs and limited road networks. Although there has been investment in this area to try and reduce costs to Northwest Queensland through the Mount Isa Line Incentive Scheme, which began on 1 July 2019 and finished on 30 June 2023,⁴⁰ Mount Isa should consider what crops could be grown that can be used locally (circa 500km radius) as opposed to domestically, in order to make them a more feasible and profitable option.

4.7.2 Labour and skills

In Mount Isa there is currently a labour and skills shortage within the community, with over 1,500 job vacancies that have been present for several years. Factors impacting Mount Isa's ability to attract more workers include the lack of quality and affordable housing in the area, the high cost of transport, water and energy, and the infrastructure constraints within the community. These challenges are currently being addressed by the Mount Isa City Council and are outlined in the Mount Isa City Council Economic Development Strategy 2023-2028.⁴¹ Projections from the Glencore mine closure anticipate that a further 1,200 jobs will be lost as a direct result of the mine closure, with more than double this number in indirect jobs impacted because of lost economic activity. These direct job losses are coming from a high value industry, with average salaries ranging from \$115,000 to \$145,000, which is substantially higher than the national median salary of \$67,600⁴². Within the context of Agriculture pillar of the Mount Isa Economic Transformation project, the direct translation of these jobs to future agriculture initiatives poses a number of challenges. These challenges include retraining, competition (across industries), salary expectations,

³⁷ Queensland Department of Transport and Main Roads, 2019. North West Queensland, Regional Transport Plan. Accessed at: <https://www.tmr.qld.gov.au/regionaltransportplans>.

³⁸ Cooperative Research Centre for Developing Northern Australia (CRCNA), March 2020. *Northern Australia Agriculture Investor Identification*. Accessed at: <https://crcna.com.au/resources/publications/northern-australia-agriculture-investor-identification-and-analysis-report>.

³⁹ Alluvium, August 2022. *Strategic Assessment of Sustainable Agricultural Development Potential for Mitchell, Flinders, and Gilbert Catchments, completed for the Department of Regional Development, Manufacturing and Water and the National Water Grid Authority*.

⁴⁰ Queensland Government, 2023. *Mount Isa Line Incentive Scheme*. Accessed at: <https://www.tmr.qld.gov.au/business-industry/transport-sectors/freight/mount-isa-line-incentive-scheme#:~:text=The%20Mount%20Isa%20Line%20Incentive%20Scheme%20began%20on%201%20July,existing%20mining%20operators>.

⁴¹ SC Lennon & Associates Pty Ltd, n.d. *Mount Isa City Council Economic Development Strategy 2023-2028*. Accessed at: <https://www.mountisa.qld.gov.au/downloads/file/1985/economic-development-strategy>.

⁴² Australian Bureau of Statistics, 2023. *Employee hours and earnings Australia*. Accessed at: <https://www.abs.gov.au/statistics/labour/earnings-and-working-conditions/employee-earnings-and-hours-australia/may-2023>



work type and scale of agriculture opportunities. These factors will need to be explored further against specific initiatives during next phases of the project.

4.7.3 Low stocking ratios

Within the Mount Isa region, cattle land carrying capacity is limited to one animal per 10 to 20 hectares due to the inconsistent availability and poor quality of native pastures. Unimproved native pastures that are low in nutrient content are the main source of forage for cattle in the region, which means that livestock grazed in the region must consume a larger quantity of pasture than livestock produced in more fertile soil regions.

Additionally, the pasture that is available is of inconsistent supply throughout the year. In the wet season, pasture is generally of higher nutrient content and in greater supply, however, within the dry season, feed shortages are often prevalent due to decline in quality and supply. As a result, annual animal growth patterns typically follow a sequence of seasonal weight gains and weight losses which affects the ability of stock to reach different market weight for age specifications, as well as breeder reproductive performance and overall farm profitability.

To mitigate the impact of inconsistent availability and low nutrient content of pastures, feeding of energy and protein-enriched supplements (e.g., urea, molasses, cottonseed meal) to some or all stock classes is common. The use of hay as feed is also common.⁴³ This project has considered the potential of weaning earlier with supplementary feed weaners, via mini feedlots, to reduce grazing and breeder pressure. This would enable breeders to recover more quickly and increase calving rates.

4.7.4 Access to power

Due to Mount Isa's remote location, electricity is currently supplied to customers through the North West Power System (NWPS), which is not connected to the National Energy Market (NEM). As the region is not connected to the NEM, customers of the NWPS pay a higher delivered cost of electricity than similar energy users connected to the NEM.⁴⁴ Furthermore, the stable supply of electricity from the NWPS is challenging, due to its customer base. The NWPS services a customer portfolio characterised by a few very large customers (mining operations with large electricity demands) and two groups of various smaller customers (the towns of Mount Isa and Cloncurry). This results in an inconsistent demand for electricity in the NWPS (compared to the demand of electricity on a more diversified network), as episodes of excess electricity demand and excess supply of electricity occur, which can reduce system stability and impact supply to other customers. For example, if a mining customer starts up large facilities or, in some cases, large individual pieces of machinery, there can be significant increase in demand for electricity. Similarly, when these facilities/machines are shut down, there can be a sudden drop in demand and a consequential over-supply of electricity while the generators decrease their output.⁴⁵

There are plans to connect the Mount Isa region to the NEM through the CopperString 2032 project. The project is a 1,100 kilometre high-voltage electricity line from Townsville to Mount Isa that will connect Queensland's NWPS to the NEM and is expected to be completed by 2029.⁴⁶

Electricity for irrigation

Irrigation systems require a stable and reliable energy supply for pumping water. This can be a fuel operated or solar powered pump for a smaller irrigated area, however, for larger irrigated areas access to an energy network may be required. The demand for electricity for pumping is determined (per ML) by the head or pressure of the

⁴³ Alluvium, August 2022. *Strategic Assessment of Sustainable Agricultural Development Potential for Mitchell, Flinders, and Gilbert Catchments, completed for the Department of Regional Development, Manufacturing and Water and the National Water Grid Authority.*

⁴⁴ Ibid.

⁴⁵ Australian Competition and Consumer Commission (ACCC), 2015. *Determination, arrangements for participants in the North West Power System (NWPS) to agree to rules relating to the coordination of electricity dispatch schedules at electricity generations in the NWPS.* Accessed at: <https://www.accc.gov.au/system/files/public-registers/documents/D15%2B10765.pdf>.

⁴⁶ Queensland Government, 2023. *What is CopperString 2032 and why is it important for Queensland's renewable energy future?* Accessed at: <https://www.statedevelopment.qld.gov.au/news/what-is-copperstring-2032-and-why-is-it-important-for-queenslands-renewable-energy-future>.



system and the cost of the energy source. Irrigation energy demand is typically between 3kWh - 4.3 kWh per ML of water applied.

Due to the limited and unstable availability of electricity, currently, within the Mount Isa region, alternative sources of power may need to be considered for large scale irrigation, such as the development of windfarms or solar farms with battery storage.⁴⁷ Further research will need to be undertaken to understand the effect that the CopperString 2032 project will have for irrigation activities.

4.8 Summary

There are a broad range of considerations which must be considered to ensure the commercial viability of a prospective agricultural opportunity. Many of these relate to the natural environment in the Mount Isa region, however there are additional regulatory and commercial requirements which will impact decision making. Although there is an extensive list of considerations, the local, state and domestic agricultural communities bring a very high level of skill and knowledge to the industry, and have been successful in overcoming obstacles across a range of projects all around the country.

⁴⁷ Alluvium, August 2022. *Strategic Assessment of Sustainable Agricultural Development Potential for Mitchell, Flinders, and Gilbert Catchments*, completed for the Department of Regional Development, Manufacturing and Water and the National Water Grid Authority.



5 Strategic Framework

The response to the Glencore announcement is being coordinated under six pillars, to form a base economic strategy under the supervision of the Mount Isa Copper Mine Closure Taskforce (the Taskforce). This report concerns the “agriculture” pillar of the economic strategy. To provide strategic direction, and a framework for prioritisation and evaluation of current and future agriculture initiatives, a sub-strategy has been developed for MICC and the Taskforce with three strategic priorities.

5.1 Priority One: Strengthening the existing agriculture sector

The current state of agriculture in the Mount Isa region is characterised by a heavy concentration of grazing and cattle related activity. Mount Isa’s comparative advantage with other agricultural regions is an abundance of space, suitable for large scale grazing operations. Typically, operations in the Mount Isa region will focus on cattle breeding, weaning and stocking / backgrounding. The stocking rate in the region is comparatively low, and as such cattle are often taken east for fattening and downstream processing.

Because of the dominance of cattle in the local agricultural landscape, and the comparative advantages of the region, it is recommended that the first strategic priority for MICC should be activities that strengthen the grazing industry, either by removing barriers or enhancing comparative advantages. The opportunities which align to this priority are outlined in Table 5.

Table 5: Priority one opportunities

Opportunity category	Description	Specific opportunities identified in longlist
Forage crops & grazing support	<p>Forage crops are crops grown specifically to be grazed by livestock or conserved as hay / silage. Forage crops assist graziers in achieving production targets for cattle, such as weight gain, and can be a valuable tool in addressing seasonal shortfall between feed demand and supply (e.g., a lack of naturally occurring forage).</p> <p>This category also includes enabling infrastructure solutions that will assist in feeding cattle, and offer innovative solutions not currently implemented by the local grazing industry.</p>	<ul style="list-style-type: none"> • Irrigated Rhodes Grass • Irrigate Forage Sorghum • Irrigated Maize Silage • Dryland Forage • Bush Hay • Supplementary Cattle Feeding • On-farm mini feedlots

5.2 Priority Two: Diversifying the agricultural sector with new products or industries

The recent Glencore announcement has demonstrated the importance of a diversified economy, not only across sectors but also within. To this end, it is recommended that the second priority of MICC and the taskforce be to investigate new products are sub-industries which are appropriate to the climatic conditions of the Mount Isa, and can capitalise on the comparative advantages of the region.

The development of new agricultural products in the area comes with a range of challenges, especially due to the difficult climatic conditions of the region. Sections 5 and 6 feature a number of products which have been evaluated against a high-level multi-criteria analysis. These products have a variety of considerations before reaching commercial viability and may require staged trials to limit economic risk.

The opportunities which align to diversifying the agriculture sector with new products or industries are presented in Table 6.



Table 6: Priority two opportunities

Opportunity category	Description	Specific opportunities identified in longlist
Protected cropping	Protected cropping, also referred to as greenhouse horticulture, is the production of horticultural crops within, under or sheltered by structures to provide modified growing conditions and/or protection from pests, diseases and adverse weather. In its broadest definition, protected cropping includes the use of greenhouses and glasshouses, shade houses, screen houses and crop top structures ⁴⁸ .	<ul style="list-style-type: none"> • Mangoes • Lychees • Citrus • Avocado • Stone Fruit • Date Palms • Table Grapes
Intensive agriculture	Intensive agriculture is commonly referred to as a system of cultivation whereby there are higher levels of input and output per unit of agricultural land area. For most intensive crops large amounts of labour is required to manage successful crop growth in conjunction with high capital costs for acquiring and maintaining the necessary machinery and infrastructure. The opportunities assessed under this category are not traditional cropping activities and would require a specific unique skillset to develop into a commercially viable industry.	<ul style="list-style-type: none"> • Hydroponics • Aquaculture • Aquaponics
Dryland cropping	Dryland farming is crop production that is reliant on rainfall without using any additional irrigation systems. In its broadest aspects, dryland farming is concerned with all phases of land use under semiarid conditions. Not only how to farm but how much to farm and whether to farm must be taken into consideration. Above all else, dryland farming must emphasize the capture and efficient use of precipitation ⁴⁹ .	<ul style="list-style-type: none"> • Cotton • Chickpeas • Sesame • Mungbeans • Grain Sorghum • Hemp
Bespoke	While these opportunities may use methods outlined in the above categories, they are representative of products which have commercially untested domestic markets, or otherwise represent a discrete step in the commercial pathway of a specific industry (in the case of an abattoir).	<ul style="list-style-type: none"> • Wildflowers • Spinifex Grass • Shea Nuts • Abattoirs

5.3 Priority Three: Enabling opportunities

Many initiatives under priorities one and two are large scale opportunities, that may require significant coordination across multiple stakeholders, and take some time to achieve a return on investment. To balance this, priority three of the sub-strategy provides some activities which could be considered 'quick wins', specifically, opportunities which are generally unlikely to require significant upfront investment, or will exhibit more of an indirect impact on the economy of the region.

⁴⁸ NSW Department of Primary Industries, 2024. *Protected cropping*. Accessed at: <https://www.dpi.nsw.gov.au/agriculture/horticulture/greenhouse#:~:text=Protected%20cropping%2C%20also%20referred%20to,pests%2C%20diseases%20and%20adverse%20weather>.

⁴⁹ Stewart, B.A., 2016. *Dryland Farming*. Accessed at: <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/dryland-farming>



The opportunities which align to enabling the agriculture sector, through non-production activities are included in Table 7.

Table 7: Priority three opportunities

Opportunity category	Description	Specific opportunities identified in longlist
Non-production	The MICC region has a lot of potential to value-add to their already existing prominent agricultural and beef producing region. Mount Isa is in a unique location and provides multiple services for regional communities and businesses who rely on MICC for many of their local services including access to major supermarkets, health care and hospital services, education and commercial airlines. These services are critical to supporting the continuance of a thriving agricultural region within Northwest Queensland.	<ul style="list-style-type: none"> • Educational opportunities • Road grading • Business development opportunities • School based apprenticeships.

5.4 Summary

This section provided a high-level overview of the sub-strategic framework applied to the opportunity categories identified and confirmed throughout stakeholder consultation with MICC, its stakeholders and the agricultural industry. The opportunities longlist identified and considered align with the relevant objectives for the MICC and the three priorities for the region's agriculture sector. The opportunities identified cover three broad categories including:

- Forage crops & grazing support
- Protected cropping
- Intensive agriculture
- Dryland cropping
- Bespoke
- Non-production.

Together, these categories resulted in an opportunity long-list of 30 options. This longlist was further assessed into a shortlist for more detailed investigation.



OPTIONS LONGLIST

6 Options longlist

6.1 Introduction

A range of options have been identified through consultation with key stakeholders from MICC and assessed based on our knowledge of the location, climate, soil suitability and water availability in the region.

After extensive desktop research and consultation with industry and agronomist experts, certain opportunities were determined not to progress to further investigation based largely on the following factors: location, climate, soil and water availability. Due to the critical nature of the economic situation facing the Mount Isa region, preference was given towards opportunities with minimal barriers to implementation, however this does not necessarily exclude some non-shortlisted options from viability should these barriers be addressed in the long term.

6.2 Longlist to shortlist

Table 8 outlines the options longlist and consideration of each opportunity to progress to the options shortlist.

Table 8: Options Longlist

Opportunity	Consideration	Progression
Intensive Agriculture		
<i>Mangoes</i>	Mangoes are considered suitable to the region’s drier climate with potential to match a domestic market window. There may also be opportunities for meeting export market demand. However, the identification of suitable land and a review of more detailed market information may limit the opportunity in Mount Isa.	Progressed to shortlist.
<i>Lychees</i>	Although this crop could grow in the region with appropriate management (e.g., shade structures) there is limited local, domestic or export market opportunity. Further investigation would be required on the domestic market to identify an economic domestic market window.	Not progressed to shortlist.
<i>Citrus</i>	Potentially suitable for lemons, limes, and mandarins to grow in the region’s climate and to create a market window for the product. The opportunity is subject to locating appropriate land in proximity to a reliable water storage.	Progressed to shortlist
<i>Avocado</i>	Nationally, the avocado market has limited capacity for additional supply with limited export opportunities currently available.	Not progressed to shortlist.
<i>Stone Fruit</i>	The climate in Mount Isa is likely suitable to produce some stone fruit varieties. Field trials would be necessary to understand the most suitable varieties to grow. Domestic markets opportunities would require further investigation to understand if there is a market window available that would result in viable production.	Progressed to shortlist.



Opportunity	Consideration	Progression
<i>Date Palms</i>	Date Palms are considered suitable to the region's climate however, identification of suitable land and access to water will be required.	Progressed to shortlist
<i>Table grapes</i>	The market for table grapes in the region is completely exhausted by neighbouring regions which provide a stronger comparative advantage with respect to climatic conditions and logistics.	Not progressed to shortlist.
<i>Hydroponics (greenhouse production)</i>	Hydroponics may be a suitable option for the region to start producing a limited range of fruit and vegetable crops. The biggest challenge being access to water, skilled labour to manage the facilities and the high risk of the operations in a rural and remote region.	Progressed to shortlist.
<i>Aquaculture</i>	Aquaculture in Queensland is growing, however, the process to implement on a commercial scale in a locality as remote as Mount Isa, is challenging.	Progressed to shortlist.
<i>Aquaponics</i>	Aquaponics is a complex system which combines Hydroponics and Aquaculture. This concept is still new in Australia and there have been no records of successful commercial grade systems in the past. However, due to the land size available and potential water availability this may be considered for the region. The biggest challenge to note however, is that the system requires specialist labour staff skilled in aquaculture and hydroponics to ensure the success of the production system.	Progressed to shortlist.
Forage Crops & Grazing Support		
<i>Irrigated Rhodes Grass, Irrigated Forage Sorghum, Irrigated Maize Silage</i>	Opportunity to develop irrigated farming subject to the identification of suitable land in proximity to a water source, individual landowners' willingness to commence irrigated forage production and a review of forage demand within the MICC region.	Progressed to shortlist
<i>Dryland Forage</i>	Opportunity to develop dryland farming for forage subject to an individual landowner's willingness and local demand within the MICC region. The crop yield can still be beneficial in average or below average rainfall years.	Progressed to shortlist.
<i>Bush Hay</i>	Opportunity to develop bush hay subject to an individual landowner's willingness and local demand within the MICC region. The crop yield can still be beneficial in average or below average rainfall years.	Progressed to shortlist.
<i>Supplementary Cattle Feeding</i>	Opportunity for existing graziers to be educated on how to implement supplementary cattle feeding to uplift their pastoral business.	Progressed to shortlist.
<i>On-farm/Mini Feedlots</i>	Opportunity for existing graziers to be educated on how to implement on-farm small-scale feedlots to uplift their pastoral business.	Progressed to shortlist.



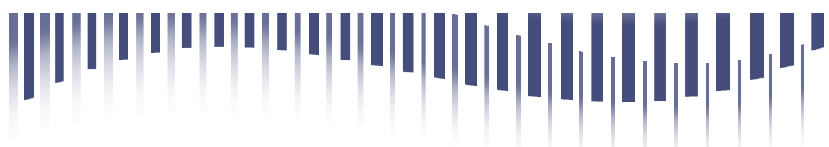
Opportunity	Consideration	Progression
Dryland Cropping		
<i>Cotton, Chickpeas, Sesame, Mungbeans,</i>	Dryland cropping is progressing in Northwest QLD, however there are complex challenges with production, freight, and logistics. The low average rainfall experienced in the MICC region is also likely to be a significant impediment to dryland crops being consistently productive and economically viable.	Not progressed to shortlist.
<i>Grain Sorghum, Hemp</i>	Given current opportunities developed across regional Australia in hemp and grain sorghum these crops would benefit from further evaluation against the specific climate and land considerations in the MICC region.	Progressed to shortlist.
Other		
<i>Wildflowers</i>	It is likely that there will only be a small opportunity and interest for Wildflowers in the MICC region due to the various factors which remain unknown including seasonal availability and reliability, environmental regulations, supply volumes, access to markets, logistics and transport.	Not progressed to shortlist.
<i>Spinifex Grass</i>	Spinifex is crucial for certain native animals in the area. It is a perennial grass which could potentially support the commercial production of nanofibers if demand was prevalent. Due to the untested commercial market and broad applications of the nanofiber product, further research is required to understand the opportunity and ensure minimal negative environmental impacts from its production. Commercial plantings of spinifex could be considered if the demand for nanofibers was significant.	Progressed to shortlist.
<i>Shea Nuts</i>	Shea nuts are a commercially untested product in the domestic market. The MICC region would be suitable for Shea nut if suitable land in proximity to a water source was located. Given that there are no commercial variety trials of Shea nuts in Australia, this opportunity is currently considered to be in a concept stage.	Not progressed to shortlist.
<i>Educational opportunities</i>	Stakeholder consultation has identified several opportunities for educational workshops / seminars that could lead to an increased output from existing operators in the agriculture sector. These educational seminars could focus on water access rights, land tenure and ownership or other relevant regulatory matters impacting the agriculture sector.	Progressed to shortlist.
<i>Road grading and upgrades</i>	Stakeholder consultation has identified that outside of production related opportunities, road quality is of major concern for local operators in the agriculture sector. Timely and effective road maintenance is key towards maximising productivity and economic benefits of existing cattle operations in the MICC region.	Progressed to shortlist.



Opportunity	Consideration	Progression
<i>Business development opportunities</i>	There are minimal networking and business development opportunities available to local operators in the agriculture sector. Facilitating regular business development events would provide both a networking opportunity, and a forum to evaluate on-farm productivity initiatives (e.g., forage crops and grazing support, on-farm feedlots).	Progressed to shortlist.
<i>Abattoir</i>	A locally based abattoir would provide a natural synergy with the cattle industry and serve to centralise more elements of the beef supply chain, additionally there may be potential for a kangaroo processing facility. This is likely to be an initiative that results in significant employment opportunities.	Progressed to shortlist.
<i>School based apprenticeships</i>	There is an opportunity to partner with TAFE Queensland to provide a career pathway to the agriculture sector for local students. This would require leadership by MICC and engagement with local graziers and landholders to ensure that entry level career opportunities exist at the end of these pathways.	Progressed to shortlist
<i>On-farm upgrades</i>	There are a number of minor projects that could be undertaken with funding through the Department of State Development and Infrastructure to increase stocking rates (e.g., paddock redesign, installation of fences, additional watering points etc.).	Progressed to shortlist.

6.3 Summary

Through desktop research and expert consultation, the initial longlist of 30 prospective agricultural opportunities has been reduced to 18 shortlisted options, which have all passed a preliminary screening of critical project considerations or have otherwise demonstrated merit in a way that is niche, or supplementary to existing industry which necessitates their inclusion in the next round of multi-criteria analysis.



OPTIONS ASSESSMENT

7 Options assessment

7.1 Introduction

Section 5 assessed at a high level, a longlist of options, which were refined to a shortlist nominated for detailed multi-criteria analysis. The purpose of this section is to assess the options progressed from section 5. The intent of the assessment is to identify the preferred options that may be suitable for further funding or investment from government, or private sources.

7.2 Overview of Options Shortlist

As discussed throughout the report, several potential options have been identified. Following initial investigation of the options, and in consultation with key stakeholders, the options have been grouped and shortlisted to options expected to present the most sustainable outcomes for MICC. These options are outlined in Table 9.

Table 9: Options Shortlist

Opportunity
Intensive Agriculture
<i>Mangoes, Citrus, Stone Fruit, and Date Palms</i>
<i>Hydroponics (greenhouse production)</i>
<i>Aquaculture</i>
<i>Aquaponics</i>
Forage Crops & Grazing Support
<i>Irrigated Rhodes Grass, Irrigated Forage Sorghum, Irrigated Maize Silage</i>
<i>Dryland Forage</i>
<i>Bush Hay</i>
<i>Supplementary Cattle Feeding, On-farm/Mini Feedlots</i>
Dryland Cropping
<i>Dryland Grain Sorghum, Hemp</i>



Opportunity
Other
Spinifex Grass
Road Grading
Abattoir - game (Kangaroos, wild pigs and goats)
Abattoir - beef
School Based Apprenticeships / Business Development Opportunities / Educational Opportunities
Increased Stocking Rates

To ensure that a consistent approach is taken to the evaluation of potential Agriculture initiatives, the Project Team has created an opportunities matrix to assess each initiative individually. A brief overview of the evaluation criteria is outlined in Figure 19.

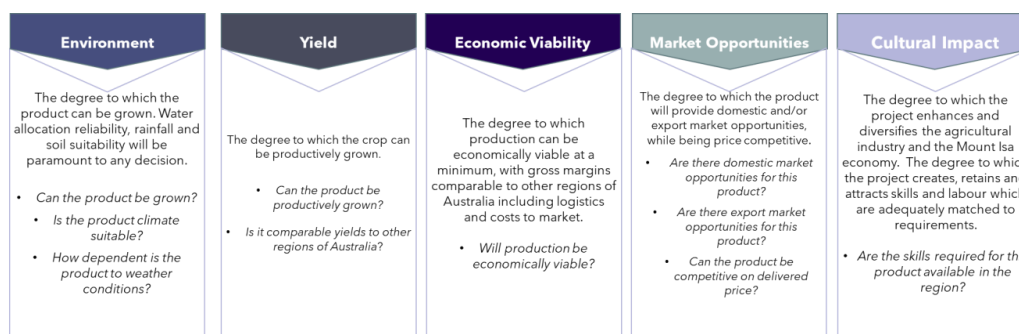


Figure 19: Evaluation Criteria

Each opportunity analysed will be scored in a qualitative approach against these five criteria. The assessment will allocate a rating for each potential opportunity made on the traffic light system identified in Figure 20. This assessment is intended to be high-level and not based on quantitative or detailed findings.

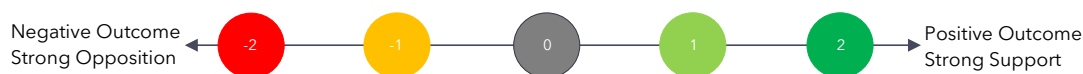


Figure 20: Traffic Light Rating Criteria



OPTIONS ASSESSMENT

7.3 Options Assessment

Table 10 presents the outcome of the multi-criteria analysis, including considerations for each opportunity's pathway to commerciality and ease of implementation.

Table 10: Options Assessment

No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
Intensive Agriculture							
1.	Mangoes	<p>In order to develop a commercially viable mango crop the following factors must be present:</p> <ul style="list-style-type: none"> 10 ML/ha of highly reliable water. Adequate depth of quality soil to a minimum depth of 1.0m+. A suitable portion of land unlikely to exceed 200ha. <p>Further investigation of market opportunity and likely production window for mangoes is recommended. Mangoes would be considered low difficulty for implementation due to the well developed industry and accompanying skillsets that exist domestically. Pests and insects may be a risk for Mangoes.</p>	1	1	0	1	2
2.	Citrus	<p>In order to develop a commercially viable citrus crop the following factors must be present:</p> <ul style="list-style-type: none"> 12 ML/ha of highly reliable water (some of which may be required for cooling). Adequate depth of quality soil to a minimum depth of 0.8m. A suitable portion of land unlikely to exceed 200ha. <p>Citrus products are likely to have a larger market opportunity / window, with low difficulty in implementation due to the well developed industry and accompanying skillsets that exist domestically. Pests and insects may be a risk.</p>	1	1	1	1	2



No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
3.	Stone Fruit	<p>In order to develop a commercially viable stone fruit crop the following factors must be present:</p> <ul style="list-style-type: none"> • 10 ML/ha of highly reliable water. • Adequate depth of quality soil to a minimum depth of 0.8m. • A suitable portion of land unlikely to exceed 100ha. <p>Further investigation on variety selection (e.g. peaches, nectarines etc.) is required, and will impact market window. Pests and insects may be a risk for certain varieties. Native birds will be a significant risk and the crop will need to be protected with netting.</p>	0	0	0	1	2
4.	Date Palms	<p>In order to develop a commercially viable date palm crop the following factors must be present:</p> <ul style="list-style-type: none"> • Approximately 8 - 10 ML/ha of medium priority water (due to the increased resilience of this crop). • Requires friable soil to a minimum of 1.0m. • Trial plantings may be 25 - 50ha with commercial plantings up to 200ha likely. <p>Australia is a net importer of dates and as such there is expected to be a significant market for this product. This is a high value by weight product, which offsets the extreme cost of freight in the region. Date palms are labour intensive due to the need to hand pooinate and bag the bunches to stop bird damage. Harvesting is also slow and costly. This product could provide additional downstream production benefits e.g. drying. Significant labour costs could impede on the economic viability of this opportunity.</p>	2	2	0	2	1



No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
5.	<i>Hydroponics (greenhouse production)</i>	<p>The cost of power (to provide heating, cooling and general system operation) is a significant impact on the viability of a hydroponics operations in the region. There is also a relatively small market for the products of a hydroponics system. Additionally, the level of expertise required to manage and operate a system of this nature is limited in Australia.</p> <p>Despite the challenges, hydroponic production of leafy vegetables offers a local supply of fresh produce, which could be used to support remote First Nations Communities. There are cultural benefits associated with this outcome, however they must be balanced with the viability of operating a system of this nature. Further detailed assessment is required if this option is to be progressed as a commercial opportunity. Soil type is not a critical factor due to all infrastructure being above ground. Land and location need to be flat and have access to mains power and water and preferably within the MICC LGA.</p>	1	1	0	0	1
6.	<i>Aquaculture</i>	<p>The cost of power (to provide heating, cooling and general system operation) is a significant impact on the commercial viability of an aquaculture operation in the region. Additionally, the level of expertise required to manage and operate a system of this nature is limited in Australia. Further detailed assessment is required if this option is to be progressed as a commercial opportunity. Soil type is not a critical factor due to all infrastructure being above ground. Land and location need to be flat and have access to mains power and water and preferably within the MICC LGA.</p>	1	1	1	1	1



No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
7.	<i>Aquaponics</i>	The combination of aquaculture and hydroponics systems creates further challenges, and ultimately results in a highly complex operation. The expertise to manage a system of this nature is limited in Australia. There is no evidence of an aquaponics system in Australia that has reached commercial maturity, and as such this option is not recommended. Further detailed assessment is required if this option is to be progressed as a commercial opportunity. Soil type is not a critical factor due to all infrastructure being above ground. Land and location need to be flat and have access to mains power and water and preferably within the MICC LGA.	1	-1	0	1	1
Forage Crops & Grazing Support							
8.	<i>Irrigated Rhodes Grass, Irrigated Forage Sorghum, Irrigated Maize Silage</i>	<p>In order to develop a commercially viable irrigated forage crop the following factors must be present:</p> <ul style="list-style-type: none"> • Approximately 8 - 10 ML/ha of medium priority water (due to the increased resilience of this crop). • Required friable soil to a minimum of 0.5m. • Due to a strong local market for this product a portion of land as large as 1,000 ha could likely be economic for production, the size of this crop would only be limited by water availability. <p>The existence of a local market for these products greatly increases the comparative advantage of production in the region. Production of these crops is a highly mechanised operation with minimal labour. These crops could be grown as an independent operation or in partnership with local graziers. The introduction of an irrigated forage solution has the potential to spur a cultural change in the grazing dominated region, with a shift towards cropping operations that benefit the existing industry.</p>	2	2	2	2	2



No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
9.	<i>Dryland Forage</i>	<p>In order to develop a commercially viable dryland forage crop the following factors must be present:</p> <ul style="list-style-type: none"> Reliable rainfall. Adequate depth of quality soil with a minimum water holding capacity of 100-150mm. Planted areas are likely to be small on individual graziers' properties. Each planted area likely to be 25-50ha/grazier. <p>Due to the low quality of soil and variability of rainfall in the region, dryland forage crops are not considered to be a strong option. If linked to an irrigated forage solution the economics of dryland cropping would be improved, however without this it would be unlikely to be viable.</p>	-1	-1	-1	2	2
10.	<i>Bush Hay</i>	<p>In order to develop a commercially viable bush hay crop the following factors must be present:</p> <ul style="list-style-type: none"> Moderately reliable rainfall. Requires relatively flat land with few or no rocks where the ideal native grasses grow. <p>Bush hay has been demonstrated to follow cultural changes in farming development, for example the Emerald Irrigation scheme where the move to irrigated farming led to large areas of dryland cropping. Bush hay production is suited towards flat land with native flinders or mitchell grass pasture.</p>	2	1	0	2	2
11.	<i>Supplementary Cattle Feeding & On-farm/Mini Feedlots</i>	<p>This is an educational opportunity with the potential to increase business development for local graziers. In order to be successful it requires expertise and capital. To pursue this option a suitable expert consultant should be identified to engage directly with local graziers, who should be encouraged to seek funding through available sources for capital works (e.g. Department of State Development and Infrastructure). These measures have a strong potential to build resilience in the regions grazing industry.</p>	2	2	2	2	1



No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
Dryland Cropping							
12.	<i>Dryland Grain Sorghum, Hemp</i>	<p>In order to develop a commercially viable grain sorghum or hemp crop through dryland cropping the following factors must be present:</p> <ul style="list-style-type: none"> • High volume of reliable rainfall. • Adequate depth of quality soil with a minimum of 100-150mm water holding capacity. • Land size is relative to the value of the end product but likely to be 200 - 500ha+ for economically viable production (even with reliable high rainfall). • If growing for fibre, sufficient area and production would be required to justify the construction of a fibre processing plant. <p>Due to the high variability in annual rainfall, and poor quality soil within the Mount Isa region, these opportunities are not preferred for further development.</p>	-2	-1	-1	1	1
Other							
13.	<i>Spinifex Grass</i>	<p>While the commercial production of Spinifex grass and its downstream production opportunities are promising, further research is required to ascertain the economic viability of this initiative, which is currently in early-mid stages of production research and testing.</p> <p>Some considerations for further investigation include:</p> <ul style="list-style-type: none"> • The demand for downstream, processed products • The nature of the harvesting operation and strategy (e.g. commercial or traditional) • The environmental impacts of large scale harvesting 	2	2	0	0	1



No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
14.	Road grading	Road quality is not only a safety measure but also impacts the commercial viability for local graziers by dictating when they can bring their product to market. Enhancements to MICC's asset management (roads) strategy would ensure that graziers can access markets at peak times. Reliable access to funding when works need to be completed, based on the needs of landholders, the severity of weather damage, and the availability and utilisation of local contractors is a key enabler of this work.	1	1	1	1	1
15.	Abattoir - game (Kangaroos, wild pigs and goats)	The potential advantage of having a game meat processing facility in Mount Isa is the direct positive impact this could have on the grazing industry that already exists. Graziers in the region have a need for kangaroo populations to be reduced/managed and feral pigs to be removed from their operations and shooters are licensed to take them.	2	2	1	2	2
16.	Abattoir - beef	The NW QLD region and west into the NT is widely recognised as an ideal cattle breeding region and that fattening cattle is un-reliable due to highly variable weather conditions between seasons. The unreliable ability to fatten cattle on native pasture would result in cattle supply challenges during dry seasons. There may be an option for an abattoir that could process old/dry cows that are not profitable to transport to east coast abattoirs to improve the viability of the abattoir during dry years.	0	0	0	0	0



No.	Options	Requirements and Ease of Implementation	Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
17.	<i>School Based Apprenticeships, Business Development Opportunities and Educational Opportunities</i>	<p>In order to create a sustainable pipeline of skilled employees in the agriculture sector it is necessary to engage with young people at the school level. Initially, MICC should be the regional lead for this development strategy, and partner with schools, TAFE Queensland and industry players to facilitate an early introduction to careers in the agriculture sector.</p> <p>This is a business development and networking opportunity focused on providing local farmers with a forum to discuss business improvement and innovation in the agriculture sector as well as navigate regulator and legal challenges. In order to progress this opportunity MICC should identify appropriate presenters / facilitators based on topics that have the most broad interest to the local agriculture sector. It would also be beneficial to engage with industry bodies on marketing these sessions, and ensuring that attendance is maximised. These sessions are not only an opportunity for business development, but the networking component can serve as a protective factor against mental health issues, in a known isolated, rural field.</p>	1	1	1	1	1
18.	<i>Increased Stocking Rates</i>	<p>Stakeholder consultation has identified that a number of small scale projects have been proposed in the region to increase stocking rates and overall production among local graziers. These projects may be appropriate for funding under the Department of State Development and Infrastructure. Engagement with Southern Gulf NRM and local landholders is recommended for the coordination and advocacy of these individual projects.</p>	1	1	1	1	1



7.4 Preferred Options

At a high-level, the assessment reviewed the performance of each option against the key considerations. It is important to note that capital and operational costs were not considered as part of the options assessment.

The options assessment has identified the top 10 agricultural opportunities most suited to the MICC region (noting that opportunities 8, 9, 10 and 11 received an equal score), which are as follows:

1. Irrigated forage crops (e.g., Rhodes grass, forage sorghum, maize silage)
2. Game abattoir (e.g., kangaroos, wild pigs, goats)
3. Supplementary cattle feeding & on-farm / mini feedlots
4. Bush hay
5. Date palms
6. Citrus
7. Spinifex grass
8. Increased stocking rates
9. School based apprenticeships / business development opportunities / educational opportunities
10. Road grading
11. Aquaculture

7.5 Summary

The MCA has identified the ten most suitable projects based on their environmental suitability, prospective yield, economic viability, access to markets and impact on the cultural dynamics of Mount Isa and its agriculture sector. While the top 11 opportunities will be the focus for detailed discussion, lower priority opportunities have been assessed with a path to commerciality, should future events or information impact their current rating / desirability for further investment.



8 Project pathways

8.1 Introduction

Based on the results of the above assessment in section 6, this section will further discuss the top 10 options and their commercial pathways and opportunities within the MICC region. Please note that some opportunities may require further detailed analysis with respect to site and water availability, market demand, logistics costs and capital / operational expenditure. These implementation factors are expected to be dynamic in response to environmental or economic conditions.

8.2 Opportunities

8.2.1 Irrigated forage crops (e.g., Rhodes grass, forage sorghum, maize silage)

The opportunity

Forage crops are crops grown specifically to be grazed by livestock or conserved as hay / silage. Forage crops assist graziers in achieving production targets for cattle, such as weight gain, and can be a valuable tool in addressing seasonal shortfall between feed demand and supply (e.g., a lack of naturally occurring forage). Beyond their production impacts, forage crops can also play an important ecological role in maintaining ground cover, preventing soil erosion, accumulating nitrogen in pasture soil and improving overall land condition⁵⁰.

This opportunity focuses on irrigated forage crops, which rely on supplementary water through mechanical irrigation systems to support yield, especially in response to detrimental environmental conditions. The specific forage crops under consideration or this opportunity are:

- **Rhodes grass:** A perennial grass which experiences strongest growth in warmer weather (spring, summer, autumn). Rhodes grass is suitable to a wide variety of soils, with a moderate resistance to drought and low tolerance to frost⁵¹.
- **Forage sorghum:** Available in annual or perennial varieties, experiences strongest growth in warmer weather (spring, summer, autumn). Forage sorghum prefers heavier soil types, with a strong drought resistance and a low tolerance to frost⁵².
- **Maize silage:** An annual crop which experiences strongest growth in warm weather (summer). Maize silage requires more sensitive growing conditions in comparison to sorghum and Rhodes grass, requiring high rainfall or dedicated irrigation, with a low tolerance to frost⁵³.

Irrigated forage crops sit under *priority two* of the Agriculture Strategy, and would represent a shift in the industry from typical agricultural practices in the region (e.g., grazing) to a greater focus on cropping.

⁵⁰ Meat and livestock Australia - Forage crops - <https://www.mla.com.au/research-and-development/Grazing-pasture-management/forage-crops/#:~:text=Forage%20crops%20are%20grown,between%20feed%20demand%20and%20supply>.

⁵¹ NSW Department of Primary Industries - Rhodes grass - <https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/species-varieties/rhodes-grass>

⁵² Australian Dairy Hub - Grain and forage sorghum - <https://northernaustraliandairyhub.com.au/wp-content/uploads/2021/11/Grain-and-Forage-Sorghum-Agronomy.pdf>

⁵³ Lucid central - Maize factsheet - <https://keys.lucidcentral.org/keys/v3/pastures/Html/Maize.htm>



Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
2	2	2	2	2

As the top preference option resulting from the MCA process, irrigated forage crops scored a maximum value on each criteria assessed, which is indicative of the confidence in this potential opportunity.

The distinct comparative advantage for irrigated forage crops is the direct pipeline from production to use in a hyper-local market (Mount Isa and direct neighbouring regions). Due to the size of the grazing industry in Mount Isa and across northwest Queensland, there is a strong demand for forage support crops. Currently, these crops are sourced from southeast Queensland and more broadly across the south of Australia. A local source for these crops would reduce the costs for local grazing operations substantially, as some stakeholders have indicated that the cost of transport forage crops from the south of Australia is equal to the cost of the product itself.



The alternative side to the high logistics costs of purchasing forage support crops, is that the profit margin for a local producer would be much larger than those located in the south of Australia. For example, if one bale was sold in the south of the country for \$100, and the transport costs associated with that bale to reach Mount Isa are an additional \$100, the landed cost for a local grazier is \$200 per bale. A local crop producer could charge a price point anywhere between \$100 and \$200, while taking into account differences in development cost, and retain a market advantage over producers in the south of the country, as transport costs would be significantly reduced. This transforms the economics of forage crop production and provides a flat increase to the value by weight / land usage of the product.

Beyond the strong economic case for irrigated forage crops, there are a number of other factors which scored highly during the MCA process. There are robust species of forage support crops that would be suitable for the harsh climatic conditions of Mount Isa, for example forage sorghum and Rhodes grass which are both hearty and resistant to drought. The benefit of forage crops, especially those under an irrigated system is that regardless of whether a crop reaches maturity (for example due to poor supplementary rainfall) it can still be used as a forage solution, albeit at slightly reduced efficiency.

The transition to increased cropping activity, while not a historic feature of Mount Isa’s agriculture sector, is considered a positive factor noting the overall project’s focus on diversification and growth of the economy. This change in focus is likely to lead to greater self-sufficiency of the existing market for grazing production, and reduced costs for local operators.



Production information

While there are a variety of forage support crops that could be considered under this opportunity, for simplification, production information has been provided on the most likely cropping solutions, based on both the climate of Mount Isa, and those which are common in servicing the agriculture industry in Northern Queensland, as outlined in Table 11.

Table 11: Production values for irrigated forage crops⁵⁴

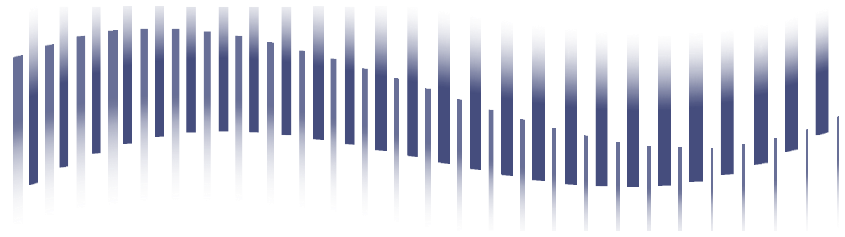
Crop	Seasonality	Water	Pests and Disease	Establishment	Animal Production Value
Rhodes grass	Warm season	Well suited to irrigation at an indicative rate of 8-10ML per hectare of crop If supported by rainfall a rate of 500-1,200mm per annum is ideal, which is slightly higher than Mount Isa's average.	Severe attack by armyworm and pasture webworm can destroy much of the leaf, particularly young leaves, however this is more prevalent in coastal areas.	As a single species should be sown at a rate of approximately 1-2kg/ha between spring and early autumn.	It can carry about 1 - 4 beasts/ha depending on pasture productivity and size of animal. Annual liveweight gains of up to 170 kg/head are achievable. Production levels decline without a vigorous legume or the use of fertiliser nitrogen.
Annual forage sorghum	Warm season	Well suited to irrigation at an indicative rate of 8-10ML per hectare of crop Slightly lower water requirements than Rhodes grass. If supported by rainfall an ideal rate is 500-800mm per annum which is slightly higher than Mount Isa's average.	Nil of significance	As a single species should be sown at a rate of approximately 15-20kg/ha under irrigated conditions at a seasonal point when soil temperatures reach 16 degrees.	Generally, liveweight gains vary between 0.5 to 1.0 kg per head per day depending on plant height and leafiness.

⁵⁴ Pastures Australia, 2024. *Pastures*. Accessed at: <https://keys.lucidcentral.org/keys/v3/pastures/>
Mount Isa Transformation of Economy - Agriculture Recommendations Report



Crop	Seasonality	Water	Pests and Disease	Establishment	Animal Production Value
Maize silage	Warm season	Well suited to irrigation at an indicative rate of 8-10ML per hectare of crop. High water requirement. If supported by rainfall, an ideal rate is approximately 1,200mm per annum which is considerably higher than Mount Isa's average.	Wireworms or cutworms can be problematic during establishment. Two-spotted mite, black beetle and armyworm can also be of concern.	The sowing rate as a single species for maize is dependent on seed size and desired population, variable by species. Typically, a plant population between 40,000-90,000/ha is desirable. This can be increased for irrigated crops.	Due to the high energy density of maize silage, it can produce a liveweight gain of up to 1kg per head per day ⁵⁵ .

⁵⁵ Meat & Livestock Australia, 2009. *Feeding silage to cattle*. Accessed at: <https://www.thebeefsite.com/articles/2104/feeding-silage-to-beef-cattle/#:~:text=The%20potential%20for%20high%20ME,to%201.03%20kg%20per%20day>.



Economic information

Production economics

The production economics of irrigated forage crops can be highly variable dependent on environmental conditions, selected species, pest interference and many other factors. However, to provide some indicative values, the Northern Australian Dairy Company⁵⁶ has collated information from rural merchandising outlets in South East Queensland. Please note that these figures should be considered broadly indicative only, and actual production economics in the Mount Isa region will vary from these costs. Further detailed feasibility should be conducted by prospective investors to determine relevant figures for the local market.

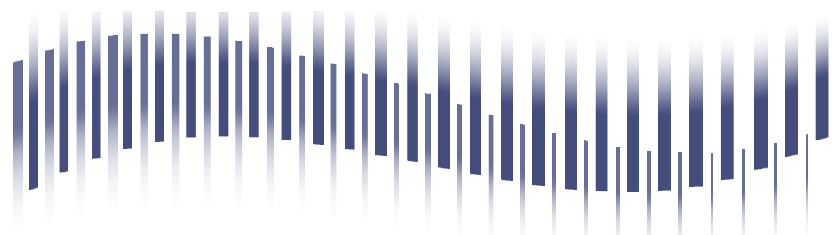
- Rhodes grass
 - Establishment and maintenance cost \$1,022.27/ha
 - Feed utilisation 10,500 kg of dry matter (DM)/ha (assumed utilisation rate of 70%)
 - Cost of feed \$0.10 per kgDM
- Forage sorghum
 - Establishment and maintenance cost \$931.74/ha
 - Feed utilisation 10,200 kgDM/ha (assumed utilisation rate of 60%)
 - Cost of feed \$0.09 per kgDM
- Maize silage
 - Establishment and maintenance \$2434.72/ha
 - Feed utilisation 7000 kgDM/ha (assumed utilisation of 100%)
 - Cost of feed \$0.35 per kgDM

Business model and commercialisation

Production of irrigated forage crops is generally a highly mechanised operation which results in minimal direct labour impacts. Despite this, it serves as an important enabling factor to the local grazing industry, which is the powerhouse of the local agriculture sector (see *Mount Isa Transformation - Agriculture Profile*). One method of commercialisation of irrigated forage crops would be as an independent, pure cropping operation which would likely be run by an individual or group with existing experience in cropping. The advantages of this method would be a low barrier to entry, with an operator who has applicable skills and well-defined operating methods. The disadvantage would be in establishing routes to market for the product, as an operator without history in the Mount Isa region, or without grazing experience, would need to establish these market relationships.

Another method would be establishing production in partnership with local graziers / major grazing operations. The benefits are a well-developed knowledge of the grazing industry and forage crop requirements, as well as a direct line to market and established connections with the local grazing industry. The challenge for this model would be a lack of cropping experience, which is likely to negatively impact the efficiency of the operation in the short-term, until the skill gap can be bridged. Both models bring substantial benefits, and challenges that can be mitigated.

⁵⁶ Northern Australian Dairy Hub, 2023. *Agronomy factsheets*. Accessed at: <https://northernaustaliandairyhub.com.au/resources/feedbase-nutrition/agronomy/>



Ultimately the identification of an individual investor or group should be the determining factor in the business model for this opportunity.

The potential to spur a cultural change in the approach to agriculture across the region is a significant advantage in the strengthening and diversification of the Mount Isa agriculture economy.

Case study - what are the best perennial fodder options? (Broome, WA)⁵⁷

The study



Western Australia’s Department of Primary Industries and Regional Development (DPIRD) planted a perennial grass variety trial to compare 12 popular options (Figure 21). All the grasses were tropical or subtropical species, after previous trial work near Broome showed that temperate species struggle to cope with the hot, humid wet season conditions, and cannot compete in terms of dry matter yield.

Data collected from this trial and others supports the theory that as dry matter yield increases, feed quality decreases. This is due to an increasing proportion of stem in the sward compared to leaf, which is more fibrous and therefore less digestible.

Figure 21: Perennial fodder trial, Broome WA

commercial hay machinery. Data were collected from 23 cuts over a two-year period.

DPIRD’s perennial grass trials were sampled every 28 days and then mown and baled to ‘reset’ them using

The result

Rhodes grass (*Chloris gayana*) under irrigation is highly productive and relatively resilient to seasonal variation. When cut every 28 days, as in a commercial hay operation, dry matter yields of up to 35-40 t/ha annually are an achievable benchmark.

This means that Rhodes grass has an average daily growth rate of over 100 kg/ha/day dry matter. In reality, the daily growth rates change with the seasons, varying from 50kg/ha/day to 200kg/ha/day. The main factor driving this variation is the minimum night-time temperatures experienced in the dry season that slow the growth rate.

To maintain this level of dry matter production, fertiliser inputs are required. DPIRD conducted a nitrogen rate trial to generate a response curve to inform nitrogen decision making. The form of nitrogen fertiliser tested in this trial was granular urea, though other nitrogen fertilisers are currently being investigated. Lysimeters buried in the ground beneath the plots trap leached water and nutrients for analysis.

Moderate nitrogen (N) rates of 2-3 kg N/ha/day achieve 35-40t/ha dry matter and applying more than this does not produce more biomass (Figure 22). At these rates, crude protein is around 12%, which is adequate for liveweight gain, but as more N is applied, protein levels do increase.

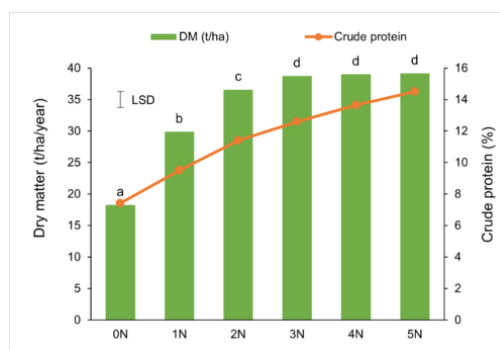
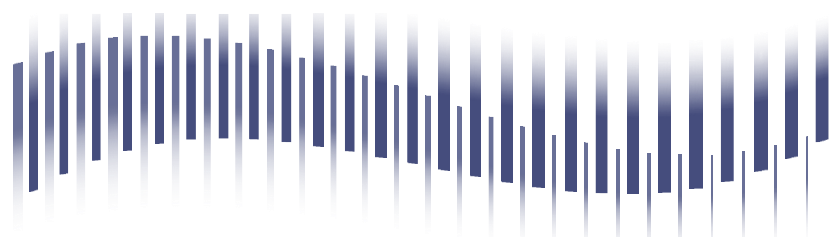


Figure 22: Dry matter and protein production by nitrogen rate

⁵⁷ Department of Primary Industries and Regional Development, 2023. *Fodder research yields big opportunity for small-scale irrigation in northern WA* - <https://futurebeef.com.au/resources/fodder-research-yields-big-opportunity-for-small-scale-irrigation-in-northern-wa/>



8.2.2 Abattoir - Game Meat

The opportunity

Game meat refers to any type of meat that originates from animals that have lived in the wild and were hunted for food, as opposed to being bred and reared on a farm for consumption. In most states and territories in Australia, game meat is largely only allowed to be hunted with approval. The most common types of game meat hunted in Australia includes Venison, Kangaroo, Boar (Pig) and Rabbit. Game meat refers to meat sourced from vertebrate animals (excluding fish) that are not raised like livestock but are lawfully hunted in their natural habitat.

Game meat processing facilities are premises where game meat is handled for human consumption, encompassing activities such as processing, packaging, storing, and other related tasks. These facilities receive unskinned carcasses of wild animals from the field or a designated depot, then proceed to skin them, irrespective of whether further processing such as boning or cutting occurs on-site. According to the Export Control (Wild Game Meat and Wild Game Meat Products) Orders 2010, the Establishment Occupier bears the responsibility to develop, implement and maintain the approved arrangement of the establishment. This arrangement must adhere to food safety and product integrity standards and aid in securing market access.⁵⁸ In Australia, there is a growing demand for game meat for human and pet consumption and exports to Europe, North America, Japan, Korea and South East Asia.⁵⁹ In the past, Russia relied heavily on kangaroo meat for their sausage production due to its affordability. However, they have now shifted their preference to buffalo meat. Consequently, Australia has had to turn down Russian requests for kangaroo meat because it is no longer as economically viable to supply due to the rising costs of the raw product. Another challenge the industry is facing is its dependency on other major protein markets including beef and lamb which are not getting the high prices they previously commanded, so game meat has to remain competitive.⁶⁰

The opportunity for a game processing facility in Mount Isa sits under *priority two* of the Agriculture Strategy, as the game meat industry in the area is relatively underdeveloped in comparison to the beef / grazing industry.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
2	2	1	2	2

This option has been identified as the second preference option resulting from the MCA process, with each of the assessed criteria scoring a maximum value except for *Criteria 3 - Economics Viability* which scored a 1 due to inputs, logistics and access to markets.

The potential advantage of having a game meat processing facility in Mount Isa is the direct positive impact this has on the grazing industry that already exists. Graziers in the region have a need for kangaroo populations to be reduced/managed and feral pigs to be removed from their operations and shooters are licensed to take them.

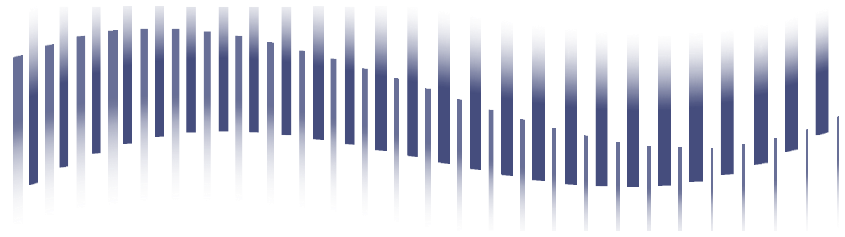
Production information

Game meat processing facilities are required to ensure that the premises are provided with the necessary services of water, waste disposal, light ventilation, cleaning and personal hygiene facilities, storage space and access to toilets in line with the relevant requirements outlined in the Food Standards Code. A challenge for an operation of this kind in Mount Isa may be access to water and the quality of the water available. Previously, Mount Isa had a fit-

⁵⁸ Department of Agriculture, Fisheries and Forestry. *Approved arrangement guidelines - Wild game meat*. Accessed at <https://www.agriculture.gov.au/biosecurity-trade/export/controlled-goods/meat/elmer-3/aa-wildgame>

⁵⁹ Australian Meat News. *Totally Wild Comes of Age* (March 2024). Accessed at <https://ausmeatnews.com.au/2024/03/totally-wild-comes-of-age/>

⁶⁰ Ibid.



for-purpose small abattoir built however the project was deemed unviable as the water supplied by MIWB and MICC did not meet international export standards⁶¹.

Currently, there are local kangaroo box operators in Mount Isa who produce approximately 20-27 tonnes of kangaroo meat per fortnight, and it has been advised that there is potential capacity to produce more. Wild Game Processing Pty Ltd, based in Longreach, is well established with chiller boxes in locations as widespread as Hughenden, Eromanga, Barcaldine, and Charleville. In 2022, the business stated that it was processing 8,000 carcasses per month and by reducing electricity costs through implementing solar panels could increase this to 14,000 carcasses per month.⁶² These numbers are a representation of the potential yield which could be achieved within the MICC region.

Economic information

Game meat production in Australia is still considered a relatively new niche market when compared with more traditional meat production including beef, lamb and pork which have been commercially sold for hundreds of years. Over the last 30 years, the game meat industry has developed significantly and continues to do so with approximately 60 - 70 wild game meat processing facilities in Australia, the majority of which are licensed for pet food. Department of Foreign Affairs and Trade (DFAT) has reported that Australia's kangaroo meat is exported to over 60 overseas markets, however, official figures on the value of the industry is limited.⁶³

Case study: Wild Game Processing Pty Ltd - Longreach, Queensland

Wild Game Processing is based in Longreach and opened for business in 2018. They operate 11 chiller boxes in Hughenden, Eromanga, Barcaldine and most recently expanded their business into Charleville where they purchased a kangaroo processing facility that had been closed since 2009.

Despite this loss in funding, the business operators stated that they currently have more demand than supply and needed to expand. The business mostly supplies pet food and to crocodile farms who believe their animals respond better to red meat rather than chicken.

Wild Game Processing is an approved employer with the Pacific Australia Labour Mobility Scheme and hopes to employ approximately 50 people as part of their expansion into Charleville.

Case study: Russell Peters - Mount Isa, Queensland

As part of our consultation process and information provided to us by Council, we are aware that a small abattoir in Mount Isa had been purpose built to service approximately 10 tonnes of kangaroo carcasses per week. The business plan included supplying the meat for human consumption with a ready market in Germany, to local Indigenous communities, local restaurants, and butchers as a protein alternative and for the growing pet food market. The project was expected to engage up to 30 field harvesters and employ six full time staff operating for 10-11 months of the year. Unfortunately, the project was deemed unsuccessful at the time due to the water supplied by MIWB and MICC not able to meet the standard for international export. The abattoir infrastructure remains within Mount Isa, however, has been converted to workshop space and is owned by a local trucking company.

8.2.3 Supplementary Cattle Feeding & On-farm / Mini feedlots

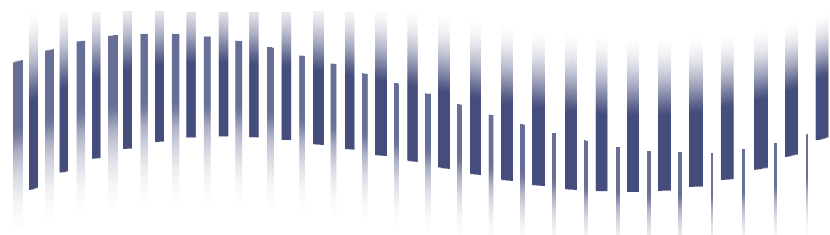
The opportunity

Supplementary cattle feeding is used in grazing systems to help fulfill production requirements. It can either be integrated as a routine aspect of the production cycle to align feed demand with feed availability or be set aside for

⁶¹ Information received from Mount Isa City Council during consultation.

⁶² Queensland Rural and Industry Development Authority (QRIDA). *Funding puts a 'skip' in meat processing facility* (August 2022). Accessed at <https://www.qrida.qld.gov.au/client-story/funding-puts-skip-meat-processing-facility>

⁶³ Australian Meat News. *Totally Wild Comes of Age* (March 2024). Accessed at <https://ausmeatnews.com.au/2024/03/totally-wild-comes-of-age/>



periods of drought. The frequency of supplementary feeding hinges on the business goals and prevailing seasonal circumstances. Important considerations in supplementary feeding include the following:

- **Animal health:** it is essential animal health is considered during drought. When supplementary feeding the nutritional requirements of the animal as a ruminant must be considered and an appropriate ration devised accordingly. If supplementary feeding is not possible, livestock should be sold or put on agistment.
- **Feed budgeting:** Feed budgeting involves forecasting whether the available feed for a group of animals is enough to fulfill their needs. This requires an understanding of the variation in pasture growth rates over the year in a specific location.
- **Production objectives:** By identifying the need for supplementary feeding and aligning feed requirements with production objectives, the most suitable feed source can be identified and the impact of supplementation on the operating margin minimised.
- **Nutrition:** To uphold optimal rumen function and promote animal well-being, supplementary feeding must meet the animals' requirements for protein, energy, fibre, and minerals. When supplementary feeding aims for specific production goals, like increased weight gain, it's crucial to ensure a balanced diet that is both economically viable and nutritionally adequate⁶⁴.

Feedlots are purpose-built facilities designed to supply livestock with a balanced diet, comprising primarily of grains. In Australia, the majority of cattle begin their lives in a paddock, grazing on high fibre grasses and pasture, with about one third of the cattle then transitioning to a feedlot environment.⁶⁵ On average the livestock spend between 50 to 120 days in a feedlot, depending on their breed and the desired outcomes. At the feedlot, the grains diet provides them with high levels of nutrition for optimal growth which can be difficult to obtain from grasses and pastures in the paddocks, particularly during periods of drought. Through implementation of feedlots, the beef industry is able to supply a consistent quality product all year round, regardless of environmental conditions.

The key benefit of this opportunity for the Mount Isa region is the ability to remove weaners during round one or two of mustering, thus removing pressure from both breeders and the pasture. This would allow graziers to manage weaner growth rates, for the purpose of achieving either an ideal target weight or a specified time of sale. This proposal does not advocate for a large-scale feedlot for fattening-finishing cattle, as the Mount Isa region is unlikely to compete with the comparative advantage of climatic conditions in more temperate zones (e.g., Southeast Queensland).

The opportunity to implement supplementary feeding methods and on-farm feedlots on grazing properties within the MICC region sits under priority one of the Agriculture Strategy, as it would support the existing strength of the beef industry within the area. Combining this with other opportunities such as irrigated forage support crops would drastically improve the economic viability of this project through a consistent local supply of fodder.

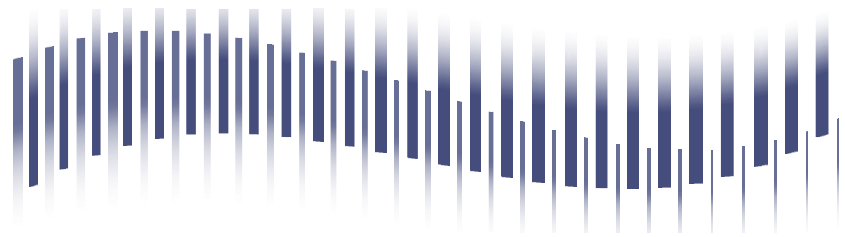
Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
2	2	2	2	1

This option has been identified as the third preference option resulting from the MCA process, with each of the assessed criteria scoring a maximum value except for *Criteria 4 - Cultural Impact* which scored a 1 due to current graziers having to update their current business models to implement these initiatives.

⁶⁴ Meat & Livestock Australia (MLA). *Supplementary feeding*. Accessed at <https://www.mla.com.au/research-and-development/livestock-production/livestock-nutrition/supplementary-feeding/>

⁶⁵ Australian Good Meat. *The role of feedlots in the Australian beef industry*. Accessed at <https://www.goodmeat.com.au/animal-health-welfare/feedlot/>



The potential advantage to having established alternative feeding options in periods of drought, allows the beef industry to produce all year round, without having to sell or transport cattle long distances.

Production information

Supplementary feeding methods require inputs from certain suppliers and is dependent on the type of feed required for the desired production objectives. Common feed types used in supplementary feeding include:

- **Energy:** grain, molasses, silage.
- **Protein:** meals such as cotton seed meal, lupins, silage.
- **Roughage:** hay, silage.
- **Minerals:** lime fed as calcium carbonate (CaCO₃), phosphorus (minerals are best fed as pre-prepared licks to ensure that livestock do not exceed recommended intakes).

Seeking professional advice and analysis of suspected deficiencies and nutrition is strongly recommended as this is a highly specialised area.⁶⁶

Site selection, layout, water supply, requirements and quality, energy and earthworks are all key factors when designing the feedlot and the required facilities. Feedlot facilities include livestock handling, receival and dispatch facility, processing facility, cattle crushes, office and amenities, truck weighbridges, feed preparation and commodity storage, grain storage, recovery pens, fuel and gas storage, chemical storage, mechanical workshops and cattle wash facilities. However, the requirements of these facilities may differ depending on the size and if the on-farm feedlot is not required to meet commercial standards.⁶⁷

Due to the complexities involved and expertise required to set-up an on-farm feedlot of this kind within the remote MICC, it is first important to educate current grazing operators within the region of the benefits and risks associated with this potential on-farm opportunity.

Economic information

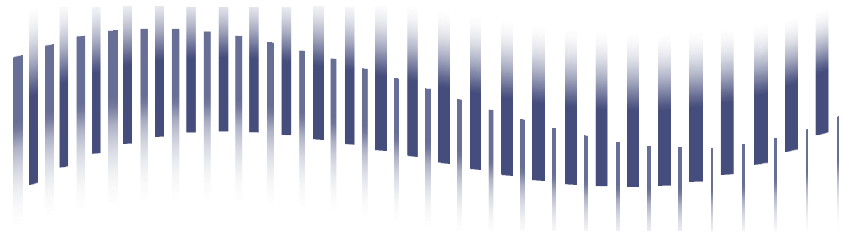
As mentioned above, supplementary feeding is a method used to feed cattle particularly throughout times of drought depending on the business objective and seasonal conditions. Drought can last for a prolonged period of time which can create significant financial distress among grazing businesses who typically rely on traditional grazing methods. Taking corrective action based on an assessment of the benefits and costs of supplementary feed is essential as it is often costly and can sometimes require involvement of an on-farm nutritionist to assist in advising rations etc. For example, if the number of days of available feed exceeds that required, options for utilising the extra feed include increasing stock numbers on pasture or conserving the excess pasture by making silage or hay. Or, if the number of days of available feed is less than required to meet targets, decrease stock numbers on pasture or be prepared to supplementary feed.⁶⁸ Pricing of feed reflects availability of the product and the quantity required. There is a lot of medium to low quality hay and silage on the market. If considering purchasing large quantities, it is important to request a feed quality test as this is the only informed way you can be sure if the product is going to be cost effective due to the nutritional value by volume of the product. Low quality hay or silage is often going to require additional energy and protein to ensure cattle rumen function and intakes remain adequate and this adds cost. Large square bales are the most cost effective to freight over distance.⁶⁹

⁶⁶ Meat & Livestock Australia (MLA). *Supplementary feeding*. Accessed at <https://www.mla.com.au/research-and-development/livestock-production/livestock-nutrition/supplementary-feeding/>

⁶⁷ Meat & Livestock Australia (MLA). *Beef cattle feedlots: design and construction*. Accessed at <https://www.mla.com.au/globalassets/mla-corporate/research-and-development/program-areas/feeding-finishing-and-nutrition/feedlot-design-manual/design-manual.pdf>

⁶⁸ Meat & Livestock Australia (MLA). *Supplementary feeding*. Accessed at <https://www.mla.com.au/research-and-development/livestock-production/livestock-nutrition/supplementary-feeding/>

⁶⁹ NSW Government. *Supplementary Feed Options Update July 2023*. Accessed at https://www.lis.nsw.gov.au/_data/assets/pdf_file/0010/1469530/NC-feed-prices-July2023.pdf



Caveat: The below prices in Table 12 are effective as at July 2023 compiled by the NSW Government's Local Land Services team. These costs should be considered indicative only and not used as a basis for investment decisions. These costs are not inclusive of freight to Mount Isa. Current pricing information should be sought at the time of any investment decision.

Table 12: Supplementary Feed Costs⁷⁰

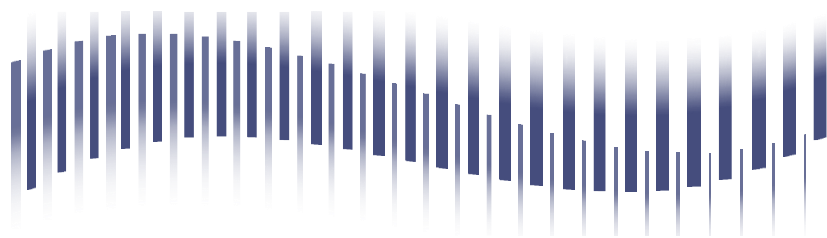
Commodity	Price Range (ex GST) as at July 2023
Cotton Seed Meal	20kg bags \$1,220/t
Molasses	\$450/ton in 1 ton module
Liquid supplements (Molasses + Protein)	\$ 0.68 to 0.85 / kg or for products that sell by the litre, \$1.20 / L
Loose Licks (Protein based)	\$1,600/ton 25kg bags
Feed Lot meal/pellets	\$550 to 590/ton
Whole Barley	\$470/ton
Sorghum	\$460/ton
Wheat	\$485/ton
Cereal Hay	\$420 to 568/ton
Lucerne Hay	\$570 to 600+/ton
Sorghum Hay	\$295 to 320/ton
Silage various options	\$100 to 150+ / 4x4 bale

In regards to feedlots, almost four per cent of Australian cattle are in feedlots at any given time, with livestock spending an average of 50-120 days in a feedlot, depending on their breed and consumer tastes for qualities such as marbling. The Australian feedlot industry is very important to the Australian economy. In 2017, the industry contributed \$4.4 billion to gross domestic product and over 30,000 jobs with most feedlots family-owned businesses committed to ensuring animal wellbeing. For existing graziers to pursue the opportunity of on-farm feedlots within their business model, we recommend a suitable expert consultant be allocated and encourage those to seek funding through available sources of capital from relevant government agencies such as the Department of State Development and Infrastructure.

Case Study

Throughout the engagement and during stakeholder consultations, large agricultural corporate companies who operate in the area expressed their support and validation of this opportunity. One in particular stated that they have large parcels of land within the MICC region that they would be willing to use for a feasibility study on developing on-farm upgrades to support cattle in proximity to the region. This company has conducted studies in the past however would be willing to participate again if spearheaded by government.

⁷⁰ NSW Government. Supplementary Feed Options Update July 2023. Accessed at https://www.lis.nsw.gov.au/_data/assets/pdf_file/0010/1469530/NC-feed-prices-July2023.pdf.



8.2.4 Bush Hay

The opportunity

Bush hay refers to the process of harvesting, storage and distribution of native pasture grasses, which generally display sound nutritional properties, and grow in abundance with little need for human intervention. While native pasture grasses are generally utilised as a resource for feeding cattle on property, with the appropriate management a commercial opportunity may be present for large scale distribution of the product. This opportunity supports *priority two* of the Agriculture Strategy. For the purpose of assessing this opportunity, the focus will be placed on Mitchell grass.

- **Mitchell grass:** a long-life perennial grass which is common in the Mount Isa region. Mitchell grass has a dual root system which allows it to make efficient use of moisture both from small periods of rainfall, and subsoil moisture. It is well adapted to high temperatures and is drought tolerant⁷¹.

The clear comparative advantage for the Mount Isa region in the production of bush hay is twofold. First, the scale of the grazing industry in the region (see *Mount Isa Transformation - Agriculture Profile*) ensures that there will be a constant stream of demand for supplementary fodder, particularly during periods of harsh environmental conditions (e.g., drought). In synergy with these market demand patterns, native grasses (and their eventual production into bush hay) is less dependent on rainfall, or irrigation as a supplementary measure, than other cropping solutions. While moderate, reliable rainfall is ideal for the growth of these native grasses, in many cases a viable product can still be harvested or used for local grazing even when rainfall fails to meet expectations.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
2	1	0	2	2

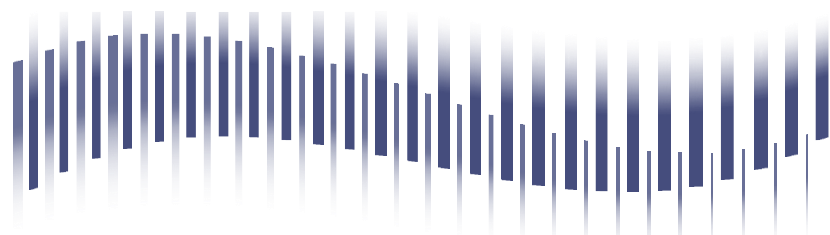
Bush hay production scored strongly across most categories and is considered a promising opportunity for further development.

The distinct comparative advantage for bush hay shares similarities with irrigated forage support crops. Bush hay would have a direct pipeline from production to use in a hyper-local market (Mount Isa and direct neighbouring regions). Due to the size of the grazing industry in Mount Isa and across northwest Queensland, there is a strong demand for forage support crops. The transition to increased cropping activity, while not a historic feature of Mount Isa’s agriculture sector, is considered a positive factor noting the overall project’s focus on diversification and growth of the economy. This change in focus is likely to lead to greater self-sufficiency of the existing market for grazing production, and reduced costs for local operators.

While there are a number of strengths inherent to the bush hay production opportunity, there are some challenges that would need to be mitigated in order to achieve a successful commercial production of the product. The expected yield of a bush hay production is naturally less than that of an irrigated forage crop solution. The reliance on variable rainfall patterns, as opposed to a reliable mechanical irrigation strategy means that during times of drought, yield should be expected to decrease⁷². As a result, over the long-term life of the crop, there will be years in which production value decreases, or is non-existent. The mitigation for this risk comes in the hearty nature of the crop itself. Mitchell grass for example can grow under harsh conditions, and even a small amount of production can be valuable as a forage crop, especially in drought times when graziers have the most difficulty securing feed.

⁷¹ Department of Primary Industries and Fisheries, 2008. *Mitchell grass factsheet*. Accessed at: https://keys.lucidcentral.org/keys/v3/pastures/Html/Mitchell_grasses.htm

⁷² Department of Agriculture and Fisheries, 1996. *Managing Mitchell grass a graziers guide*. Accessed at: https://era.daf.qld.gov.au/id/eprint/8759/1/managing_mitchell_grass_a_graziers_guide-LR.pdf



The economic viability of bush hay production should be subject to further investigation and is not as well defined as that of other forage crops, due to the comparatively low nutrient density and desirability of the native pasture grasses as a fodder resource. Production and sale of bush hay is much less common than that of irrigated forage crops like sorghum, maize and Rhodes grass. While the value is lower, the resilience of the crop makes it a strong choice for harsh climates, especially when combatting high logistics costs of obtained forage crops from the south of Australia. Ultimately, any forage crop available under times of drought and economic uncertainty in the grazing industry will be desirable, and result in an increased demand.

Production information

Using Mitchell grass as an example of a common native grass in the area with the right nutritional profile for the target market, the below information (Table 13) outlines some key production information for the species.

Table 13: Production information for Mitchell grass

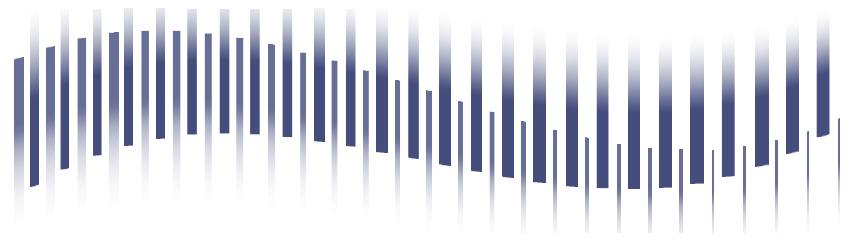
Crop	Seasonality	Water	Pests and Disease	Establishment	Animal Production Value
Mitchell grass	Warm season	Under rainfall conditions will grow well at 250-550mm annually.	Nil	Natural seedling recruitment of 1 - 5 seedling/m2 occurs generally, although exceptional seedling recruitment up to 30 seedlings/m2 has been recorded under specific seasonal conditions.	Mitchell grass is not highly palatable and will therefore grow and set seed while other grass species are eaten preferentially. The key value of Mitchell grass is to provide bulk during non-growing seasons

Economic information

Production economics

The production economics of irrigated forage crops can be highly variable dependent on environmental conditions, selected species, pest interference and many other factors. To provide some indicative information on prices of hay for relevant production markets, Dairy Australia⁷³ compiles a hay report, with contemporary pricing information for hay by the tonne, with comparisons to the previous calendar year and the rolling five-year average. This information is displayed seasonally below in Figures 23 and 24.

⁷³ Dairy Australia, 2024. *Industry Report - Hay Report*. Accessed at: <https://www.dairyaustralia.com.au/industry-reports/hay-report>



AthertonTablelands prices

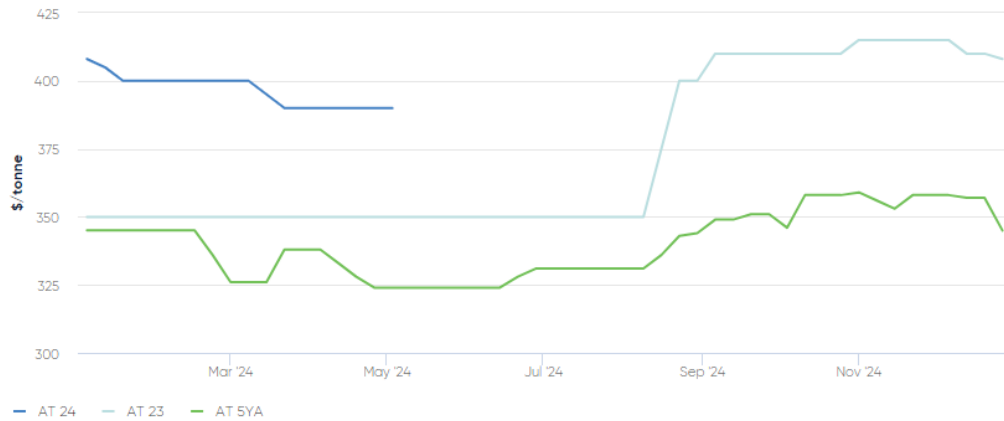


Figure 23: Hay prices from the Atherton Tablelands⁷⁴

DarlingDowns prices

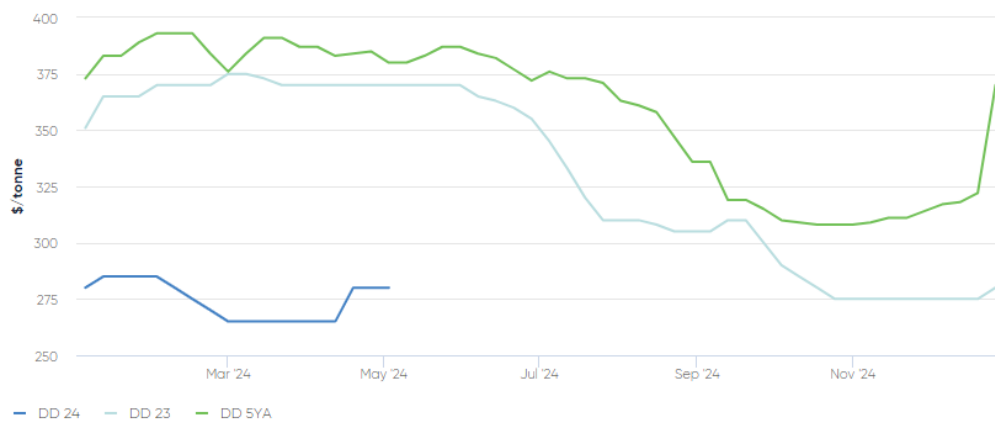


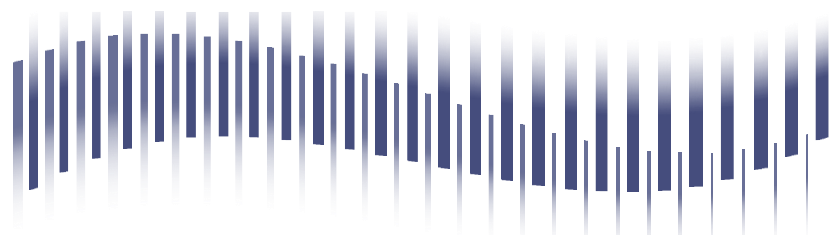
Figure 24: Hay prices from the Darling Downs⁷⁵

Business model and commercialisation

The pathway to commercialisation from a market access standpoint shares a number of similarities with the irrigated forage crop opportunity, as the target customer is the same. Again, many benefits could be gained with from a business model involving a proponent with extensive cropping experience, however this is likely to be less of a premium for bush hay due to the hearty nature and wild growth of the native grass variants.

⁷⁴ Dairy Australia, 2024. Industry Report – Hay Report. Accessed at: <https://www.dairyaustralia.com.au/industry-reports/hay-report>

⁷⁵ Ibid.



In addition to the reduced complexity of cropping operations, there is likely to be a somewhat smaller upfront infrastructure investment, due to the increased resilience and easier growing conditions of the native pasture. This is one factor that may offset the comparatively lower value by weight of the bush hay product (because of its reduced nutritional characteristics). The bush hay opportunity may pair well with an irrigated forage crop opportunity, as once the operational processes and market pathways are established, they can easily be adapted to support the much more resilient native grass crops.

Stakeholder engagement has identified that some local proponents have experience in cutting and baling bush hay, around Camooweal, at Rocklands Station, across Burnette Downs and on the Barkly Tablelands. These proponents are known to MICC and would present as an ideal starting point for further development of this commercial opportunity.

While the direct job creation from a project of this nature is expected to be minimal, the change in culture of Mount Isa’s agricultural sector to an increased cropping focus, while still enabling growth in the grazing industry, is considered a distinct advantage for this opportunity.

8.2.5 Date Palms

The opportunity

Date palms (*Phoenix dactylifera*) were first grown in Australia in the 1880s, however due to low planting stock and limited expertise in date production, expansion across Australia was restrained. The Australian date palm industry remains small today, comprising 50 commercial farming operations, predominately made up of Barhee date varieties, with a total area of about 100 hectares (approximately 44% of which is in the Riverland region of South Australia, and only 8% in Queensland across the Darling Downs and Central Queensland). Date palms are noted for their ability to deal with drought, variable water availability and heatwave conditions much better than other varieties of horticultural crops⁷⁶.

Date palms sit under *priority two* of the Agriculture Strategy and would represent a significant departure from the typical profile of the agriculture sector in the Mount Isa region, as well as accessing a relatively underdeveloped market domestically.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
2	2	0	2	1

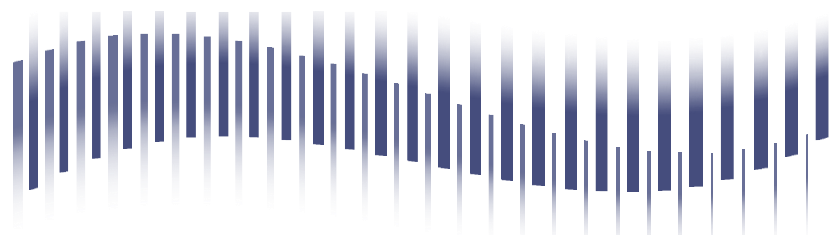
Date palms scored strongly across most categories of the MCA and are considered an opportunity with a strong potential to contribute to the economic strength and diversity of the Mount Isa region. They are a relatively untested product with respect to domestic production, however, have been identified as a potential growth market.

A distinct advantage for the Mount Isa region’s production of date palms is climatic similarity to the dominant growing regions in the middle east (see *Mount Isa Transformation - Agriculture Profile*). Date palms are able to be grown in many regions of Australia due to their resilience to climate variations and harsh conditions. With the enabling climatic conditions of the region, a strong yield (comparatively to the domestic market) can be expected.

There are strong market opportunities for dates across a number of categories in the domestic market:

- Direct to consumer sales in local regions and through online sales of the fresh product

⁷⁶AgriFutures Australia, 2022. *Australian Date Palm RD&E plan*. Accessed at: <https://agrifutures.com.au/wp-content/uploads/2022/11/22-103.pdf>



- Strong sales to capital city wholesale fresh food markets, especially in communities with a large portion of residents of Middle Eastern origin
- An extended season, with minimal seasonal risk due to the variety of locations across the country that dates can be grown.

Harvesting of dates is also a complex and labour-intensive process, which involves manual labour to prune and de-thorn the palms, hand pollinate, and harvest the pollen and fruit. While this does present as a challenge for the industry, especially in regional locations, it does contribute to the underlying needs of the Mount Isa Economic Transformation Strategy by creating employment pathways.

While there are strong indicators of the economic viability of dates, it remains an underdeveloped domestic industry, and as such caution should be exercised when considering investment in this opportunity. Trial productions and small-scale cropping is recommended to determine the long-term economic viability of the crop.

Production Information

Table 14 outlines key production information for date palms, noting this is presented at the aggregate level due to the existence of a large variety of date species.

Table 14: Production information for date palms⁷⁷

Crop	Seasonality	Water	Pests and Disease	Yield
Date palms	February to April, however somewhat capable of an extended season.	Date palms have the ability can thrive on low quality, high-salinity water which would be unsuitable for other crops. An irrigated system could be viable with 8-10ML of water per hectare.	Nil of significance.	Current domestic yields are averaging approximately 10kg per tree, however evidence from international growers suggests that up to 100kg per tree is achievable with refined management techniques. Date palms have a long lifespan in excess of 50 years under proper management.

Economic Information

While the domestic market for date palms remains relatively underdeveloped, AgriFutures Australia has compiled some relevant information on market economics for the product. This data is drawn from their strategy for the development of the domestic date palm market, which also recommends a number of strategies for improvement.

Global date production is supported extensively by the Northern Hemisphere, which produces more than nine million tonnes annually. As at 2018, Australia was importing dates at a rate of approximately 8,000 - 9,000 tonnes of fresh and dried dates per annum. In 2021 the domestic market produced approximately 100 tonnes of mixed date varieties with an approximate value of \$2 million, indicative of a substantial shortfall in domestic production⁷⁸.

⁷⁷ AgriFutures Australia, 2022. *Australian Date Palm RD&E plan*. Accessed at: <https://agrifutures.com.au/wp-content/uploads/2022/11/22-103.pdf>
⁷⁸ *ibid*

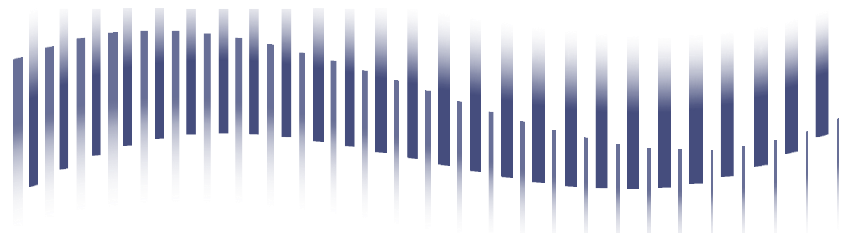


Figure 25: Fresh dates on the strand

imported “off the strand” (see Figure 25) which goes against Australian consumer preferences, and presents another advantage for Australian growers⁷⁹.

The average value of Australian dates in a retail environment is approximately \$20/kg, which combined with the above yield statistics indicates the retail value of the full yield of a date palm at \$200 with a high-end potential of up to \$2,000 assuming improvement in management techniques. The long lifespan (in excess of 50 years) of a date palm under proper management also ensures investment longevity for proponents. While the import and consumption of dried dates is popular in Australia, due to biosecurity and quarantine arrangements, only the USA (California) is permitted to export fresh dates to Australia. The Australian date season is counter-seasonal to the Californian, therefore presenting a distinct market advantage for Australian growers. Californian dates are also only allowed to be

Date palms and date production also represent downstream opportunities for the Mount Isa region with respecting to further processing and distribution. Dates can be sold in fresh, semi-dried or dried form, and therefore have greater capacity for storage and freight distribution. All stages of the drying, packing and distribution processes could be viable downstream industries for consideration in Mount Isa.

8.2.6 Citrus

The opportunity

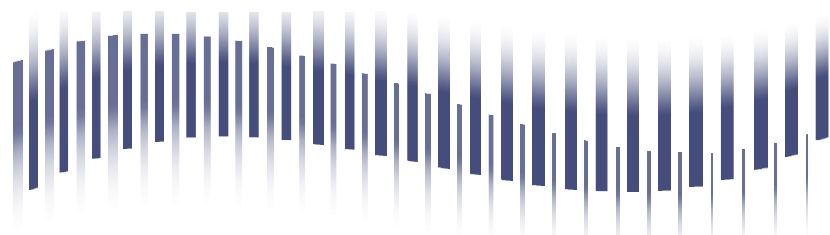
Citrus fruits include lemon, lime, orange, tangerine, grapefruit and citron. Traditionally the citrus varieties are native to Asia and are grown in warm climates. In Australia, there are approximately 1,500 citrus growers that farm on approximately 27,000 hectares of land. Citrus Australia’s 2019-20 census revealed the area under cultivation for each major commodity is:

- Navel Oranges - 10,338 hectares
- Valencia Oranges - 6,419 hectares
- Mandarins - 7,465 hectares
- Lemons - 1,714 hectares
- Grapefruit - 375 hectares; and
- Lime - 595 hectares.

Major production regions identified included:

- South Australia Riverland region (5,405 hectares)
- New South Wales Riverina region (8,155 hectares)
- Victoria/New South Wales Sunraysia region (5,605 hectares)
- Queensland Central Burnett region (4,254 hectares)
- Western Australia (1,028 hectares); and

⁷⁹ AgriFutures Australia, 2022. *Australian Date Palm RD&E plan*. Accessed at: <https://agrifutures.com.au/wp-content/uploads/2022/11/22-103.pdf>



- Other regions including coastal NSW, QLD and NT (1,379 hectares).

The Citrus industry is the largest fresh fruit export industry in Australia with a reported 261,000 tonnes of citrus exported in 2020 to a value of \$A481 million. The key export markets include China, Japan, Hong Kong, Indonesia, Singapore, United States, Malaysia, and Thailand.⁸⁰ The most likely candidates for cultivation in the Mount Isa region are lemons, limes and mandarins.

This opportunity supports *priority two* of the Agriculture Strategy and would represent a shift in the industry from beef production to include a new industry.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
1	1	1	1	2

This option has been identified as the sixth preference option resulting from the MCA process, with each of the assessed criteria scoring a value of 1 except for Criteria 4 - Cultural Impact which scored a 2 due to the identification of low implementation efforts expected due to the accompanying skillsets that exist domestically and upskilling opportunity for local staff.

While Citrus can be productively grown in the region, assuming adequate water availability, it is not one of the strongest potential options with respect to Environment and Yield. In addition, Australia already has a well-developed domestic and export market for citrus, as such, new entries into the market would be forced into strong competition with establishing growing areas, many of which feature more favourable climatic conditions.

The cultural impact of introducing citrus production to Mount Isa is expected to be quite high. The region has not previously housed a large-scale intensive agriculture project of this nature and would be effective at diversifying the skillset of the region. While it is a new concept for Mount Isa, there are a number of providers in Australia with the established skillset to run a very efficient citrus production. The complexity of establishing the industry is likely to be low, as the most effective means to do so would be importing seasoned producers from other regions.

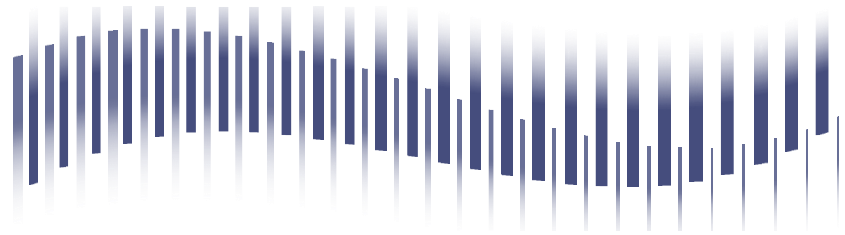
Production information

Citrus orchard production management is essential from planning through to harvest to ensure the best marketable yield can be achieved. This includes orchard establishment, irrigation, nutrition, canopy management and orchard protection.

Site suitability for citrus orchards requires the following characteristics:

- Good drainage
- Appropriate soil
- Water availability
- Road access; and
- Power.

⁸⁰ Citrus Australia. *Letter to Department of Agriculture and Water Resources* (June 2021). Accessed at <https://www.agriculture.gov.au/sites/default/files/documents/submission8-citrus-australia-limited.pdf>



Wind blemish is also one of the biggest factors known to downgrade the quality of citrus fruits, particularly in Western Australia. Windbreaks need to be managed (water, fertilise and pruned) and installed correctly ensuring spacing between trees and distance between rows.

Citrus plantations can attract significant diseases and viruses which can have the potential to affect the crop yield and spread to other orchards without proper biosecurity practices in place. It is recommended to invest in certified materials when acquiring new trees. Although these trees might incur higher initial expenses, the potential consequences, including decreased productivity and even complete orchard loss, outweigh the upfront costs when considering wasted resources like water, energy, and labour.⁸¹

Australia remains relatively free from serious pests and diseases of citrus, but biosecurity threats remain a concern. In the past, the citrus industry has been affected by three critical quarantine incidents. In 2004, citrus canker (see Figure 26) was detected in Emerald, Queensland and later discovered on other properties. This caused serious disruption to the trade in citrus from Queensland into both domestic and international markets as the regions entire plantings were destroy and it took growers over a decade to rebuild and recover. In 2018, citrus canker was detected again, in the Northern Territory but not before it had already spread to Western Australia. The 3-year eradication program has cost government more than \$19million, of which growers will be required to repay up to \$3.9million via an extraordinary levy.⁸² In 1995, Oriental fruit fly was detected in Far North Queensland and significantly disrupted the industry. The eradication campaign cost up to \$34 million and saw countries like Japan prohibit the entry of Queensland produce due to the incursion.⁸³



Figure 26: Citrus Canker

Rootstock selection is very important as it will ultimately impact on the profitability of the orchard. It is recommended a market assessment is undertaken before selecting the fruit varieties to ensure the regions climate and consumer demand is relevant. Ensure that the varieties chosen can meet the necessary maturity standards and opt for a blend of varieties with varying maturity periods to manage at peak times such as harvest.

Orchard monitoring is also essential throughout the lifecycle of the orchards including pest and disease, flowering and growth stages, fruit size, water use, crop load estimation, management practices and actual yield and pack out.⁸⁴

Economic information

The 2023 season for the Australian citrus industry brought about notable improvements despite encountering challenges. Citrus Australia CEO Nathan Hancock highlighted enhancements in fruit quality compared to the previous year. While early-season fruit faced challenges due to weather conditions, mid- and late-season varieties exhibited better quality. Despite a heavy crop, fruit sizing improved overall. Mandarin production expanded, albeit with mixed results, leading to earlier exports. However, production costs remained high due to various factors including rising input prices and labour shortages. The sector also faced transport and logistics challenges domestically and internationally. Despite these hurdles, there was improved trade conditions globally, with China remaining a key market. Emerging markets like South Korea and Vietnam showed promise, while efforts to capitalize on the Australia-India trade agreement are ongoing. Overall, the industry is moving towards positive outcomes, with expectations of a better season than the previous year for 2024.⁸⁵

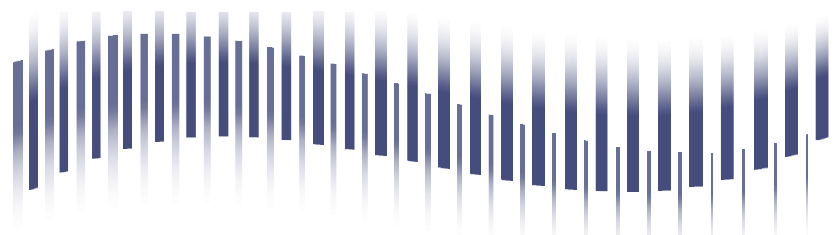
⁸¹ Government of Western Australia, Department of Primary Industries and Regional Development. *Citrus orchard management*. (January, 2017). Accessed at <https://www.agric.wa.gov.au/citrus/citrus-orchard-management>

⁸² Citrus Australia. *Letter to Department of Agriculture and Water Resources* (June 2021). Accessed at <https://www.agriculture.gov.au/sites/default/files/documents/submission8-citrus-australia-limited.pdf>

⁸³ Ibid.

⁸⁴ Government of Western Australia, Department of Primary Industries and Regional Development. *Citrus orchard management*. (January, 2017). Accessed at <https://www.agric.wa.gov.au/citrus/citrus-orchard-management>

⁸⁵ Citrus Australia. *Promising signs for Australian citrus*. (September 2023). Accessed at <https://citrusaustralia.com.au/media-release/2023/09/promising-signs-for-australian-citrus/>



8.2.7 Spinifex Grass

The opportunity

Spinifex grass (see Figure 27) is a tussock forming grass which is endemic to Australia. Spinifex is commonly found in arid regions which are characteristic of the Australian outback, it is found growing on low-nutrient soils of sand plains and low rocky mountain ranges, but also occurs on rocky outcrops along the coasts.

Spinifex grasses can be divided into two groups known as ‘hard’ and ‘soft’ spinifexes. The main difference is that the hard spinifex group does not contain resin, usually forming dense circular hummocks of rigid spiny leaves. They sometimes grow outwards with age into rings measuring 2-3 metres across, usually with a bare or dead centre. The soft spinifexes are less densely packed, have less spiny leaves and form a continuous cover like tussock grasses. They also frequently exude sticky resin from the stems and leaves, contributing to the intensity of some of the outback grass fires⁸⁶.



Figure 27: Spinifex grass

The commercial harvesting of Spinifex grass in order to utilise its by-products sits under *priority two* of the Agriculture Strategy. While Spinifex grass is common in the area, there is no well-developed commercial operation for harvesting. The introduction of a cropping opportunity with significant downstream product opportunities has the potential to be a strong contributor to the Mount Isa economy.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
2	2	0	0	1

The primary comparative advantage for the commercial production of spinifex grass and the associated by-products is that the environment in Mount Isa is highly conducive to productive growth of the crop. Spinifex grass grows in abundance without intervention across the Mount Isa region, removing the necessity for complex irrigation systems, high quality soil and other onerous management techniques. While many cropping management techniques can be employed to increase the production yield, there can be confidence that even without intervention, and in times of harsh climatic conditions, spinifex grass will continue to grow.

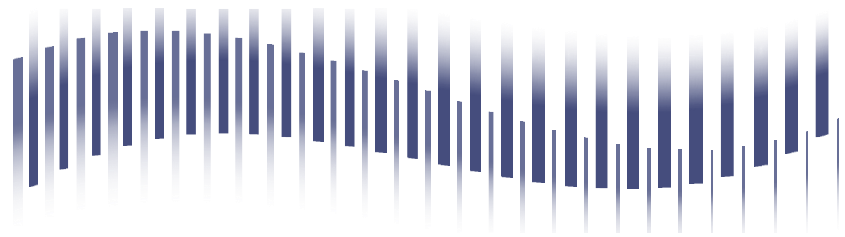
Another distinct advantage of spinifex grass cultivation is the cultural impact and potential employment pathways for First Nations Australians. First Nations Australians have been harvesting spinifex grass for tens of thousands of years, it has previously been used in a range of craft and construction activities, for example, building shelters, making beds and as glue in making instruments like spears and boomerangs. For current trials, harvesting spinifex grass has been a way to combine traditional First Nations farming methods and knowledge of sustainable practice, with cutting edge science and research methodologies⁸⁷.

“Spinifex grass is an ancient and sacred material to Indigenous people, but also a material we use all the time.”

- Colin Saltmere, MD of Dugalunji Aboriginal Corporation and Indjalandji-Dhidhanu man.

⁸⁶ AusEMade, 2024. *Spinifex*. Accessed at: <https://ausemade.com.au/flora-fauna/flora/spinifex-triodia/>

⁸⁷ University of Queensland, 2024. *Indigenous opportunity sprouts from desert discovery*. Accessed at: <https://www.uq.edu.au/research/impact/stories/indigenous-opportunity-sprouts-from-desert-discovery/>



The key to the economic pathways presented by spinifex grass lies in its naturally produced nanofibers, which have a variety of commercial and medical uses. Working in partnership with the Indjalandji-Dhidhanu People, scientists from UQ's Australian Institute for Bioengineering and Nanotechnology have developed a method of extracting nanofibers from spinifex. While the work is currently in a trial phase, with limited market development, it is already attracting outside investment⁸⁸. Further work is required to determine the extent of uses for spinifex nanofibers, and what the commercial upside for these products may be.

Production Information

Spinifex grass itself is found abundantly across outback and coastal Australia (varying sub-species), it requires little water, can withstand high heat and is tolerant of low-quality soil. Spinifex grass can be harvested naturally, a practice employed by First Nations Australians for generations, it can then be processed at a central point to create the high demand by-products for further distribution. This process represents an opportunity to enhance employment prospects for people in remote communities across Northern and Central Australia⁸⁹.

Spinifex grass is processed into nanofibers by first washing the grass in hot water, then drying and grinding it into a powder where the nanofibers can be isolated. The grass powder is treated with a mild alkaline solution to loosen its structure before it is deconstructed using a high-pressure homogeniser. These nanofibers, either in powder form or dispersed in water, are then mixed with other materials such as rubbers, latex or cardboards to improve their strength while retaining flexibility and stretchiness⁹⁰.

Some example use cases for spinifex nanofibers or resin are below⁹¹:

- **Cardboard:** Reinforcement of recycled cardboards with tough spinifex nanofibers improves its strength, which generally decreases in the recycling process.
- **Filters:** Using spinifex nanofiber as a water filter significantly improves the removal of metal ions in water. The hemicellulose on the surface of nanofibers works as absorption cage to trap metal ions.
- **Elastomers and Polymers:** Adding just a small amount of spinifex nanofibers into different types of rubber results in a significant improvement in the strength of rubbers without reduction of their resilience and flexibility. Spinifex nanofibers are both tougher and softer than typical reinforcing agents used in rubber such as silica, carbon black, carbon nanotubes and graphene.
- **Concrete:** Spinifex nanofiber has shown to increase the strength of cement by at least 20 per cent. This results in either a reduction to cement usage, or the ability to make thinner structures at equal strength.
- **Medical gel:** Spinifex gel has a uniquely low water content and as such can be used in much lower concentrations to create a more effective gel for use in a wide variety of applications including arthritis and aiding the injection of other drugs across the medical and cosmetic industries.

Economic information

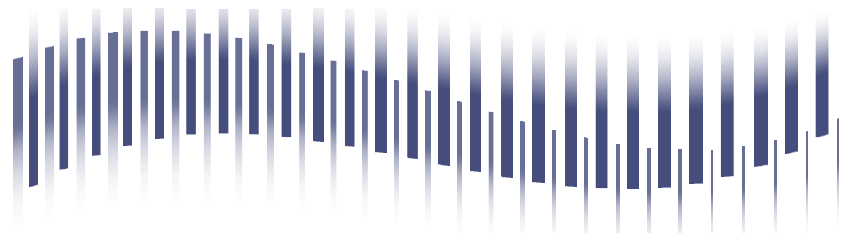
The broader economic implications of a commercial spinifex grass production opportunity are currently unknown, due to the early-stage trials of spinifex nanofiber cultivation and downstream production. Spinifex nanofibers are broadly applicable across several high value industries, including packaging, automotive, aerospace, healthcare, energy, food, cosmetics and environmental health sectors that all involve petroleum-based polymers.

⁸⁸ ABC North West Queensland, 2023. *Medical gels made from spinifex grass to provide 'safer' treatments, jobs for Indigenous Australians*. Accessed at: <https://amp.abc.net.au/article/102050068>

⁸⁹ University of Queensland, 2024. *Indigenous opportunity sprouts from desert discovery*. Accessed at: <https://www.uq.edu.au/research/impact/stories/indigenous-opportunity-sprouts-from-desert-discovery/>

⁹⁰ ABC Science, 2018. *How a native desert grass can improve tyres, concrete, latex gloves and more*. Accessed at: <https://www.abc.net.au/news/science/2018-08-15/nanotechnology-spinifex-desert-grass-making-latex-stronger/10067164>

⁹¹ Ibid.



Further engagement with Colin Saltmere, as a local driver of the budding industry, is considered beneficial. Funding pathways available through the Department of State Development and Infrastructure may be useful in advancing or accelerating spinifex production trials in the region.

Case study - Spinifex resin in the medical industry⁹² (Camooweal / Brisbane, QLD)

Brisbane-based bioscience company Trioda Wilingi, which is associated with the University of Queensland, has received an investment of \$2.6 million from its shareholders to develop the medical gels using spinifex. The grass is harvested and processed in a lab at Camooweal, in north-west Queensland, where a machine, of which there are only two in Australia, extracts resins from the grass before it is shipped to Brisbane for manufacturing.

The Indigenous-owned Bulugudu organisation is the majority shareholder of Trioda Wilingi and runs the harvesting side of the operation. It is creating jobs for local First Nations people right across the production line.

"Young Indigenous people sit on our boards and have direct involvement down at the lab in Camooweal, and we employ other young Indigenous people as trainees to assist in the harvesting and collecting of spinifex."

- Colin Saltmere, MD of Dugalunji Aboriginal Corporation and Indjalandji-Dhidhanu man.

Due to the nature of the medical industry, it is expected to take some time for spinifex gel to enter a clinical trials phase, however there is optimism among proponents that the spinifex gel could be a world first, market leading product in the medical and cosmetics space. In addition, it presents an opportunity to open pathways to STEM education and employment for First Nations Australians living in remote communities.

8.2.8 Increased Stocking Rates

The opportunity

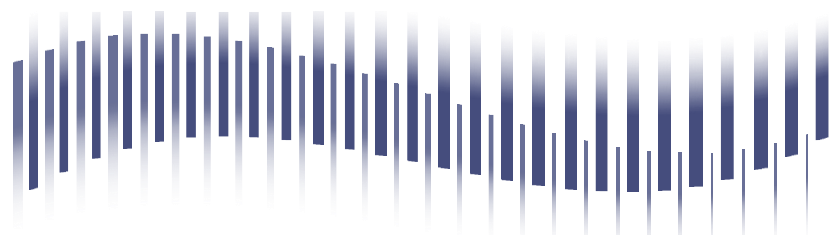
Throughout the course of stakeholder engagement, a number of small scale projects / trials were identified as planned or in flight, with the objective of increasing stocking rates for local graziers, or other general on-farm efficiency measures.

Stocking rates refer to the quantity of livestock present in a paddock or on a whole property, typically expressed as an indication of the number of cattle per unit area. The usual measure for cattle is Adult Equivalent (AE) per hectare (ha). The standard animal used for the AE standard is a 2.25 year old, 450 kg *Bos taurus* steer at maintenance grazing on pasture with diet quality of 7.75 MJ ME/kg DM and walking seven kilometres each day. MJ ME/kg DM is a reference to the energy density of feed, measured as megajoules of metabolisable energy per kg of dry matter. Subsequent calculations express the energy demand of various animals relative to this standard unit.

Physical activity, specifically the daily distance covered by cattle, impacts their energy requirements. An examination of previous studies on cattle movement revealed that regardless of the paddock size or configuration, cattle tend to cover a consistent distance daily. This suggests that the daily distance travelled by cattle can be standardised, making it applicable across various regions in northern Australia.⁹³ Graziers in the Mount Isa region, in conjunction with Southern Gulf NRM, have trialled the installation of additional water points and novel fencing configurations to

⁹² ABC North West Queensland, 2023. *Medical gels made from spinifex grass to provide 'safer' treatments, jobs for Indigenous Australians*. Accessed at: <https://amp.abc.net.au/article/102050068>

⁹³ Meat & Livestock Australia (MLA). *Adult Equivalent Methodology A methodology to accurately and consistently calculate cattle grazing loads in northern Australia*. (January 2014). Accessed at https://www.mla.com.au/contentassets/231986a1d7884926bee55a0e0615ecc1/b.nbp.0779_final_report.pdf



reduce the activity of their cattle. Minimising cattle activity results in higher live weight gain, less pastoral damage, higher pasture utilisation and an overall more efficient and profitable grazing operation.

One of the critical drivers of success in an agricultural grazing business is production levels and how Stocking Rates can be matched with Carrying Capacity (SR:CC). Stocking Rate reflects the feed supply demand, accounting for the number of livestock and the total herd size. Carrying Capacity, on the other hand, indicates the feed quantity available, influenced by both pasture quality and quantity.⁹⁴

Increases to the stocking rate and carrying capacity can be achieved by ensuring pasture receives adequate rest and grazing for desired species. This management approach will enhance pasture composition, leading to improved soil structure and microbial activity below the surface. Consequently, there will be an increase in ground cover and availability of quality pasture across different seasons, bolstering landscape resilience. Moreover, it fosters the development of root mass, enabling better access to water and nutrients within a broader soil profile. By bolstering environmental resilience and maintaining pastures for varied rainfall patterns, overall ecosystem health can improve, consequently raising the landscape's carrying capacity and allowing for the management of more livestock.⁹⁵

The opportunity to increase stocking rates on farm within the MICC region sits under *priority one* of the Agriculture Strategy, as it would support the existing strength of the beef industry within the area.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
1	1	1	1	1

This option has been identified as the seventh preference option resulting from the MCA process, with each of the assessed criteria scoring a value of 1 due to current graziers potentially needing to update their current grazing methods.

The potential advantage to introducing new grazing methods in the MICC region will contribute to strengthening the already existing beef industry in Northern Queensland. Figuring out the optimal stock numbers while navigating the variable rainfall patterns in northern Australia has consistently posed challenges. Producers often grapple with the dilemma of whether to increase stocking rates for greater profitability or maintain sustainable pasture over the long haul.

It is recommended additional engagement with Southern Gulf NRM, and local landholders is undertaken for the coordination and advocacy of educating producers within the MICC region. This additional engagement is likely to identify initiatives that would be suitable candidates for funding by DSDI.

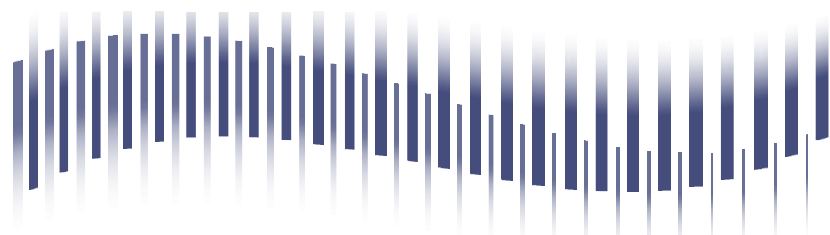
Case Study - Wambiana Grazing Trial

MLA funded a trial on a family cattle property 'Wambiana', 70km south of Charters Towers where the long-term average rainfall is 630mm but can range anywhere from 207 to 1,409mm. Dr Peter O'Reagain, from the Queensland Department of Agriculture and Fisheries (DAF) was the project leader over an 18-year period and has determined what the best grazing strategy is to achieve both profitability and sustainability. Dr Peter O'Reagain stated that *"the long-term results from the trial, over a range of some of the wettest and driest years on record, clearly show the commonly-held perception, that you need to stock relatively heavily to be financially viable, is wrong"*.

The research team compared five grazing strategies over the period:

- **Heavy stocking rate:** constant stocking at about twice the long-term carrying capacity (4ha/AE)

⁹⁴ RCS Australia. *How to Improve Production in Your Agriculture Business*. Accessed at <https://www.rcaustralia.com.au/improve-production/>
⁹⁵ Ibid.



- **Moderate stocking rate:** constant stocking at about the long-term carrying capacity (8ha/AE)
- **Rotational wet season spelling:** constant moderate stocking at about 8ha/AE with a third of the area wet-season spelled each year
- **Variable stocking:** stocking rates adjusted annually in May based on pasture availability at the end of the wet season (range 3-12ha/AE)
- **Southern Oscillation Index (SOI)-variable stocking:** stocking rates adjusted in November based on available pasture and SOI seasonal forecasts (range 4-12ha/AE).

John Bushell, the senior technician overseeing the trial, stated that the aim was to evaluate how various approaches responded to the variable rainfall conditions, assessing their impact on animal productivity, financial viability, and land health. The goal was to identify the most effective strategies for managing this demanding environment.

The study found that the heavy stocking rate made the least profit overall, caused the most severe pasture degradation and led to a major loss of resilience. Although it did make profit in individual wet years, however was well and truly undermined in dry years by drought-feeding costs, higher interest costs on livestock capital and reduced product value through poorer animal condition. In contrast, moderately stocked strategies or those that cut stocking rates with the onset of drought (i.e., the variable and SOI strategies) largely avoided these costs and were far more profitable over the long term.

The 18-year trial found that the least profitable and unsustainable stocking strategy was the heavy stocking strategy however each of the strategies had shortcomings. The optimum strategy recommended was to involve flexible stocking around long-term carrying capacity, as seasons vary, with periodic wet season spelling.⁹⁶

The primary task of a grazer is to efficiently convert available pasture into live weight gain while at the same time ensuring long term damage to the pasture does not occur. Increasing live weight gain by managing animal movement on a daily basis can be one component to a wholistic strategy to balancing stocking rate against available feed and to maximise the conversion of pasture to animal protein.

8.2.9 School Based Apprenticeships, Business Development Opportunities and Educational Opportunities

The opportunity

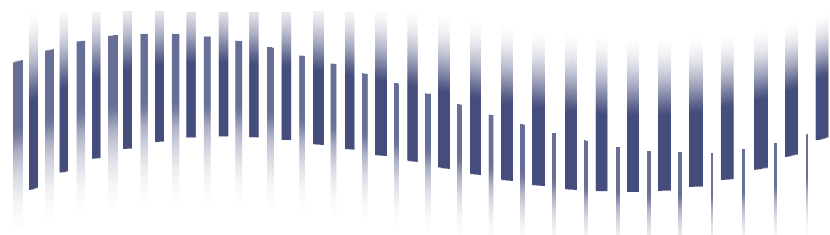
This section highlights a number of non-production opportunities which support *priority three* of the Agriculture Strategy. During the course of Scyne Advisory’s engagement with the Mt Isa community, across a variety of industries, a number of opportunities have presented as a necessary or potentially beneficial initiative to implement in the region.

The opportunities supporting *priority three* have a more indirect impact on the productivity of the grazing industry, however numerous stakeholders have identified that they are valuable initiatives, not currently available in the region.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
1	1	1	1	1

⁹⁶ Meat & Livestock Australia (MLA). *Stocking rates - no more trial and error*. Accessed at: <https://www.mla.com.au/news-and-events/industry-news/archived/2016/stocking-rates-no-more-trial-and-error/>



This opportunity scored well across the board, and while it is acknowledged that this will not be a transformative, large-scale impact on the agriculture industry or Mount Isa’s economy directly, there are a number of quick wins that can be achieved under this category of opportunities. As this is a non-production opportunity, the interpretation of assessment criteria has been adjusted to fit the specific details of this opportunity, while retaining the intent of the assessment criteria as they were developed.

This opportunity scored well in environment due to the strength of the agriculture sector in Mount Isa. As a result, there is considered a substantial need and market for the introduction of a series of workshops / networking events in the region. It is also expected that a renewed focus on innovation, education and network could have a lasting cultural impact on the agriculture sector in Mount Isa.

School based apprenticeships

School based apprenticeships in the agriculture sector can offer a wide variety of benefits to students by bridging the gap between academic learning, and practical, hands-on experience. By integrating real world agriculture work with their studies, students can gain an understanding of the requirements and challenges of the industry. School based apprenticeships also give students a head-start on their career, with the ability to gain early experience in their field of choice. Currently, there is minimal collaboration between MICC, local schools and the businesses in the agriculture sector. Despite this, stakeholder consultation has identified a broad range of support for the expansion of school-based apprenticeships from government stakeholders, to some of the largest grazing operations in Northern Queensland.

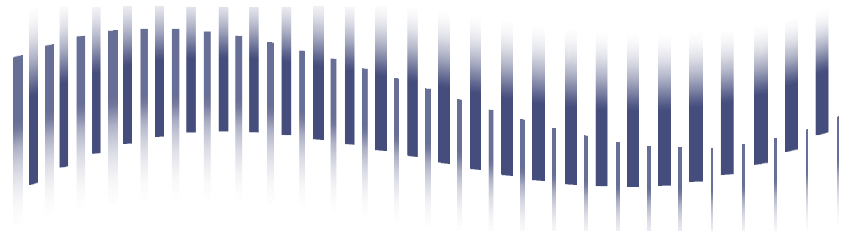
School based apprenticeships are also beneficial to employers. They assist in developing a workforce that is both knowledgeable and technically competent in the field from an early age. School based apprentices can bring innovation to the industry through technological or methodological advancements learned from their combination of academics and skilled employment. School based apprenticeships also strengthen the local community by keeping talent in rural areas. They provide young people with a reason to start and build their career locally, contributing to the economic stability of the region.

School based apprenticeships enable further education and career development in young people. Successful completion of a school-based apprenticeship can lead to direct entry to a related TAFE Queensland course. It can also contribute to a student’s Australian Tertiary Admissions Rank (ATAR) or add credits to their Queensland Certificate of Education⁹⁷.

Below is a proposed pathway to the expansion of school-based apprenticeships in the Mount Isa region:

MICC	Local graziers	Local schools	TAFE Queensland
<ul style="list-style-type: none"> - Leader of the school-based apprenticeship initiative - Creates and coordinates a strategy for engaging young people with school-based apprenticeships in the agriculture sector. - Facilitates relationships between all stakeholders. 	<ul style="list-style-type: none"> - Promote their industry and labour needs to young people. - Support field trips and work experience for students to attend working properties. - Commit, where possible, to employing local staff, especially for entry level positions. 	<ul style="list-style-type: none"> - Promote school-based apprenticeships to students. - Allow and facilitate educational field trips and work experience programs for students. - Support and promote agricultural training pathways and career development. 	<ul style="list-style-type: none"> - Provide support to schools and workplaces with training modules. - Engage proactively with students to provide information on education and career pathways within the agriculture sector.

⁹⁷ TAFE Queensland, 2024. *School based apprenticeships and traineeships*. Accessed at: <https://tafeqld.edu.au/courses/ways-to-study/tafe-at-school/school-based-apprenticeship-traineeship>



Business development and educational opportunities

During stakeholder consultation sessions, it was identified that many local graziers are unsure where to access information on matters which impact them. Common examples were land tenure, regulatory matters (including water access rights and biosecurity) and access to funding / relief measures. Despite the confusion among local industry members, government stakeholders indicated that in many instances these matters are not complex, and information is available. It is clear that there is a disconnect with the outreach efforts of government departments in the local community, and this opportunity is a potential means to address these concerns.

In addition to these educational opportunities, industry stakeholders who attended the consultation workshop remarked that there is rarely an opportunity to connect with other members of the industry to share ideas or participate in networking opportunities. This lack of connection also raises concerns around the general availability of support networks for people in the agriculture industry, and the impact this has on mental health. The National Farmer Wellbeing Report, commissioned by Norco, indicates that nearly half of Australian farmers (45%) have felt depressed, with almost two thirds (64%) experiencing anxiety. For one in seven (14%), it's a frequent experience. Of even greater concern close to half of Australian farmers (45%) have had thoughts of self-harm or suicide, while close to a third (30%) have attempted self-harm or suicide⁹⁸.

The proposed solution to these concerns is the introduction of a Mount Isa agriculture sector speaker series. It is envisaged that this could be facilitated by the MICC, with the help of state government agencies like the Department of Agriculture and Fisheries or the Department of Regional Development, Manufacturing and Water. They could also feature prominent businesspeople, researchers, and innovators in the agriculture sector, and provide a forum for networking, as well as the discussion of latest trends and innovations in the sector. Not only would this provide a forum for local farmers / graziers to receive information from reliable sources and ask questions that affect their day-to-day operations, but it would also provide an opportunity for them to forge valuable personal connections with others in the industry.

It is recommended that MICC use their existing contacts, to determine which topics would be of relevance to the local community and engage with speakers with authority to speak on those matters. It is anticipated that local industry bodies, for example MITEZ and CRCNA will be helpful in both establishing a network of participants for these sections and capturing relevant topics for discussion.

8.2.10 Road Grading

The opportunity

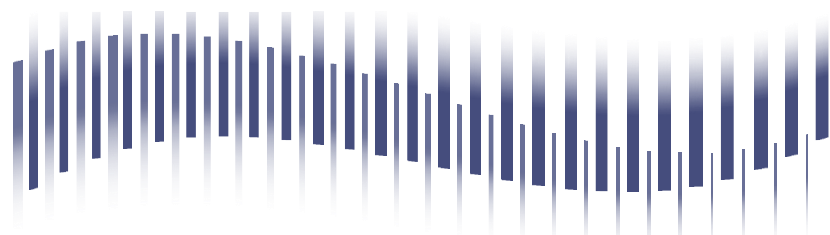
Road grading involves the utilisation of a motor grader to enhance the driving surface and drainage characteristics of roads. The operator employs techniques such as cutting the road surface or filling irregularities like washboards and potholes with material, utilising the road grader to move it back and forth across the road.

Within the MICC region there is a total of 1,798 kilometres of unsealed roads which require maintenance and road grading.⁹⁹ These roads are crucial as they connect local producers to their markets.

In examining the state of local roads, a notable contrast emerges when compared to the standard of gazetted roads. Local roads often exhibit a lower quality, due to poor maintenance and upkeep. Additionally, it is important to note that landholders are legally prohibited from independently undertaking grading activities on state roads. This regulatory constraint further highlights the necessity of government involvement in such infrastructure management. Largely, the concern with road grading for local stakeholders is the timeliness of these works. There is a perception

⁹⁸National Farmers Federation, 2023. *Farmers in crisis: Depression and anxiety rife among Aussie farmers*. Accessed at: <https://nff.org.au/media-release/farmers-in-crisis-depression-and-anxiety-rife-among-aussie-farmers/>

⁹⁹ Mount Isa City Council, 2024. *Roads, Signs and Footpaths*. Accessed at: <https://www.mountisa.qld.gov.au/roads-infrastructure>



of delay from when damage occurs to local roads, to securing funding from external sources for necessary maintenance works. This represents an inefficiency in the management of these critical assets.

The consequence of poor road conditions, particularly within the MICC region extends beyond inconvenience for those reliant on sufficient transportation routes. In the case of cattle farming, the quality of roads directly impacts logistical operations, dictating when livestock can be transported to market. Consequently, graziers may find themselves in a position to sell their cattle at less-than-optimal times due to the limitations imposed by poor road conditions. This, in turn, directly affects profitability and overall economic viability within the agricultural sector.

The opportunity to implement improved road grading services within the MICC region sits under *priority one* of the Agriculture Strategy, as it would support the existing strength of the existing agricultural industry.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
1	1	1	1	1

This option has been identified as the ninth preference option resulting from the MCA process, with each of the assessed criteria scoring a value of 1 due to MICC need to collaborate with landholders to form an improved upgrades schedule.

In addition to this, the council is responsible for the allocation of road maintenance contracts which offer great potential revenue for local contractors. These local contractors should be favoured, where possible, to deliver improvement works to ensure that the potential economic benefits can be channeled back into the community. By redirecting these contracts to local businesses, not only would it stimulate the regional economy, but it could also foster a sense of ownership and accountability among residents toward the upkeep of their own infrastructure.

In essence, the state of local roads not only reflects an infrastructure deficit but also highlights systemic inefficiencies in governance and resource allocation. Addressing these challenges requires a multi-faceted approach, encompassing both policy reforms and community engagement initiatives with reliable access to funding aimed at completing maintenance works within the region. By prioritising local expertise and investment in infrastructure, positive change and benefits can be felt throughout the MICC community. In addition, it is recommended MICC review their current asset management strategy, with a particular focus on roads.

8.2.11 Aquaculture

The opportunity

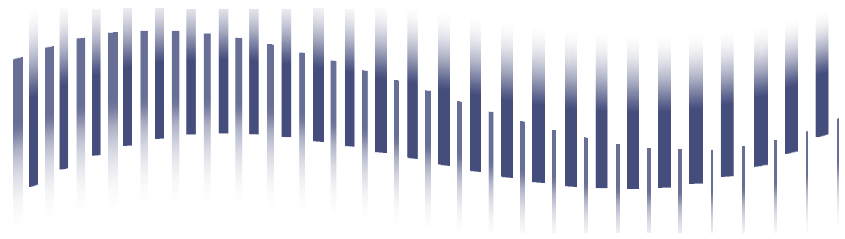
Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as feeding, regular stocking and protection from predators. Farming also implies individual or corporate ownership of the stock being cultivated¹⁰⁰. The Australian aquaculture industry occurs in marine, estuarine and freshwater locations. The industry is predominantly based in regional Australia and makes a significant and positive contribution to regional economies¹⁰¹.

Rating in detail

Environment	Yield	Economic Viability	Market Opportunities	Cultural Impact
1	1	1	1	1

¹⁰⁰ NSW Department of Primary Industries, 2024. *About aquaculture*. Accessed at: <https://www.dpi.nsw.gov.au/fishing/aquaculture/about-aquaculture>

¹⁰¹ Ibid



Aquaculture received a moderate score across all categories driven by its relatively advanced approach to farming, which allows for greater mitigation of environmental risks, when compared to traditional cropping.

Aquaculture projects are most efficient when environmental controls are implemented to ensure that the stock are under ideal conditions for breeding and growth. It is desirable to use more passive control systems such as shading as compared to active environmental controls like air conditioning, as active environmental controls will increase the cost of operations through energy usage and higher capital investment requirements. While environmental conditions in Mount Isa can be difficult, primarily due to extreme heat, the ability to control these environmental conditions through active or passive means is a significant advantage to aquaculture over many other cropping opportunities. Environmental risks can also be addressed in species selection by choosing to stock animals that are native to Mount Isa, and therefore adapted to the conditions (e.g. Redclaw).

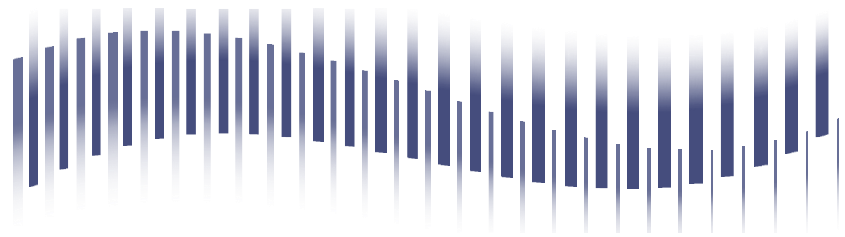
Assuming that the aquaculture system is operated by skilled proprietors who have experience in the industry, a high yield can be expected from minimal land use requirements. The yield, and economic viability of the operations have scored moderately well as a result, however it is acknowledged that aquaculture can be subject to a range of diseases or other complexities in the production cycle which can significantly impact output¹⁰². In this regard an aquaculture project, while protected by experienced operators, is not considered as resilient as some of the cropping opportunities outlined in this report, particularly when accounting for the cost and complexity of reestablishing stock.

Previous work has been commissioned by MICC to investigate the viability of an aquaculture development in Mount Isa. It is recommended that the report *Integrated Aquaculture: Mount Isa Pathway to Development 2024* is referenced for a contemporary, detailed account of establishing aquaculture production in the region. The report provides a preliminary assessment of proposed markets that may be accessible after production in Mount Isa. While the report has highlighted some promise with respect to domestic market access, it is recommended that further detailed analysis on market opportunities is conducted.

Production Information

Aquaculture production in Queensland is, from a value standpoint, centred on two key species; prawns with a gross annual production value of \$212.9m and barramundi with a gross annual production value of \$36.4m in 2022-23. With respect to preliminary work commissioned by MICC in the report *Integrated Aquaculture: Mount Isa Pathway to Development 2024*, information is provided below on the species that were assessed as most preferable for production in the Mount Isa region.

¹⁰² Sector Network Natural Resources and Rural Development Asia, 2023. *Fish Diseases in Aquaculture*. Accessed at: <https://snrd-asia.org/wp-content/uploads/2023/07/1.-Fish-Diseases.pdf>



Jade perch¹⁰³

Jade perch is the marketing name for the Barcoo grunter (*Scortum barcoo*) which is a fish native to Lake Eyre and Bulloo-Bancannia catchments. Farmers have found them to be very hardy and are optimistic about their potential. The species are attractive in colour and have a high weight-to-length ratio. Jade perch producers usually target sales to the live fish markets in Brisbane, Sydney and Melbourne. Jade perch are omnivores that feed on:

- Zooplankton and algae
- Small crustaceans
- Aquatic insects
- Molluscs.



Figure 28: Jade perch

Jade perch is farmed in Queensland in either tanks or ponds. To successfully farm jade perch, careful management of stocking rates, water quality and diet is required. Industry evidence suggests that production up to 5-10t per hectare in well-managed ponds is possible.

Water temperature and pH levels are key to maximum growth and survival for commercial production, including:

- Dissolved oxygen (DO) levels of 4mg per litre or greater
- Aeration (paddlewheels and/or aspirators)
- Increased aeration and water exchanges when pond water temperatures exceed 30°C.

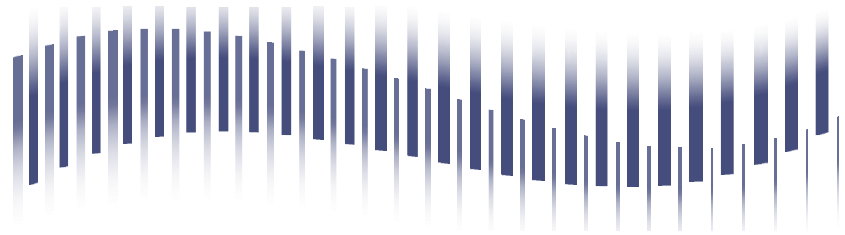
Lower temperatures can seriously affect jade perch if the water temperature is at or below:

- 20°C, which leads to rapid decline in growth rates
- 17°C, which leads to fish death during handling
- 16°C, which causes farmers to stop feeding
- 13°C, which mass deaths can occur.

Jade perch can tolerate a pH of between 6 and 9, but the ideal range is 6.5 to 8.5. Salinity levels of 5g of sodium chloride per litre of water are acceptable for long-term exposure and can be used to treat ectoparasite and fungal diseases.

Industry experience suggests that stocking rates in ponds should be up to a maximum of 15,000 fish per ha, although no systematic research has been undertaken on husbandry practices. In tanks, the stocking density depends on the capacity of the system but appears to be at least comparable with those used for barramundi.

¹⁰³ Business Queensland, 2024. *Jade perch aquaculture*. Accessed at: <https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/aquaculture/species/jade-perch>



Redclaw¹⁰⁴

The redclaw (*Cherax quadricarinatus*) is a species of freshwater crayfish native to tropical Queensland and the Northern Territory and are commonly found in the wild in the Mount Isa region. Redclaw crayfish have biological characteristics that give them an advantage in aquaculture such as fast growth, the ability to breed naturally in ponds and a simple lifecycle. In Queensland, the industry is well developed and redclaw are relatively economical to produce due to simple production systems and natural breeding. Queensland redclaw crayfish are recognised both domestically and internationally as a safe and healthy product.



Figure 29: Redclaw

Feeding is normally undertaken three times a week just before dusk to coincide with the animal's peak foraging behaviour. Some form of aeration is normally installed to increase the carrying capacity of the ponds. Feeding of formulated pellets is often supplemented by a mixture of grains to provide a basic food base for the animal, although much of the nutritional requirements can be obtained from natural pond production (e.g., plankton, bacteria, protozoans). This natural production can be enhanced by organic and inorganic fertilisation, as long as ammonia (<0.05mg/L) and oxygen levels (>5.0mg/L) remain within the acceptable range.

Ponds range in size from 1,000 to 1,200 square metres (m²) with sloping bottoms (1.3-1.8m deep) for easier drain harvesting. Juvenile crayfish of similar size are stocked in prepared ponds at 5-15 animals per m². Stock and pond water must be carefully managed to maximise growth and animal health. This includes:

- An ideal site of water temperatures above 23°C during as much of the year as possible
- Optimal growth which takes place between 26°C and 29°C
- Deaths occur in cold and hot extremes of 9-10°C and 34-35°C.

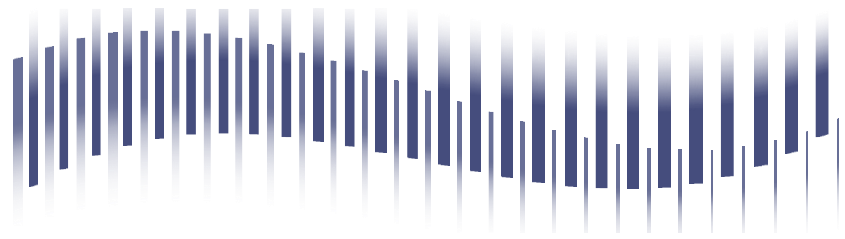
Redclaw can survive under conditions that would normally kill other species, but their pond water still must be carefully managed. Redclaw tolerate very low oxygen levels, but the dissolved oxygen level should be kept above five parts per million. If dissolved oxygen in the pond water drops below one part per million, redclaw move to the edge of the pond where oxygen levels are higher. Extremely low oxygen will cause crayfish to migrate from the pond over land. Salinity levels in pond water that regularly exceed two parts per thousand will impact growth and behaviour.

The ideal pH range for redclaw is 7-8.5. Moulting and hardening of the redclaw's shell can occur if:

- the pH level of the water is less than 7
- calcium levels are low, with a hardness of less than 50 parts per million.

The total grow out time in earthen ponds is 6-9 months (plus the 3-4 months spent in the juvenile production pond). Stock is often harvested progressively due to differential growth rates. Several market size grades exist from 35g to over 100g.

¹⁰⁴ Business Queensland, 2024. *Redclaw crayfish aquaculture*. Accessed at: <https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/aquaculture/species/redclaw-crayfish>



Economic information

In 2021-22 the production value of Australia's fisheries and aquaculture sector was up 8% to a total value of \$3.42b. This result reinforces the increasing trend over the last two decades that has resulted in incrementally higher value and volume of production from the aquaculture sector. This increase in production value is largely attributed to a higher price for Salmonids in the export market. Higher production in aquaculture across finfish, crustaceans and molluscs were effective in offsetting the decline in wild-catch fisheries¹⁰⁵. Australian consumption of seafood is estimated at 350,000 tonnes annually, of which 65% is imported¹⁰⁶. This is suggestive of a possible gap in the market for increased domestic production, assuming it can be cost competitive with imported products.

In Queensland, the three key species for aquaculture and wild-catch production are prawns, barramundi and crabs (with crabs generally being a wild-catch only operation). Preliminary figures from 2021-22 show an increase in production for the aquaculture sector from 11,825 tonnes and \$187m to 13,023 tonnes and \$219m¹⁰⁷. In 2021-22, aquaculture employed the full-time equivalent of 889 Queenslanders, up from 786 the previous financial year¹⁰⁸.

In March 2023 the Queensland Government announced a funding package of \$7.5m to expand investment in aquaculture. The funding includes:

- \$3.8 million for research, development and extension activities
- \$1.5 million for industry development
- \$1.1 million program to improve regulation and technical guidance
- \$1 million to establish an aquaculture incubator.

This funding indicates that the Queensland Government views aquaculture as a priority area for expansion. Funding which has been dedicated to research and development activities will have a state-wide benefit to a prospective aquaculture operator, as the overall skill uplift is likely to result in increased productivity for the industry.

8.3 Summary

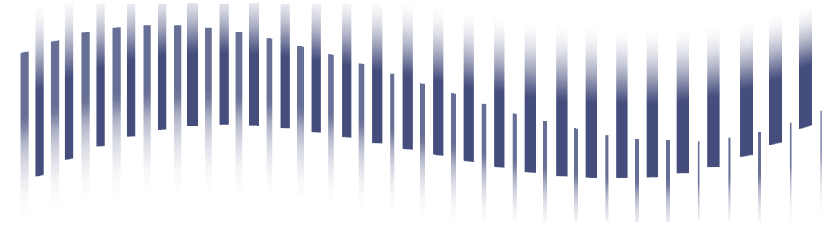
This section has outlined the top 11 prospective opportunities, and their link to the Agriculture Strategy. This detailed economic and production analysis (where relevant) should inform MICC's decision to progress specific options for investment either through government or private funding sources depending on the commercial nature of the opportunity.

¹⁰⁵ Department of Agriculture and Fisheries, 2022. *Australian fisheries and aquaculture statistics 2022*. Accessed at: https://daff.ent.sirsidynix.net.au/client/en_AU/search/asset/1035343/0

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ Minister for Agricultural Industry Development and Fisheries and Minister for Rural Communities, Media release March 2023. *Palaszczuk Government injects \$7.5 million into booming aquaculture industry*. Accessed at: <https://statements.qld.gov.au/statements/97320>



9 Implementation Plan

9.1 Purpose

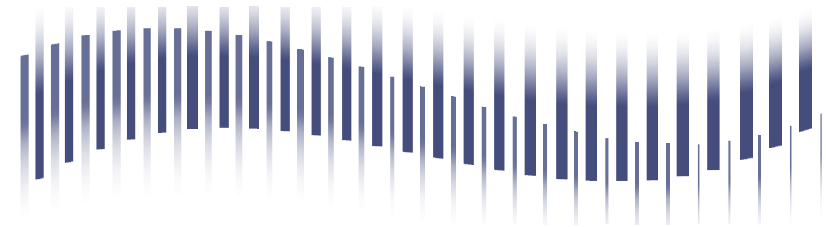
This implementation plan acts as a roadmap for executing projects under the Agriculture Strategy. Its primary purpose is to outline next steps, expected resources, timelines and responsible parties to allow MICC to reach its strategic objectives. The actions outlined in this implementation plan will also provide MICC with preliminary milestones to measure progress and hold relevant stakeholders accountable to project development. Where appropriate, the implementation plan outlines potential partnerships that may lead to an effective delivery model for the relevant project. The implementation plan should not be considered an exhaustive list of project management tasks, as further investigative work may be required on a project-by-project basis. Not all actions are sequential, and many of them can be undertaken in parallel as part of concurrent scopes of work to achieve the most efficient outcome.

9.2 Project lifecycle

Figure 28 shows the project lifecycle stages that have been used to provide an indication of where each top 11 opportunity sits in terms of its development to a fully realised commercial opportunity. Due to the transformative nature of the projects suggested under the Agriculture Strategy, and in many instances the marked departure from Mount Isa's current and typical agricultural activity, many projects are in the early phases of development. These projects are expected to require further detailed feasibility work, ideally with the collaboration of a prospective investor.



Figure 28: Project lifecycle

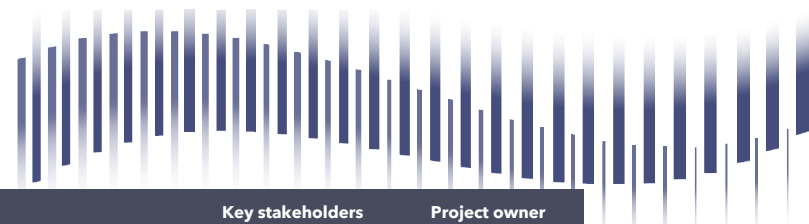


9.3 Implementation Plan

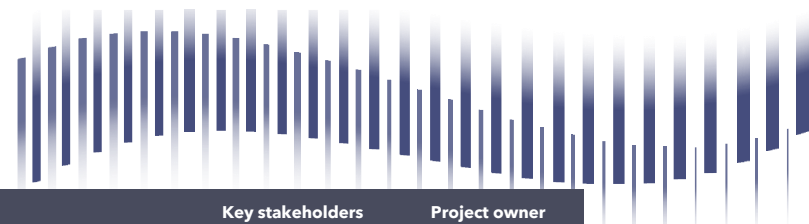
Table 15 outlines the Agriculture Strategy Implementation Plan, which outlines each prospective opportunities’ immediate actions, position in the project lifecycle, partners and stakeholders as well as the proposed project owner.

Table 15: Implementation plan, actions and stakeholders

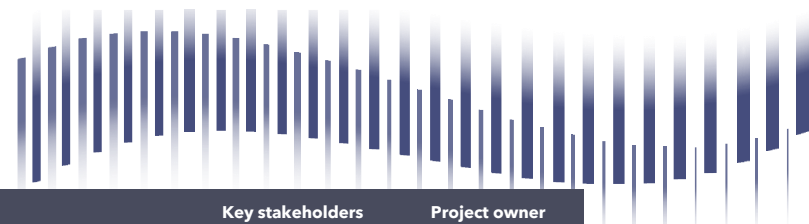
Project	Project lifecycle	Actions	Key stakeholders	Project owner
Irrigated forage crops	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: MICC to appoint an internal project manager with expertise in agricultural projects to oversee project planning and coordination of preliminary activities. This position is not to be a dedicated Full Time Equivalent, however may be resourced from within internal Council resources. Action 2: MICC to identify a willing proponent with suitable industry expertise to successfully manage a cropping project of this nature. This process may be a targeted identification through existing relationships, or an open Expression of Interest (EOI) process. Action 3: MICC to ensure that permits and other regulatory matters have been cleared in advance to assist in smooth project development once a proponent has been identified. This may require collaboration with the State Government. Action 4: MICC to introduce a relationship between a prospective forage crop operator and local graziers as well as large grazing operations across the Northwest (listed as key stakeholders). 	<ul style="list-style-type: none"> MICC AACo Stanbroke NAPCo Local graziers Private proponents Southern Gulf NRM 	<ul style="list-style-type: none"> MICC
Abattoir - Game Meat	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: MICC to conduct formal consultation with Russell Peters as the previous operator of a game abattoir in the Mount Isa region. This consultation should identify, and seek to mitigate, any challenges that were identified in the operation of the facility (e.g., water quality). Action 2: MICC to undertake a comprehensive assessment of existing infrastructure that has previously supported a small-scale game abattoir in 	<ul style="list-style-type: none"> MICC Private proponents 	<ul style="list-style-type: none"> MICC



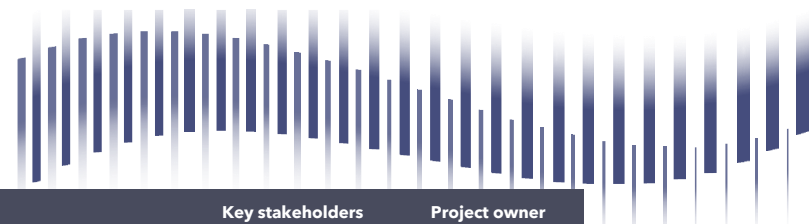
Project	Project lifecycle	Actions	Key stakeholders	Project owner
		the region. In conjunction with Action 1, MICC should identify if this infrastructure remains fit for purpose, or has scope for expansion.		
Supplementary Cattle Feeding & On-farm / Mini feedlots	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: MICC to appoint an internal project manager with expertise in the grazing industry to oversee project planning and coordination of preliminary activities. This position is not to be a dedicated Full Time Equivalent, however may be resourced from within internal Council resources. Action 2: MICC to conduct detailed feasibility on the implementation of additional feedlot infrastructure in the region, with a view towards providing flexibility to local operators with respect to market access for their product. This study should evaluate whether existing infrastructure in the region (privately owned) is fit for purpose or demonstrates merit for expansion. It may also consider the economic viability of publicly owned infrastructure. 	<ul style="list-style-type: none"> MICC AACo Stanbroke NAPCo Local graziers Private proponents Southern Gulf NRM 	<ul style="list-style-type: none"> MICC
Bush Hay	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: MICC to appoint an internal project manager with expertise in agricultural projects to oversee project planning and coordination of preliminary activities. This position is not to be a dedicated Full Time Equivalent, however may be resourced from within internal Council resources. Action 2: MICC to identify a willing proponent with suitable industry expertise to successfully manage a cropping project of this nature. This process may be a targeted identification through existing relationships, or an open EOI process. Action 3: MICC to ensure that permits and other regulatory matters have been cleared in advance to assist in smooth project development once a proponent has been identified. This may require collaboration with the State Government. Action 4: MICC to introduce a relationship between a prospective forage crop operator and local graziers as well as large grazing operations across the Northwest (listed as key stakeholders). 	<ul style="list-style-type: none"> MICC AACo Stanbroke NAPCo Local graziers Private proponents Southern Gulf NRM 	<ul style="list-style-type: none"> MICC



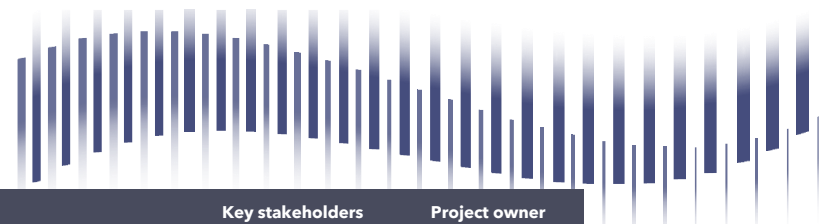
Project	Project lifecycle	Actions	Key stakeholders	Project owner
		<ul style="list-style-type: none"> • Action 5: MICC to ensure that Bush Hay project is connected to the irrigated forage support crop project as there are natural synergies between these two opportunities explained throughout this report. 		
Date Palms	Demand analysis / market sounding	<ul style="list-style-type: none"> • Action 1: MICC to appoint an internal project manager with expertise in agricultural projects to oversee project planning and coordination of preliminary activities. This position is not to be a dedicate Full Time Equivalent, however may be resourced from within internal Council resources. • Action 2: MICC to identify a willing proponent with suitable industry expertise to successful manage a cropping project of this nature. This process may be a targeted identification through existing relationships, or an open EOI process. • Action 3: MICC to ensure that permits and other regulatory matters have been cleared in advance to assist in smooth project development once a proponent has been identified. This may require collaboration with the State Government. 	<ul style="list-style-type: none"> • MICC • Private proponents 	<ul style="list-style-type: none"> • MICC
Citrus	Demand analysis / market sounding	<ul style="list-style-type: none"> • Action 1: MICC to appoint an internal project manager with expertise in agricultural projects to oversee project planning and coordination of preliminary activities. This position is not to be a dedicate Full Time Equivalent, however may be resourced from within internal Council resources. • Action 2: MICC to identify a willing proponent with suitable industry expertise to successful manage a cropping project of this nature. This process may be a targeted identification through existing relationships, or an open EOI process. • Action 3: MICC to ensure that permits and other regulatory matters have been cleared in advance to assist in smooth project development once a proponent has been identified. This may require collaboration with the State Government. 	<ul style="list-style-type: none"> • MICC • Private proponents 	<ul style="list-style-type: none"> • MICC



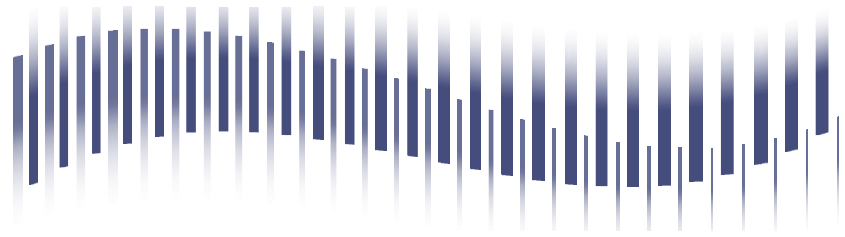
Project	Project lifecycle	Actions	Key stakeholders	Project owner
Increased Stocking Rates	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: MICC to engage with Southern Gulf NRM to capture projects which have previously been progressed in the region. Action 2: Southern Gulf NRM and MICC to assist landholders with advocacy to the State Government, through DSDI, to access funding for project works and on-farm improvements. 	<ul style="list-style-type: none"> MICC AACo Stanbroke NAPCo Local graziers Private proponents Southern Gulf NRM DSDI 	<ul style="list-style-type: none"> MICC Southern Gulf NRM
School Based Apprenticeships, Business Development Opportunities and Educational Opportunities	Demand analysis / market sounding	<p>School Based Apprenticeships</p> <ul style="list-style-type: none"> Action 1: MICC to appoint an internal project manager with relevant industry expertise and connections to oversee project planning and coordination of preliminary activities. This position is not to be a dedicate Full Time Equivalent, however may be resourced from within internal Council resources. Action 2: MICC to engage with TAFE Queensland and secondary schools in the Mount Isa region to establish a collaborative approach to expanding school-based apprenticeship opportunities for the local agriculture industry. Action 3: MICC to engage members of the local agriculture industry, starting with major operations (listed as key stakeholders) to establish a pathway for students interested in the agriculture sector. <p>Business Development and Educational Opportunities</p> <ul style="list-style-type: none"> Action 1: MICC to conduct market sounding with local agriculture industry to determine topics of interest for guest speakers at industry events. Recommendations based on preliminary work would include water regulation, transport and logistics providers and land tenure issues. 	<ul style="list-style-type: none"> MICC AACo Stanbroke NAPCo Local graziers / landholders TAFE Queensland Mount Isa schools MITEZ CRCNA State Government Agencies (e.g., DAF, DRDMW) Relevant guest speakers from industry 	<ul style="list-style-type: none"> MICC



Project	Project lifecycle	Actions	Key stakeholders	Project owner
Road Grading	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: MICC to appoint an internal lead to review road asset management strategies, including awarding of maintenance and grading contracts. This position is not to be a dedicate Full Time Equivalent, however may be resourced from within internal Council resources. Review should target an appropriate weighting for local delivery of works, and agility to respond to emergent works, particularly in the event of natural disasters (e.g., floods). Action 2: MICC to engage with State Government to investigation option for State-controlled road grading assistance. 	<ul style="list-style-type: none"> MICC DTMR Local landholders 	<ul style="list-style-type: none"> MICC
Spinifex Grass	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: MICC to engage with Myuma PTY LTD to gain a further understanding of trials currently underway in partnership with the University of Queensland. Action 2: MICC to appoint an internal lead to work with Myuma, University of Queensland, and relevant government stakeholders to ensure that barriers to operation for the spinifex grass production project are removed. Action 3: MICC to engage with Southern Gulf NRM regarding environmental impacts of spinifex harvesting to ensure a comprehensive ecological assessment of the opportunity is completed. 	<ul style="list-style-type: none"> MICC Myuma PTY LTD University of Queensland Colin Saltmere Southern Gulf NRM 	<ul style="list-style-type: none"> Myuma PTY LTD
Aquaculture	Business Case	<ul style="list-style-type: none"> Action 1: MICC to conduct any additional analysis required on figures provided in the <i>Integrated Aquaculture: Mount Isa Pathway to Development 2024</i> report by Stuart Chignell to determine if this opportunity is ready to progress towards seeking investment Action 2: MICC to engage private proponents with the requisite skills to operate an aquaculture project in the region. 	<ul style="list-style-type: none"> MICC Stuart Chignell Southern Gulf NRM Private proponents 	<ul style="list-style-type: none"> MICC



Project	Project lifecycle	Actions	Key stakeholders	Project owner
Advancing Agriculture in Mount Isa	All	<p><i>These actions are specifically targeted towards Council's control and influence in advancing the agriculture industry in Mount Isa.</i></p> <ul style="list-style-type: none"> • Set up an 'Advancing Agriculture' committee within MICC. This committee should engage in monthly correspondence with neighbouring LGAs to identify opportunities for collaboration with agricultural projects in different areas, understanding how Mount Isa can support and act as a commercial hub for these opportunities. • Develop a disaster resilience strategy for primary producers given uncertainty of both climatic conditions in the region, and the response of insurance agencies to these events. • Investigate facilitation of a farmer-owned or controlled association (e.g., NT Farmers). • Continue advocacy with the State Government (DSDI, DAF, DRDMW, DESI and others). • Commence consultation with Camooweal / Georgina Basin landholders to identify prospective sites for project development. 	<ul style="list-style-type: none"> • MICC 	<ul style="list-style-type: none"> • MICC

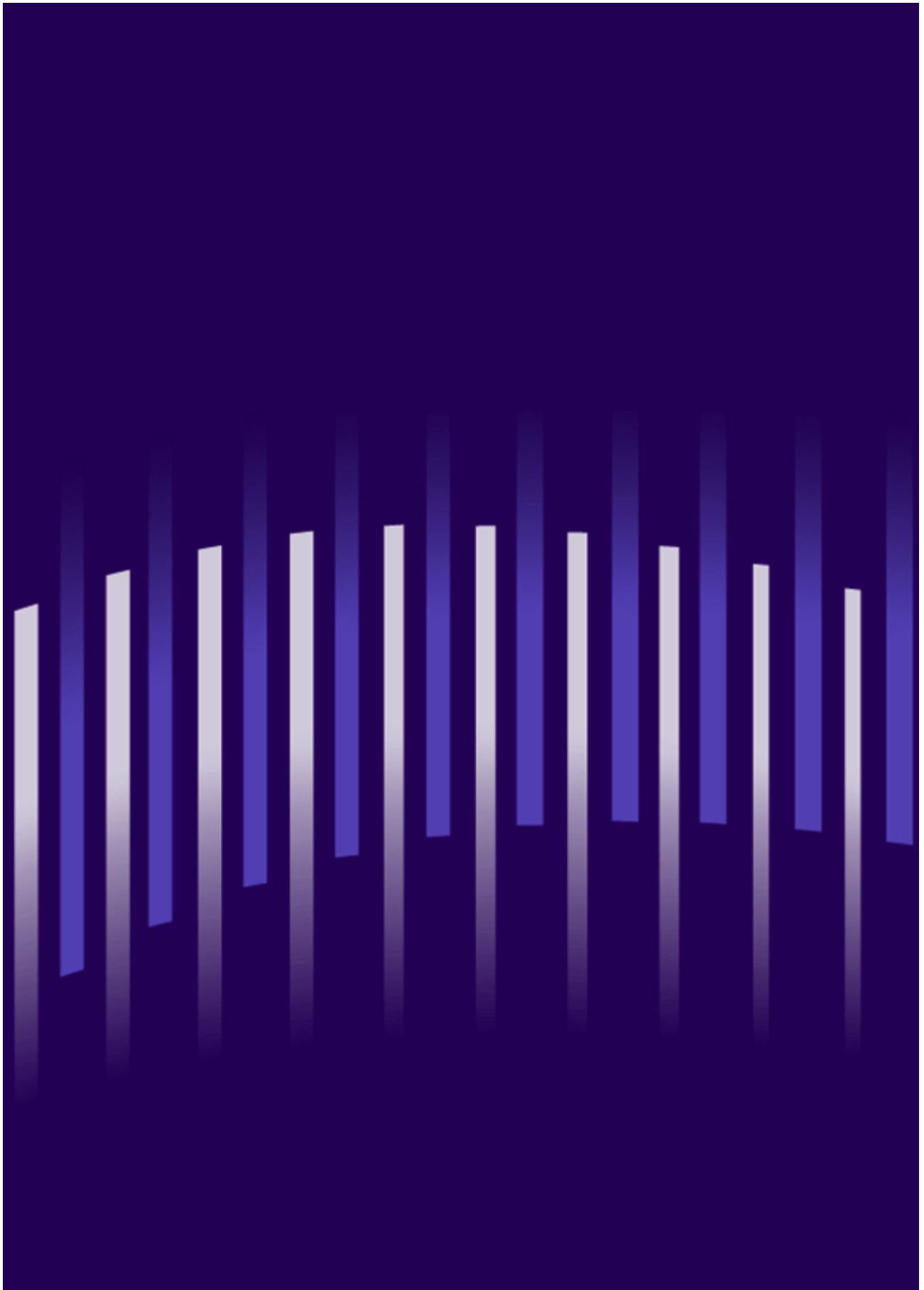


10 Conclusion

Mount Isa faces a critical threat to its economy through the potential job loss from Glencore's partial shutdown of mining operations. It is imperative that MICC as well as other Government and industry stakeholders contribute to the effort of advocating for Mount Isa and securing the city's economic future. Each category of stakeholder has a role to play in protecting Mount Isa's economy, from investment to policy reform, advocacy, and innovation.

Mount Isa has a strong agriculture sector, currently focused predominantly on the grazing industry. As the city looks to diversify its economy away from a heavy reliance on the resources sector, the agriculture sector represents not only a potential economic contributor, but a change to the culture of the region. Desktop analysis and stakeholder consultation have identified some concerns with an expansion into cropping activities in the Mount Isa region, however this report has outlined a number of opportunities which show promise despite tough climatic conditions. Both in Queensland, and Australia more broadly, there is a significant amount of cropping expertise which can be leveraged in Mount Isa. This report has attempted to capture the strengths and weaknesses of proposed opportunities, so that where possible they can be assessed dynamically as barriers to implementation are overcome.

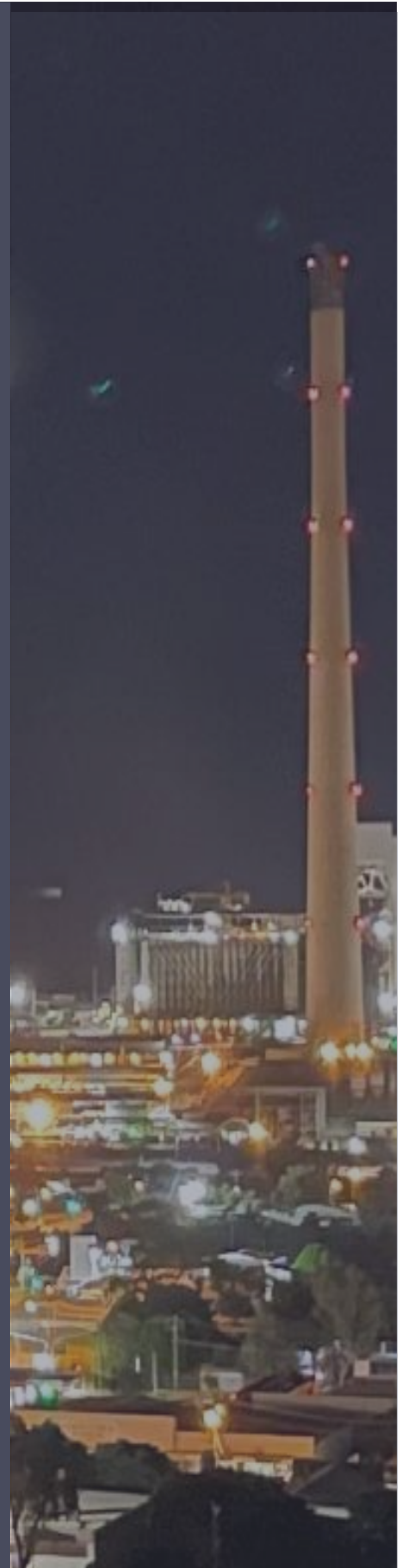
MICC has developed a comprehensive strategy to respond to the economic threat facing the region, and there is buy in from many stakeholders in addressing this situation. The agriculture pillar of Mount Isa's economic transformation strategy is only one pillar in the overall response, and it should work in conjunction with priority opportunities assessed across all pillars.





Transformation of Economy Strategy Critical Infrastructure

May 2024



Disclaimer

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We make no representation concerning the appropriateness of this report for anyone other than Mount Isa City Council. If anyone other than Mount Isa City Council chooses to use or rely on it they do so at their own risk.

This disclaimer applies:

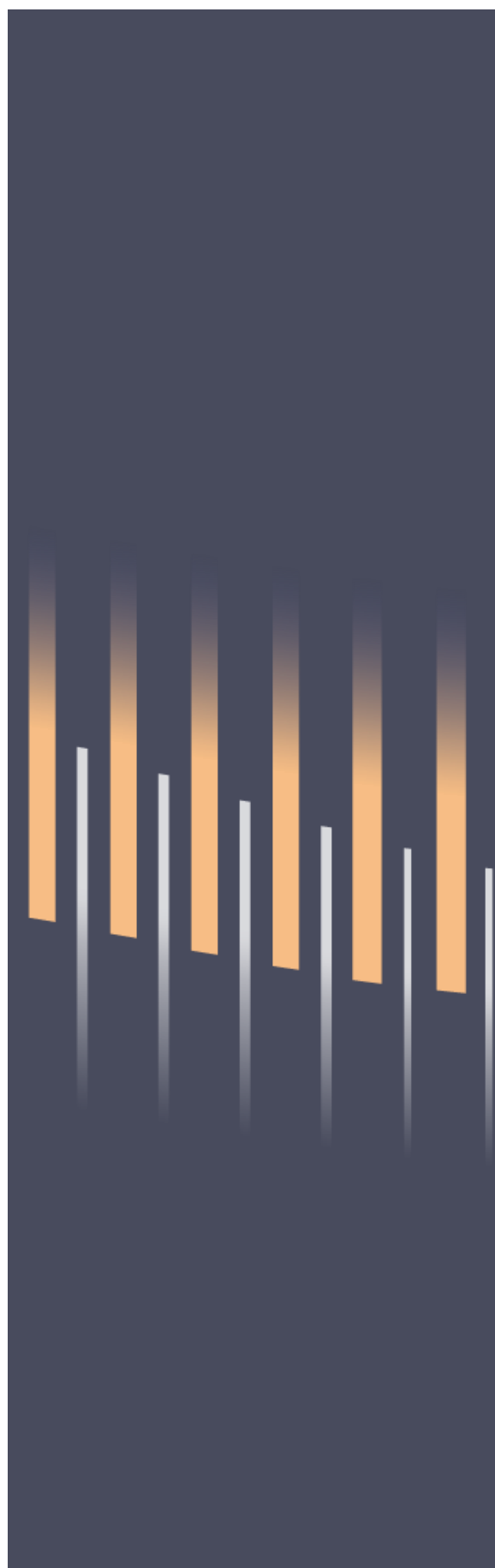
- to the maximum extent permitted by law and, without limitation, to liability arising in negligence or under statute; and
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Contents

1. Introduction	3
1.1 Context	3
1.2 Purpose	7
1.3 Approach	7
2. Foundations of the Strategy	9
2.1 Council's vision for the region	9
2.2 Role of Council	10
2.3 Industry development pillars	10
2.4 Critical Infrastructure pillar	11
2.5 Summary	19
3. Project identification and assessment	20
3.1 Approach	20
3.2 Longlist	21
3.3 Rationalisation	29
3.4 Multi-criteria assessment	33
3.5 Shortlist	45
4. Shortlisted Projects - Pathways to delivery	47
4.1 Rail access regulatory change / subsidies	47
4.2 North West Queensland Correctional Precinct	50
4.3 CopperString 2032 (Northwest and Southern Spurs)	53
4.4 Residential rehabilitation centre	56
4.5 Tyre recycling facility	60
4.6 Public aged care capacity for high and complex care needs	62
4.7 Mount Isa Rail Line upgrades	65
4.8 Mount Isa Transport and Logistics Centre (TLC)	67
4.9 Domestic and family violence accommodation	71
5. Implementation Plan	75
5.1 Purpose	75
5.2 Implementation Plan	75

Transformation of Economy Strategy





1. Introduction

Scyne Advisory has been engaged by Mount Isa City Council (MICC or Council) to develop the Critical Infrastructure Transformation of Economy Strategy (the Strategy or Critical Infrastructure Strategy) for Mount Isa. The Strategy forms part of a broader economic reform agenda that is progressing in response to Glencore’s announcement in October 2023 that it would close all copper mining operations in Mount Isa by 2025. This chapter presents the approach to the Strategy’s development and includes:

- Context
- Purpose
- Approach.

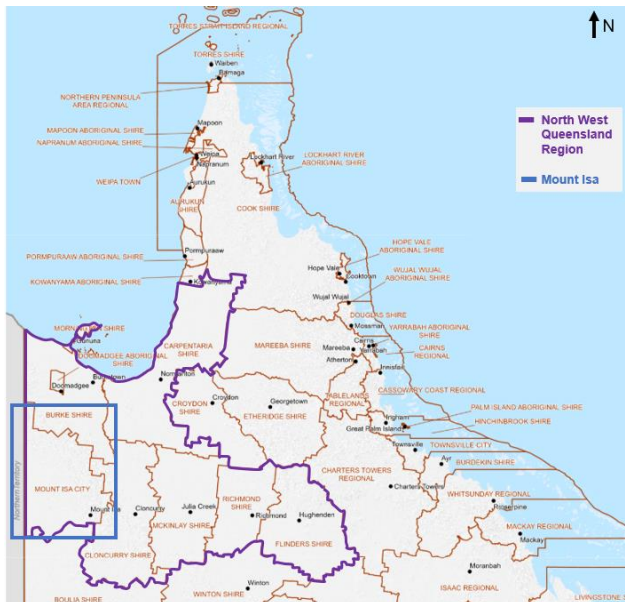
1.1 Context

The context for the Critical Infrastructure Strategy is provided through an overview of Mount Isa’s location, regional economic indicators and a background on Mount Isa Mines.

1.1.1 Location

Mount Isa is situated in North West Queensland which covers an approximate area of 307,000 square kilometres (Figure 1). The region includes nine local government areas:

- Burke Shire
- Carpentaria Shire
- Cloncurry Shire
- Doomadgee Shire
- Flinders Shire
- McKinlay Shire
- Mornington Shire
- Mount Isa Cite
- Richmond Shire



Transformation of Economy Strategy



Figure 1: North West Queensland boundary map

The Mount Isa Local Government Area shares a boundary with the Northern Territory to the west and includes the township of Camooweal, located 191 kilometres to the north-west. Mount Isa city is on the traditional lands of the Kalkadoon people, who followed patterns of hunting and gathering, fishing and trade for many thousands of years before the arrival of the first Europeans.¹ In addition to the Kalkadoon people, the Indjalandji-Dhidhanu people hold their traditional Country of the upper Georgina River Basin, a vast area of red and black soil country extending across the Queensland-Northern Territory border around Camooweal. Indjalandji-Dhidhanu Country encompasses the grassland plains and limestone caves of the Barkly Tablelands and is drained by freshwater systems flowing south to Lake Eyre.² Part of North West Queensland including Mount Isa falls within Gulf Country, a lowland region of woodland and savanna grassland surrounding the Gulf of Carpentaria in north western Queensland and eastern Northern Territory. The region also encompasses the North West Minerals Province, one of the world's most significant base and precious metals producers.

1.1.2 Economic indicators

Owing to the region's abundant natural resources, environment and climate, the major industry in North West Queensland is mining and minerals processing. From an SA3 perspective, the Townsville-North West Region's gross regional product (GRP) for Financial Year (FY) 23 was \$36.3 billion, with approximately 23% (\$8.4 billion) generated by the Mount Isa Local Government Area (LGA).

In Mount Isa, mining is the most productive industry, generating \$7.1 billion of value add³ in FY23, accounting for 88% of total value add across all industries and 36.5% of employment. Value added for each industry section in FY23 is presented in Table 1, with the largest contributors bolded. Industry value added contributes to GRP. However, GRP includes all economic activities not just industry specific measures, therefore there is a small discrepancy between Mount Isa's GRP and total industry value add reported in Table 1.

Table 1: Value added by industry sector in Mount Isa (FY23)

Industry	\$ millions
Agriculture, Forestry and Fishing	41.1
Mining	7,120.5
Manufacturing	55.1
Electricity, Gas, Water and Waste Services	44.8
Construction	293.4
Wholesale Trade	48.8
Retail Trade	38.6
Accommodation and Food Services	31.4
Transport, Postal and Warehousing	41.8
Information Media and Telecommunications	4.4
Financial and Insurance Services	20.6
Rental, Hiring and Real Estate Services	24.4
Professional, Scientific and Technical Services	20.7

¹ MICC. Welcome to Mount Isa. <https://www.mountisa.qld.gov.au/city-and-council/welcome-to-mount-isa#:~:text=Mount%20Isa%20is%20situated%20on,quality%20of%20their%20stone%20implements.>

² Queensland Government - Camooweal - <https://www.qld.gov.au/environment/plants-animals/conservation/community/land-sea-rangers/locations/camooweal>

³ Value added by industry shows how productive each sector is at increasing the value of its inputs. It is a more refined measure of the productivity of an industry sector than output (total gross revenue), as some industries have high levels of output but require large amounts of input expenditure to achieve that.



Administrative and Support Services	41.6
Public Administration and Safety	70.6
Education and Training	53.4
Health Care and Social Assistance	113.0
Arts and Recreation Services	3.2
Other Services	30.9
Total value added	8,098.2

The majority of mining value added is generated by metal ore mining (82%), with exploration and other mining services, and coal mining the next largest sub-industries contributing 3.5% and 2.4% respectively. However, value added by both of these sub-industries increased in the five years between FY19 and FY23, whereas value added from metal ore mining decreased by a considerable \$3.1 billion.⁴ This is likely attributed to the reduction in quality of ore, acknowledged by Glencore as the reason for ceasing operations in 2025.

Figure 2 presents the change in value added by industry sectors in Mount Isa in the five years between FY19 and FY23. While some industries are growing their value add, including construction (up \$249 million), agriculture (up \$14 million) and health care and social services (up \$12 million), these sectors contribute far less to Mount Isa's economy presenting a clear picture of the magnitude of the problem of the closure of Glencore's copper mining operations.

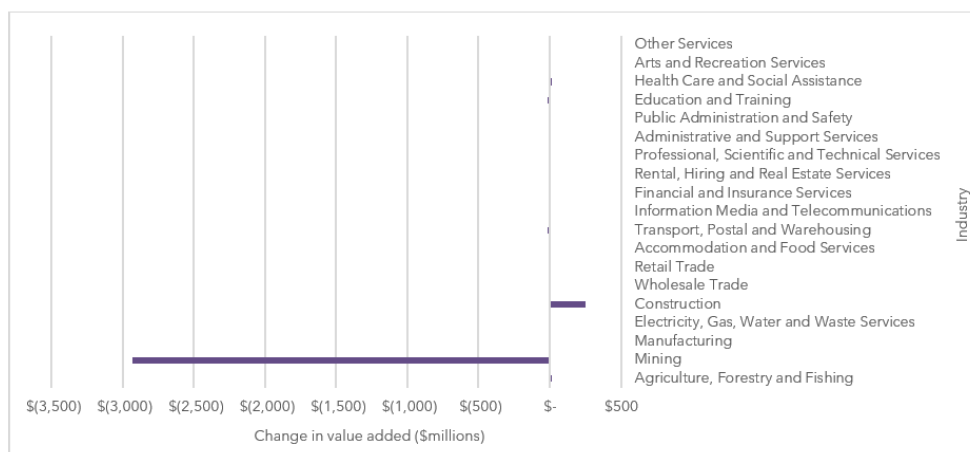


Figure 2: Change in value added by industry sector, FY19 to FY23

Figure 3 presents this information as a percent change in value add, demonstrating the massive growth in the construction industry and the significant decrease in metal ore mining and transport, the latter of which is likely directly related to a reduction in mining activity.

⁴ Economy ID. (2023) RDA Townsville North West Region economic profile. <https://economy.id.com.au/rdanwq>

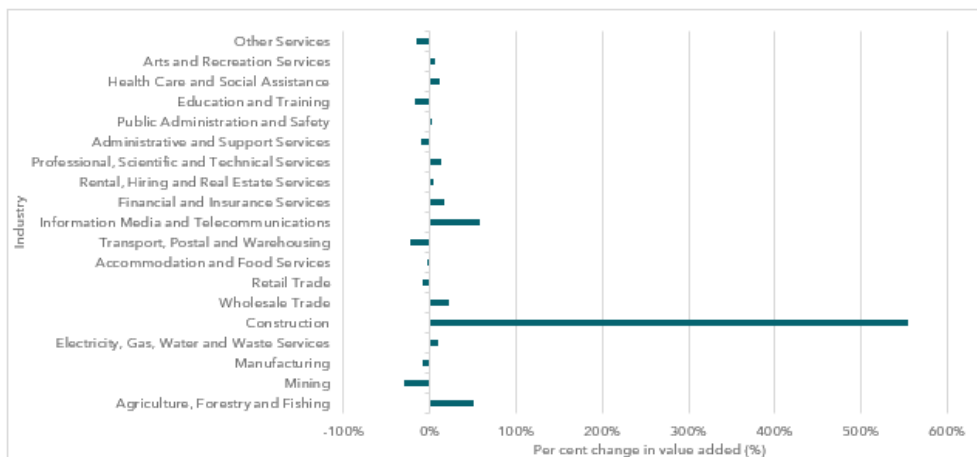


Figure 3: Per cent change in value added by industry sector, FY19 to FY23

The key industries⁵ that are generating the most economic activity where value add is growing are:⁶

- **Construction:** Closely associated to the industrial nature of the mining industry in the region, construction and more specifically heavy and civil engineering construction is a key employer accounting for 10.5% of Mount Isa’s workforce. This industry has grown fivefold since FY19 and is the second largest contributor to Mount Isa’s economy. However, construction generated \$293 million for Mount Isa FY23, or only 3.6% of total value add.
- **Health care and social services:** As a service hub for the Northwest, health care and social services is the next largest industry, contributing 1.4% or \$113 million to Mount Isa’s economy in FY23, and employing 11.1% of Mount Isa’s workforce.
- **Agriculture:** While the agriculture industry’s value add has shown strong growth in the five years from FY19 (increase of 51%) it only contributed 0.5% or \$41 million to the Mount Isa economy in FY23 and employed 1% of the workforce.
- It is positive that these industries are increasing their value add and contributing to economic diversification. Nevertheless, the economic indicators clearly demonstrate the significance of the mining sector in Mount Isa and that the local economy heavily relies on decreasing levels of mining activity.

1.1.3 Mount Isa Mines

Mount Isa Mines was founded in 1924 and has been operated by Glencore since 2013. The mines are the hub of Glencore’s copper and zinc operations in Queensland, and it is one of the world’s largest mining complexes. In October 2023, Glencore announced that it will cease all copper mining operations in Mount Isa by 2025 due to low-quality ore. At least 1,200 direct jobs will be lost as a result of the mine closure. Without intervention, it is estimated that a further 3,600 jobs could be lost which has the potential to result in a significant decline in Mount Isa’s population of 18,727 as per the 2021 census.⁷ The closure of Mount Isa Mines calls into question the future of the community which was established around the mining supply chain and relies on the associated economic activity.

The Queensland Government requires any mining operator to rehabilitate land that is disturbed by mining to a safe, non-polluting condition, able to sustain an alternative land use post closure. The rehabilitation work of Glencore will be closely managed by the Queensland Government and protections exist to ensure that the local community can use the land and surrounding areas safely in the future.

⁵ Note strong growth in value add in the IT industry, however, this sector only contributed \$4 million to Mount Isa’s economy in FY23.

⁶ Economy ID. (2023) RDA Townsville North West Region economic profile. <https://economy.id.com.au/rdanwq>

⁷ ABS - 2021 Census Mount Isa LGA - <https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA35300>



Glencore has initiated the development of a Social Transition Plan to address potential issues associated with the mine closure. The purpose of this plan is to develop a prioritised list of initiatives and opportunities to support the local community, workforce and businesses through the transition and into a longer-term future. Over the short-term, Glencore intends to engage a range of community stakeholders, through one-on-one meetings, workshops and public forums to gather insights, ideas and feedback to inform the plan. Glencore’s zinc-lead operations reportedly have a strong outlook for years to come and will remain a fixture of the community and economy over the long term. Glencore is processing a range of changes to support continued operations, such as department restructures and adjustments to role accountabilities, operational and process changes to maintain safety, along with workforce reductions at different stages.

1.2 Purpose

The Department of State Development and Infrastructure (DSDI) committed a support package of up to \$50 million for mine workers and the Mount Isa community. Up to \$30 million will be allocated to accelerate development of resource projects in the North West Minerals Province over the next five years. Up to \$20 million, to be matched by Glencore, will go toward an economic structural adjustment package for Mount Isa and North West Queensland. The Mount Isa Copper Mine Closure Taskforce was established as a joint initiative between Mount Isa City Council (MICC or Council) and DSDI, which is undertaking a priority initiative to accelerate the diversification and transformation of the Mount Isa economy, focusing on six pillars; Energy, Tourism, Resources, Critical Infrastructure, Agriculture and Small and Medium Business.

As at March 2024, Glencore has not published a Social Transition Plan, however, has taken an active role in the work being completed by the Mount Isa Copper Mine Closure Taskforce, and working with consultants engaged under each of the six pillars. Through the Transformation of Economy initiative, the taskforce is strategising the overall diversification of Mount Isa’s economy and identifying pathways to realise investment. The purpose of the critical infrastructure pillar is to identify economic and social infrastructure opportunities, including collaborating and establishing partnerships to target investment, retain the population base and build economic resilience.

1.3 Approach

Taking a similar approach to Glencore, the Critical Infrastructure Strategy has been informed by comprehensive stakeholder engagement to ensure that the needs of the Mount Isa community are understood and supported, in turn allowing the prioritisation of investment and subsequent actions to be practicable and achievable to drive the desired changes. The strategy’s development has followed a robust four-step process, depicted in Figure 4.

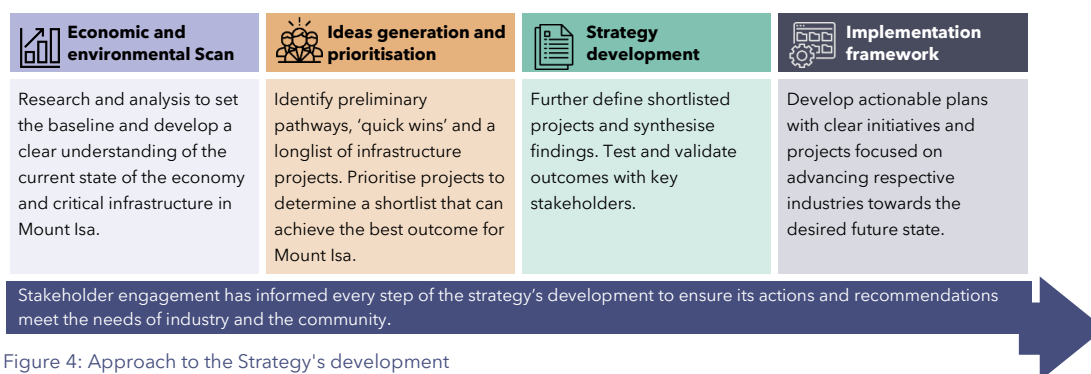


Figure 4: Approach to the Strategy’s development

1.3.1 Strategic approach to communication

The engagement approach developed for the Project was informed by the International Association for Public Participation’s (IAP2) Spectrum (Figure 5). The IAP2 Spectrum identifies the level of participation that defines the





public’s role in any engagement program. The IAP2 Spectrum has been used to determine the level and purpose of each engagement, and the most appropriate communication tools to be used.

	Inform	Consult	Involve	Collaborate	Empower
Public participation goal	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.

Figure 5: IAP2 Spectrum

The stakeholder engagement process included:

- **Identify stakeholders:** A list of stakeholders was provided by MICC and further refined by Scyne Advisory.
- **Confirm stakeholder priority with MICC:** The engagement of each stakeholder was prioritised, informed by their relevance and importance to the Critical Infrastructure pillar, the desired outcomes from the engagement, and the likelihood of an effective and informative engagement.
- **Assign appropriate method of engagement:** Each stakeholder was assigned a type of engagement, ranging from formal face-to-face consultations to informal discussions or updates via email. This was generally determined by the allocated priority.
- **Contact and engage:** The approved stakeholder engagement participants were contacted by the appropriate party and, where feasible, engaged in a timely manner in line with the prioritisation of each engagement.
- **Analysis:** The outcomes of the stakeholder engagement were used to develop an understanding of the challenges and opportunities in the region and inform the development and prioritisation of potential initiatives.

Stakeholder feedback has been instrumental in the Critical Infrastructure Strategy’s development. Those involved are presented in Table 2. Stakeholder engagement will remain an integral part of the Strategy’s implementation, and Council will continue to consult with industry and community to ensure ongoing support and that it is delivering on Council’s objectives for the region.

Table 2: Stakeholders

Stakeholders		
Mt Isa City Council	Department of Regional Development, Manufacturing and Water (DRDMW)	Transbulk Logistics
Mount Isa to Townsville Economic Zone (MITEZ)	DSDI	Laura Johnson Home
Mount Isa Airport	Aurizon	Sun Water
Queensland Police Service	Department of Transport Main Roads (TMR)	Department of Defence
Queensland Health	Queensland Rail	Martinus Rail
Queensland Corrective Services	Member for Traeger	Cooperative Research Centre for Developing Northern Australia
Mount Isa Water Board	Regional Development Australia North West Queensland (RDANWQ)	North West Phosphate



2. Foundations of the Strategy

This chapter sets out the foundations of the Strategy, including alignment to Council's strategic planning and an overview of the current state of infrastructure in the region. This chapter includes:

- Council's vision for the region
- Role of Council
- Industry development pillars
- Critical Infrastructure pillar.

2.1 Council's vision for the region

Mount Isa City Council's vision for the region is "Making our good city great, through innovation, diversification and cultural enhancement". This vision is underpinned by five themes that guide Council's planning, including:

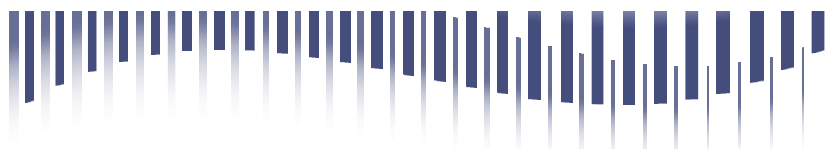
- **People & Communities:** To establish safe and healthy communities with a strong sense of identity which supports existing industry and encourages new and innovative business and practices.
- **Prosperous & Supportive Economy:** To develop a prosperous and diverse local economy which supports existing industry and encourages new and innovative business and practices.
- **Services & Infrastructure:** To establish innovative and efficient infrastructure networks that services the local communities and industries.
- **Healthy Environment:** To recognise, protect, manage and promote our unique natural environment to ensure the economic, environmental, social and cultural values are developed for long term sustainability.
- **Ethical & Inclusive Governance:** To practice inclusive and ethical governance through proactive engagement with all sectors of the community, council and all levels of government.

This vision is the foundation of the Critical Infrastructure Strategy, which at its core is seeking to diversify and enhance the region through innovation and targeted investment.

Council's Economic Development Strategy 2023-24028 (Mount Isa, Moving Ahead), is another central planning tool and key input to the Critical Infrastructure Strategy, setting a clear pathway for the region's future. It acknowledges the important role that mining will continue to play in Mount Isa's economic growth, but that a more diversified industrial base that leverages the city's comparative and competitive advantages will create sustainable development. However, there are several challenges facing the region that must be addressed to realise full economic potential, including cost and competition barriers for transport, water and energy, labour and housing shortfalls and community infrastructure constraints which are impacting the City's liveability. These challenges have been strongly emphasised during the stakeholder engagement process for the Strategy's development and are focus areas for the critical infrastructure actions and recommendations. The objectives of Mount Isa, Moving Ahead are to:

- Retain and grow the City's population
- Encourage business retention and expansion
- Attract investment (both people and industry)
- Support industry diversification, growth and development
- Promote the development of a skilled workforce and the provision of local jobs.

Through these objectives, Mount Isa, Moving Ahead establishes an overarching focus for the Critical Infrastructure Strategy which has guided the ideas generation and prioritisation of the critical infrastructure projects and actions.



2.2 Role of Council

Mount Isa, Moving Ahead recognises Mount Isa City Council’s committed to providing foundations for growth by working within its remit as a local government authority to drive both community and economic outcomes for the City. Similar to its role in Mount Isa, Moving Ahead, Council will foster sustainable economic transformation and development by delivering on the actions in the Critical Infrastructure Strategy and Implementation Framework through the following functions:

- **Planning and advocacy:** Progress or support planning of initiatives and advocate for funding and delivery
- **Reform:** Identify and implement reform areas to support actions and enable economic opportunities, such as through land use planning or development approvals
- **Infrastructure and service delivery:** Collaborate with stakeholders to ensure that the fundamental enablers for investment and economic development are addressed by planning for and providing local and regionally significant infrastructure in an informed, planned and co-ordinated manner.
- **Investment attraction and business support:** Promote the Transformation of Economic Strategy and engage with potential proponents to generate interest. Liaise with industry and local businesses to support growth and ensure community needs are met.

2.3 Industry development pillars

Council has established six pillars of the economic base of Mount Isa which are presented in Figure 6. Strategies and actions established through each of these pillars will support the diversification and transformation of Mount Isa’s economy to build resilience and ensure the community’s future prosperity.

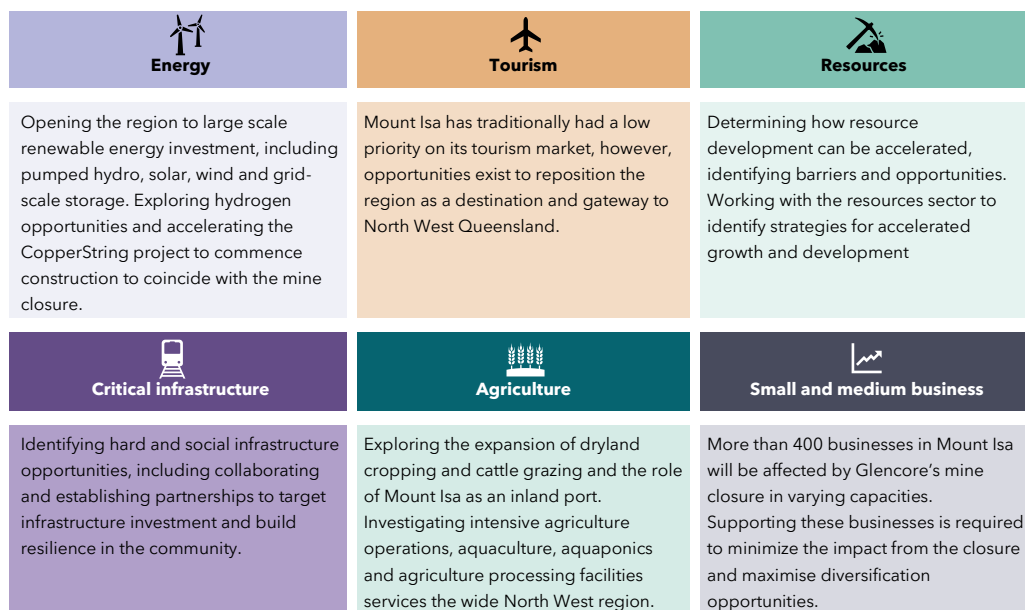


Figure 6: Six pillars of the economic base



2.4 Critical Infrastructure pillar

Critical infrastructure is a central pillar of the economic base, as it will not only be catalytic for economic transformation, but it will also be an enabling component of the other pillars' strategies, therefore instrumental to realising opportunities in the region.

The Australian Government defines critical infrastructure as infrastructure which provides services that are essential for everyday life, such as energy, food, water, transport, communications, health and technology.⁸ Mount Isa's economy is supported by several of these industries, with strengths and competitive advantages in some areas, and gaps or challenges in others.

Within the critical infrastructure pillar, Council has defined the scope as identifying hard and social infrastructure projects, including collaborating and establishing partnerships to target infrastructure investment and build resilience in the community. As such, for the purposes of the Strategy's development, three types of infrastructure were defined to guide the identification of projects and imitative that have the capability to drive or support economic transformation for Mount Isa (Figure 7), including:

- **Core infrastructure:** Enabling projects and upgrades to maintain economic activity, community wellbeing and liveability
- **Critical infrastructure:** Projects that support existing activities to grow and provide reliable ongoing jobs
- **Catalytic infrastructure:** Projects that generate new, expanded or diversified economic activities.

Through the Strategy's development, seven key sectors of the critical infrastructure pillar were identified and used to guide the planning and development of actions and strategies. These sectors are:

- Community infrastructure
- Health and social infrastructure
- Transport
- Energy and resources
- Water and agriculture
- Judiciary
- Defence.

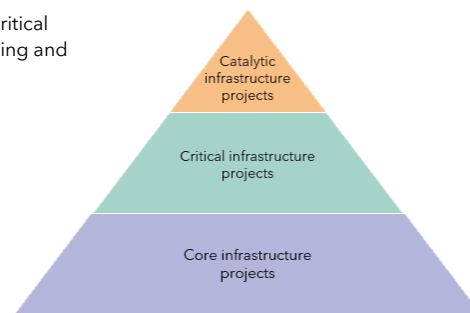


Figure 7: Three types of infrastructure

These sectors demonstrate the clear linkages between the critical infrastructure pillar and the other pillars of the economic base, particularly including energy, resources and agriculture.

2.4.1 Objectives and measures of success

Enduring and sustainable diversification of the Mount Isa economy is the ultimate goal of the Strategy to achieve for the future prosperity of the region. Fundamentally, the Critical Infrastructure Strategy is seeking to identify projects, actions and strategies that:

- Meet the needs of Council and the community
- Drive or support job growth and the transformation of the economy
- Are a mix of optimal small, medium and large scale infrastructure projects.

To ensure the strategy can deliver on these objectives, measures of success were identified which have informed the ideas generation and prioritisation process and will be essential tools for tracking progress in the implementation framework. These measures are mapped to the objectives in Figure 8.

⁸ Australian Government. (2021). Critical infrastructure. <https://www.nationalsecurity.gov.au/protect-your-business/critical-infrastructure>



Critical Infrastructure Strategy objectives					
Meet the needs of Mt Isa City Council and the community		Drive or support the transformation of the economy		Deliver an optimal mix of small, medium and large scale catalytic, critical and core infrastructure projects	
Impact measures of success				Commerciality measures of success	
Aligning to Council planning and objectives	Meeting community and social needs	Creating jobs and new skills pathways	Driving economic outcomes	Meeting deliverability, timeframe and cost expectations	Diversifying the economy or leveraging existing industries

Figure 8: Objectives and measures of success

2.4.2 Current state

Setting the baseline is an integral component of a strategy’s development as it sets a benchmark to assess, monitor and measure progress on achieving the desired objectives. A robust analysis of the current state ensures accurate monitoring and control of costs associated with the strategy and assists in managing stakeholder expectations.

The current state of critical infrastructure in Mount Isa can be considered from the perspective of its strengths and challenges. Council has analysed its comparative and competitive advantages from an enabling infrastructure and services lens, to inform the competitiveness profile in Mount Isa, Moving Ahead. Figure 9 highlights this self-assessment of strengths and attributes against challenges and constraints, as articulated in Council’s Economic Development Strategy 2023-248.

Strengths and attributes	Challenges and constraints
<ul style="list-style-type: none"> Established modern airport with existing scope for international trade destinations. Home to Royal Flying Doctor Service and School of the Air. Direct rail access to Port of Townsville. Direct road access to Australia’s national highway system. Water reserves in Lake Moondarra and Lake Julius. Quality pre-schools, primary and secondary schools Tertiary training through various RTOs, TAFE Queensland, Mount Isa Country Universities Centre and JCU’s Centre for Rural and Remote Health. Regional health care, government service, retail, and transport and logistics hub. Sports precinct (Sports Parade) with scope for improvement. Untapped/under-developed residential and industrial land. 	<ul style="list-style-type: none"> Prohibitive cost of flights Road and rail transport infrastructure capacity constraints. High rail freight transport costs. Communications infrastructure/services shortfalls. Power supply constraints (not connected to the national grid) and high energy costs. Water infrastructure capacity constraints and costs. Housing construction/development costs. Land tenure complexities (Native Title). Tourism infrastructure (e.g. accommodation, signage) and visitor servicing shortfalls. Recreational and sporting facilities standards shortfalls. Community services shortfalls (e.g. child care). Access to university courses. Underutilised tertiary training facilities (TAFE). Specialist health care skills and services shortfalls.

Figure 9: Strengths and attributes, challenges and constraints identified by Council

Building on this work, the economic and environmental scan and stakeholder engagement process has established a clear picture of the current state of infrastructure in the region, the challenges that industry and businesses are facing and opportunities for investment and development. Projects in the local, State or Federal Government infrastructure pipeline are included in the longlist in Chapter 3. Further detail on the economic and environmental scan and stakeholder engagement findings is included in Appendix A and Appendix B respectively.

The current state of each critical infrastructure sector is summarised overleaf.



Community infrastructure: As the service ‘hub’ for the North West, it is important that Mount Isa provides residents and visitors with quality services and amenities. There is strong interest from the community to stay in Mount Isa, but investment in infrastructure is required to improve amenity and liveability. CBD infrastructure and housing is aged, tourism infrastructure is dated and there is a lack of quality accommodation for visitors. While not a major driver of employment, investment to address the gaps and improve community amenity and liveability will be critical to ensuring that people choose living and working in Mount Isa over fly-in-fly-out (FIFO), as it transitions to a more diversified economy.



Health and social services: North West Hospital and Health Services (HHS) is currently picking up the gap left by rural and remote primary care, meaning that patients are presenting to the hospital with minor health issues and sickness, taking up essential service capacity. As the health hub for the North West, rural and remote residents rely on services in the City, with the hospital general ward often at or exceeding capacity. There is a lack of critical services in high demand such as renal dialysis, complex needs-related aged care and mental health, and some health infrastructure is aged and not fit-for-purpose. Demand pressures are exacerbated by populations from the NT coming into Mount Isa for treatment, without a service level agreement or patient transport scheme in place.



Transport: Given the region’s abundance of minerals and mining operations, transport and logistics is a major industry in the North West with rail, road and air all essential to Mount Isa’s economy. There are several challenges associated with rail infrastructure connections in the region, including poor resilience and reliability, operational limitations, barriers to access and high cost. The Mount Isa Rail Line is out-of-action for extended periods of the year due to severe weather events, impacting businesses productivity. Offsetting this is the significant latent capacity of the line, with up to half of its potential volume remaining unallocated, should the economics of rail transport be enhanced. In terms of road infrastructure, some roads are not fit-for-purpose, with mine access roads often unsealed and only one lane, despite heavy traffic including B-Doubles and road trains creating poor conditions and safety concerns. While the airport is operating efficiently, there is limited additional capacity for aircraft, particularly on the days that align to fly-in-fly-out (FIFO) schedule. Transport is also enabling infrastructure for other pillar opportunities to be realised. Investment in transport is crucial to economic transformation and diversification, and should be prioritised.



Energy and resources: As two of the five pillars being investigated by Council, energy and resources infrastructure will be key to Mount Isa’s economic transformation. Mount Isa is not connected to the National Electricity Market (NEM) which means that access to reliable and cheap energy can be difficult. There is also some uncertainty around future investments energy and resources, including the connection of CopperString to Mount Isa (despite being included in the State Government’s Queensland Energy and Jobs Plan) and the future of Glencore’s smelter which is a critical component of the resources supply chain in the region.



Water and agriculture: Agriculture is also one of the five pillars being investigated by Council, with access to reliable water being a key enabler of this industry, which is considered a challenge by many local producers. However, it is understood there is sufficient water supply in the Gulf catchment but commercially restricted allocations and a lack of understanding of the water product and associated regulations which is resulting in inefficient use of this critical input for industry development. Nevertheless, evaporation is a key issue and there has been historical underinvestment in water and wastewater infrastructure in region, which places water quality and reliability at risk. This challenge is exacerbated by a lack of local skilled labour to complete water engineering works.



Judicial There is unmet demand for judicial infrastructure. Local divisions have seen substantial growth recently, including a new Vulnerable Persons Unit tasked with working with victims of domestic and family violence. Domestic and family violence is the most common offending pattern in the region and there is a lack of infrastructure to support victims. The watchhouse regularly exceeds its built capacity and there is limited capacity at the local residential rehabilitation centre. Community rehabilitation services in the area are extremely limited, which impacts the ability for referrals from Queensland Police



Defence: The Australian Defence Force (ADF) has a presence in Mount Isa through the Delta Company 51st Battalion of the Far North Queensland Regiment. This is a small core unit and larger group of community-based army reservists. Mount Isa is not identified as a current or future priority site under published Defence strategy, but is infrequently used as a staging / refuelling point for activities across Northern Australia on an as-needs basis. Current airport facilities are limited in their capacity to assist air force activities. While there are complex strategic and operational challenges with the expansion of the ADF in Mount Isa, it remains an avenue for further economic



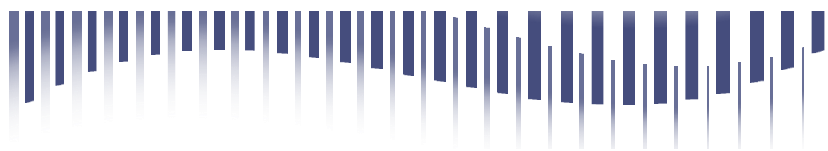
Service (QPS) and Queensland Correctional Services (QCS) to address root causes of offending behaviour. development, potentially as one user (but not a driver) of future industrial facilities such as a Transport Logistics Centre.

2.4.3 Challenges and opportunities

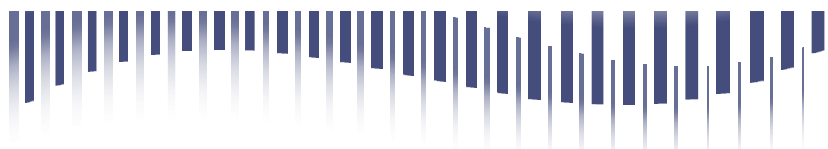
The economic and environment scans and stakeholder engagement process also helped to define the challenges and opportunities for each sector under the critical infrastructure pillar in Mount Isa, as described in Table 3.

Table 3: Critical infrastructure challenges and opportunities

Challenges	Opportunities
Community infrastructure	
<ul style="list-style-type: none"> • Housing supply and quality: There is limited supply of quality housing or executive style housing, with most local homes being modest in nature and much of the stock being aged and weathered. This makes it less attractive for workforces to live in Mount Isa, choosing FIFO over finding a local home to buy or rent. • General town amenity: CBD infrastructure is seen as aged and does not appropriately reflect Council’s vision of “Making our good city great, through innovation, diversification and cultural enhancement”. Ageing and poorly maintained city infrastructure was seen as a barrier to creating a sense of community pride and potentially limits opportunities for investment. • Childcare: Limited access to childcare is considered a barrier to some parents being able to seek employment. • Tourism infrastructure and accommodation: Tourism infrastructure is seen as dated and there is a lack of quality accommodation for visitors in town. Mount Isa hosts the largest rodeo in the southern hemisphere and poor infrastructure and accommodation may lead to less return visits by tourists or event holders over time. There is also considerable opportunity for expansion of cultural and outback tourism, however, further enabling infrastructure would be required for this opportunity to be realised. 	<ul style="list-style-type: none"> • Lifestyle blocks: Increasing supply of lifestyle blocks may appeal to people wanting more of the country lifestyle while still being close to the city. A rural-residential land release and focus or requirement to build quality homes may increase the attraction of living near town. This would take advantage of Mount Isa’s comparative advantage of being a beautiful rural location, with the services of a regional city. • Mixed use developments: The recently developed CBD masterplan proposed a mixed-use development in the CBD with potential for accommodation, government offices, some retail on the ground floor and childcare to fill the gap in the region. • A program of works for town beautification: There is an opportunity for a program of small, shovel ready works to improve town amenity and liveability that can keep Glencore workers engaged until opportunities arise elsewhere, such as through initiatives resulting from the economic transformation strategy. Examples include improved streetscaping of the key routes into the city, such as from the Airport, family-friendly infrastructure to improve the amenity of particular parts of the city, such as walkways along Breakaway Creek, and communal infrastructure in more disadvantaged parts of town, such as facilities at the riverbed where groups are likely to continue to congregate.
Health and social services	
<ul style="list-style-type: none"> • Failing primary care: North West HHS has to pick up the gap left by rural and remote primary care, meaning that patients are presenting to the hospital with minor health issues and sickness, taking up essential service capacity. • Hospital infrastructure is aged and not fit-for-purpose: Hospital infrastructure is run down and not fit-for-purpose: <ul style="list-style-type: none"> - There is insufficient capacity to meet demand, with the aged general ward having limited bed supply. - There is no inpatient mental health facility or dry-out facility in Mount Isa, meaning that patients must use beds in the general ward, further limiting supply. 	<ul style="list-style-type: none"> • Holistic approach to care: North West HHS has an unfunded masterplan for the health precinct. Regional and rural communities are increasingly combining hospitals and primary care services which could be an opportunity to streamline and improve health care in Mount Isa. This will support the aging population that is expected to remain in Mount Isa despite the mine closure with holistic care and chronic disease / mental health management, placing less pressure on long-stay beds in the hospital system. • Treatment in region: There is a clear opportunity to reduce health costs by investing in infrastructure and technology so that patients are treated in region rather



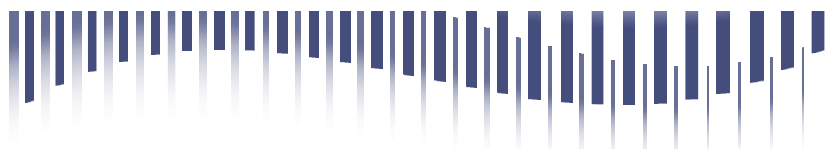
Challenges	Opportunities
<ul style="list-style-type: none"> - Renal dialysis treatment is a major gap in the region, with a high level of demand and patients being transferred to Townsville. • Transfer to Townsville: As a result of the aged and not fit-for-purpose infrastructure, many patients are transferred to Townsville for treatment, adding to the costs of care for North West. This also creates poor social outcomes, as residents are treated away from home and do not have their support networks close by. This is particularly challenging for Indigenous communities. With around half of all patients being Indigenous, moving people off country for care has cultural consequences. • No public residential aged care: While there is existing capacity at the Laura Johnson Home for general aged care placements, there is no public residential aged care service in Mount Isa to alleviate demand for long stay hospital beds for those with more complex care needs (such as dementia or NDIS-needs), with residents who cannot afford private services moving away from families and friends to Townsville for care. This problem will worsen in the short to medium term as the population expected to stay in Mount Isa ages. • Limited domestic and family violence support: There is no accommodation or dedicated support service for people fleeing domestic and family violence. 	<p>than being transferred to Townsville. Infrastructure investment priorities could include:</p> <ul style="list-style-type: none"> - Medical ward upgrade (generally medicine and surgery) - Dedicated inpatient mental health facility - Renal unit upgrade - Residential aged care facility for complex care needs, which has the potential to create a considerable number of skilled and unskilled jobs. - Hospital in the Home (HITH) outreach service to care for people in community <ul style="list-style-type: none"> • Accommodation to support staff: Additional supply and improved accommodation for hospital workers will help to attract and retain staff to meet demand and ensure a high level of care. It should be noted, however, that a variety of employers, public, private and not-for-profit, offer staff housing as an employee attraction proposition, but this is currently not sufficient to address the inherent skills shortage and workforce retention challenges faced.
Transport	
<p>Rail:</p> <ul style="list-style-type: none"> • The volumes and demand transported on the Townsville to Mount Isa rail line are seen to be relatively stable, with tonnages unlikely to change significantly in the future. There is a QR Master Plan that may be updated, but tonnages are able to be accommodated within the current infrastructure profile, and smelter feedstock (e.g. acid) is seen to be a more significant determinant of future demand than the mine closure. • Lack of investment: A historical lack of investment in the Mount Isa Line has resulted in several challenges: <ul style="list-style-type: none"> - Resilience and reliability: As a result of limited investment, resilience and reliability are critical issues. During the wet season the line can be out of operations for months at a time, with the most recent event being four weeks in February 2024. - Operational limitations: Historical lack of investment in the line has also created operational limitations. Double stacking of full-sized containers is currently not viable due to structural gauge limitations, several bridges along the route and the general quality of the line. Speed is also a challenge, with a posted speed limit of 80 kilometres per hour, but most trains only reaching 30 to 40 kilometres per hour. 	<p>Rail:</p> <ul style="list-style-type: none"> • Common user infrastructure: There has been considerable investigation into the feasibility of common user rail infrastructure in the region, such as the TLC. This centre could cater to road and rail transport activities, with previously proposed sites strategically located on highways with haulage exposure. Common user infrastructure may reduce barriers to entry, however, viability must be underpinned by sufficient long term demand, ideally through a sizeable foundational user and a diversity of additional users that can mitigate commodity price exposures. Under the Queensland Government's Common User Infrastructure Assessment Principles this infrastructure could be publicly or privately owned. • Double stacking: Enabling half/three quarter double stacking presents an opportunity to improve the efficiency of two-way travel. To achieve this, structural gauge would need to be improved and bridges avoided. There are three bridges west of Stuart (overbridges at Mingela, Charters Towers and Burra), and two bridges east of Stuart which are currently limiting double stacking. The three west of Stuart could be raised or the ground lowered at a reasonable cost to deliver efficiencies. If this was actioned, there is an opportunity



Challenges	Opportunities
<ul style="list-style-type: none"> - Freight flow: Currently, more freight is flowing from Mount Isa to the Port of Townsville, meaning the line is significantly underutilised. on what is largely considered a back haul route. However, Glencore’s future plans of importing concentrate for the smelter due to closure of mine would see additional half height containers travelling west, a practice which at present has not existed. Cement is another commodity that has the potential to travel west on rail rather than road. • Cost: The cost of freight is seen as a barrier to using rail, relative to road transport. Take or pay contracts are also challenging for junior mines that may have less reliable production. - Uncompetitive with road freight: The cost of road freight is seen as more competitive than rail, meaning that heavy freight is often transported in trucks which impacts road conditions and results in greater maintenance requirements. For example, all fuel travels via road due to rail costs and the operational limitations described above, but has in the past been carried on rail. - Network access: Limited competition and the pricing combination of above rail charges and regulated below rail charges is unaffordable for some potential users and creates a barrier to entry for smaller producers and mines. - Collaboration: Limited supply chain collaboration is a barrier to creating efficiencies and driving innovation. <p>Road</p> <ul style="list-style-type: none"> • Some roads are not fit-for-purpose, with mine access roads often unsealed and only one lane despite heavy traffic including B-Doubles and road trains. There is not a consistent view on who’s responsibility it to make road infrastructure improvements, with the State Government, Local Government and individual road users (mines) all potential contributors to future upgrades and an enhanced maintenance program. <p>Air</p> <ul style="list-style-type: none"> • There is limited capacity for additional aircraft at the Airport, particularly on the days that align to the FIFO schedule (Wednesday and Thursday). Mount Isa Airport has turned away tourism charters away in the past as there were no aprons available. This is also the case when the Airforce and/or VIP transport requires space, which is approximately four to five aircraft a month, disrupting regular commercial flight schedules. While not an infrastructure consideration, the high cost of commercial flights to Mount Isa was cited as a barrier to future growth of air services. 	<p>for freight to double stack from Mount Isa to Stuart and then go from Stuart to the Port via road.</p> <ul style="list-style-type: none"> • Resilience measures: Investment in drainage and resilience measures are critical to the future use of the rail line. It is noted that investment has been decreasing over time, despite access charges remaining high. • Access subsidies: Rail access subsidies for junior mines may support production and economic growth. It was acknowledged that there are above rail operators in the region that provide an aggregate service to reduce costs for junior mines, and that trials have been run to reduce access charges for junior mines so that they establish operations. • Western rail: A rail line to Tennant Creek presents an opportunity to increase western freight flow and ‘unlock’ access to resources and agricultural industry in the Northern Territory. However, this opportunity comes at a significant, multi-billion dollar cost and could be detrimental to Queensland freight and logistics industry, as freight may re-direct to the Port of Darwin instead of Townsville. <p>Road</p> <ul style="list-style-type: none"> • To improve safety and reduce consistent maintenance requirements, an obligation was proposed for all access roads to mines with a specific life to be sealed and two-way. • The Flinders Highway is also a key enabler in the region and should be maintained to ensure ongoing safety and efficiency. • Other opportunities include assessing the viability of a state-controlled grader that could be deployed for re-grading during the dry season as part of an enhanced maintenance program. • Opportunities for road infrastructure enhancements include: <ul style="list-style-type: none"> - Improvement of connection of Northridge Road onto the Barkly Highway - Sealing of unsealed roads in general - Raising structures in flood-prone sections of the Flinders and Landsborough Highways <p>Air</p> <ul style="list-style-type: none"> • There is an opportunity to increase apron capacity at the airport to improve flexibility during high-demand periods. There is also potential for a flying school or helicopter school to be located in region to support local activities such as heli-mustering



Challenges	Opportunities
Energy and resources	
<ul style="list-style-type: none"> • Access: Access to energy is essential to establishing new mining operating in the region. Junior mines are struggling to access cheap and reliable energy, and may wait until renewable energy projects are up and running to begin construction and operations. • Uncertainty: The closure of the mine has been compounded by uncertainty and speculation that exists in the city about the future of other investments relating to: <ul style="list-style-type: none"> - CopperString: Despite being included in the Queensland Government’s Queensland Energy and Jobs Plan, there is a heightened level of uncertainty about CopperString reaching Mount Isa which is creating a barrier to some projects progressing to delivery. Large mining projects need access to reliable and affordable energy to reach a final investment decision, and without CopperString, it may be more viable to wait for green energy which cannot be delivered in the short term. - Closure of smelter: While Glencore has committed to keeping the smelter open until 2030, its potential closure presents a supply chain challenge in the region, with the sulfuric acid by-product from its operations critical to several other operations. 	<ul style="list-style-type: none"> • CopperString spurs: There is opportunity for two CopperString spurs in Mount Isa to support the construction and operation of several resources projects in the short term, otherwise, development may stall until green power is available (2030): <ul style="list-style-type: none"> - Southern spur (planned) which is planned to connect to Greater Duchess Copper Gold Project and Phosphate Hill Mine - Northwest spur which would connect to the Eva Copper Project. • Pyrite furnace / sulfuric acid plant: There is a clear opportunity to address the potential gap in sulfuric acid supply in the region and with a pyrite furnace/acid plant. This investment would drive a considerable level of direct jobs, both during construction and operations, and support the ongoing viability of several other industries the support Mount Isa’s economy.
Water and agriculture	
<ul style="list-style-type: none"> • Water quality and reliability: There is ongoing underinvestment in water and wastewater infrastructure in region, which places water quality and reliability at risk. There are potential drinking water risks, created by deteriorating infrastructure and poor staff training. • Lack of skilled labour for water: There is a lack of skilled labour in the region to complete water engineering works, which has resulted in the poor water infrastructure, quality and reliability. • Water cost: The cost of water is considered a major barrier to business. • Understanding of the water product: The understanding of the water market and product is also considered an issue. • Water entitlements: Due to un-supplemented water being treated as a balance sheet asset, owners are unlikely to part with entitlements meaning that water often goes unused despite there being sufficient volumes and high demand. Licences create a book value and there is asset security associated with it that act as a disincentive to negotiation of alternative uses for spare water. • Access to un-supplemented water: There is only a one-time harvesting licence cost to access un-supplemented 	<ul style="list-style-type: none"> • Evaporation control measures: There are several approaches to reducing evaporation, including evaporation curtains and deepening measures such as raising dam walls or dam deepening through dredging. • Trading platform: An improved trading platform or more marketing and education about the existing platform presents an opportunity for accessing supplemented water. • Upskilling: There is an opportunity to upskill some of the mine workforce to transfer into water trades/engineering to address the deteriorating infrastructure in the region. • Ownership and governance: Reconsideration of the ownership of Lake Moondarra and Lake Julius, and/or alternative governance models that incentivise alternative use of water allocations and avoid alternative water requirements such as bore fields. • Agricultural production: Mount Isa is well known for its cattle grazing, however, generally transports its cattle closer to the coast for fattening prior to processing. The Agriculture pillar has been investigating the potential for forage and feedlots to develop the beef supply chain in region, which would then lead to the opportunity for a local abattoir.



Challenges	Opportunities
<p>water, however, land ownership or a commercial arrangement with the landowners (e.g., a mining licence) is required. This is a barrier for many agricultural producers in the region that lease their land from Council.</p> <ul style="list-style-type: none"> • Evaporation: Evaporation is key challenge, with a considerable amount of water supply lost as a result. 	<ul style="list-style-type: none"> - Given the challenges associated with a beef only abattoir, there is opportunity for a more diversified and smaller scale operation that also processes game meats which are prevalent in the region. Indigenous communities are already preparing kangaroo meat for human consumption, and there is another abattoir in Longreach which specialises in petfood.
Judiciary	
<ul style="list-style-type: none"> • Recent growth: Local corrective and police divisions have seen substantial growth recently, including the introduction of a new Vulnerable Persons Unit tasked with working with victims of domestic and family violence. Domestic and family violence is the most common offending pattern in the region and there is a lack of infrastructure to support victims. • Prisoner transport: Prisoner transport comes at significant cost and risk. Approximately \$3 million per annum is spent on overtime to conduct prisoner transport. This leads to not only budgetary overrun but also staff burnout. Prisoners released from Townsville or Rockhampton will often fail to attend supervision as directed due to the logistical challenges of travel. • Lack of capacity: The watchhouse regularly exceeds its built capacity, which has drawn the attention of both the Queensland Police Union and Amnesty International due to possible human rights concerns. There is a residential rehabilitation centre in Mount Isa with very limited capacity and, individuals will often be held on remand while waiting for space to open in this facility. Community rehabilitation services in the area are extremely limited, which impacts the ability for referrals from Queensland Police Service (QPS) and Queensland Correctional Services (QCS) to address root causes of offending behaviour. 	<ul style="list-style-type: none"> • Infrastructure needs: With approximately 600 offenders under active supervision across Mount Isa, there is an opportunity to expand or upgrade the built infrastructure to meet demand and growth. Staff facilities are also in need of expansion and upgrade, which would help to encourage the workforce to live in region. • Proposed correctional centre: There is a clear opportunity for a new correctional centre in the region with capacity to support demand in Mount Isa as well as correctional facilities in Townsville and the Atherton Tablelands. The facility has the potential to generate hundreds of local jobs during construction and operations, which would drive a considerable level of economic activity for Mount Isa while addressing a social challenge in the region. • Diversionary and Youth Justice: There is also opportunity for a pre-judicial or diversionary program for youth or adults at risk of entering the criminal justice system. This facility would likely be run by a not for profit / for purpose enterprise. With respect to the community and identity of Mount Isa this centre could have a work / agricultural focus. It could also have a focus on at risk First Nations individuals with a focus on connection to country and traditional healing practices. •
Defence	
<ul style="list-style-type: none"> • Operational strategy: The ADF has been clear in recently published strategy reviews that while Northern Australia is a part of their future posture, this is likely to use existing basing and coastal force projection. Mount Isa is not identified as a current or future priority in this refreshed strategy. • Slow investment timeline: Although recent changes to the National Defence Strategy (moving to a two year review cycle) have increased the agility at which the ADF can make investment and growth decisions, they are still subject to a number of constraints within the Government systems that mean investment decisions often eventuate over a large horizon. • Infrastructure investment: The ADF has indicated a general preference for utilising existing infrastructure, 	<ul style="list-style-type: none"> • Defence personnel: ADF personnel in North West Queensland are largely reservist in nature but often demonstrate a significant connection to the region, and can be valuable contributors to local economies. • Transport and Logistics: The view was expressed by the ADF that the transport and logistics space is the most promising avenue for further investment in Mount Isa. Mount Isa has a comparative advantage in it's strategic location between ADF assets in the South East, Darwin and Townsville. • Training exercises: There may be some capacity in the future to consider Mount Isa for temporary training exercises. This could be influenced by expansion of the airport apron, but is not dependent on such an infrastructure upgrade. The ADF would likely see any

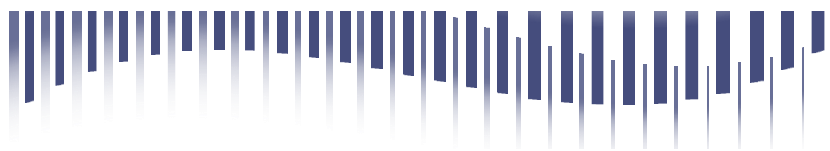


Challenges	Opportunities
<p>and temporary infrastructure solutions that meet immediate needs, as opposed to major investment in new, common user infrastructure.</p>	<p>such mobilisation as temporary in nature and largely self-reliant (i.e. the impact on the City from a social infrastructure and liveability perspective would be minimal). There is some potential that friendly-country training exercises (such as those undertaken by Singapore in regional Queensland previously) may also adopt a similar approach.</p>

2.5 Summary

Analysis of the current state, challenges and opportunities was a foundational aspect of the Strategy’s development. This work informed the development of a longlist of 75 critical infrastructure projects that have the potential to drive or support industry diversification, job creation and economic growth.

The longlist, and the approach to assessing and prioritising the projects to a shortlist of those that meet the needs of Council and the community, have the greatest potential to drive economic transformation and are a mix of small, medium and large scale initiatives is described in Chapter 3.



3. Project identification and assessment

This chapter details the approach to identifying a longlist of infrastructure projects that have the potential to support economic diversification and transformation, and the methodology for shortlisting targeted initiatives for further development and consideration. This chapter includes:

- Approach
- Longlist
- Categorisation
- Multi-Criteria Assessment
- Shortlist.

3.1 Approach

The approach to identifying and assessing the projects and initiatives for inclusion in the Critical Infrastructure Strategy is presented Figure 10 with further detail on each step described below. This filtering process incorporates aspects of contemporary guidelines for assessing infrastructure projects, including the Queensland Government's Project Assessment Framework (PAF) and the Infrastructure Australia (IA) Assessment Framework (IAAF). However, given the size of the longlist and the level of detail at this stage of analysis, these frameworks were not followed prescriptively.

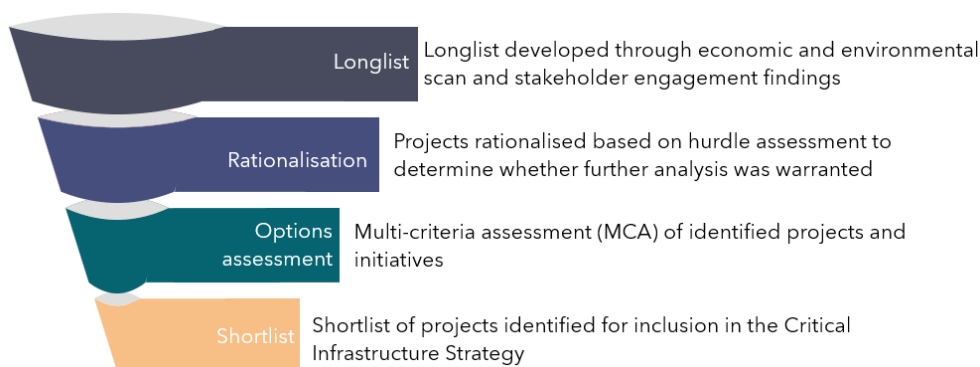
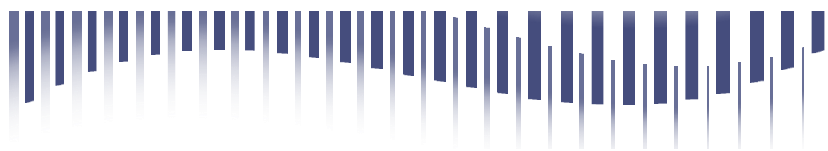


Figure 10: Approach to project identification and assessment

- **Longlist:** A longlist of 75 potential infrastructure projects was identified through the current state assessment, economic and environmental scans and stakeholder engagement process. Industries covered in the longlist include aerospace, agriculture, education, energy, health, liveability, police/judiciary, rail, road, resources, technology, waste, water and defence. Each project was allocated to an infrastructure type (e.g., core, critical and catalytic).
- **Rationalisation:** The longlist was rationalised through a hurdle assessment process, where each project was considered in terms of its current status (i.e., if it is already on a local, State, or Federal Government infrastructure pipeline), and whether it:
 - Is strategically aligned to Council's planning and vision for the region
 - Responds to the problem of job losses and lack of economic diversification;
 - Can be delivered in time to address the problem



- Is cost prohibitive.
- **Options assessment:** Following the longlist rationalisation, 28 projects were assessed via an MCA guided by the Strategy’s objectives and measures of success in Chapter 2. Outcomes were tested, revised (where required) and confirmed during a workshop with Council.
- **Shortlist:** Shortlist of 10 projects identified for inclusion in the Critical Infrastructure Strategy and five projects highlighted for further consideration.

3.2 Longlist

The longlist of projects captures all soft and hard infrastructure projects that may support Mount Isa in its economic transformation journey. This ranges from small works already allocated funding in the MICC 2023-24 Budget, to Federal and State infrastructure pipeline projects, initiatives which have been investigated in the past (such as the Transport and Logistics Centre), to ‘blue sky’ ideas generated during the stakeholder engagement and economic and environmental scan phases.

The longlist of 72 projects and initiatives includes:

- 11 catalytic projects that have the potential to diversify the economy, strengthen emerging industries or unlock new opportunities, and create new jobs
- 23 critical infrastructure projects that are essential to growing existing industries and their workforces
- 38 core infrastructure projects that are enabling infrastructure or will support or maintain community liveability or economic activity.
- Figure 11 presents the split of projects under each infrastructure type and sector.

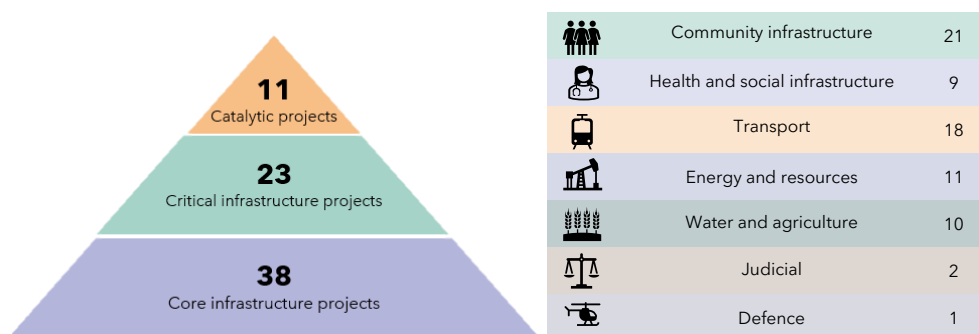


Figure 11: Longlist infrastructure types and sectors

The longlist of infrastructure projects, infrastructure types and categories are presented in Table 4.

Table 4: Longlist

Project	Description	Sector
Core infrastructure		
Accelerated capital works program	Combining a number of Council capital works projects and bringing them forward in packages that enable transferability of skills from Glencore mine workers who have stated a preference for remaining in Mount Isa. MICC has a proposal to the Queensland Government for this project. This project could include works for City beautification including refreshing town infrastructure, city scaping and urban renewal. Focus would be on key routes into/out of the	Community infrastructure



Project	Description	Sector
	city, and key intersections in the city centre. (refer to Mount Isa streetscape masterplan).	
Centennial Place upgrades	This project is on Council's infrastructure pipeline and included in the MICC 2023-24 Budget. It involves improvements to the public space featuring green areas, public dining and shade.	Community infrastructure
Enabling works for new lots (100 lots)	Enabling works such as services connections for 100 new housing lots in Mount Isa. This project is included in the planning section of NWQROC's draft infrastructure masterplan.	Community infrastructure
Executive style housing	Provision of housing quality commensurate with salaries that are attracted by the resources sector and any emerging industries which may deliver a high median salaried employee to the region. Note there is a block at King Fisher Estate that Glencore is open to negotiating with Council for development, which is subdivided and has all services connected..	Community infrastructure
Footpath renewal and upgrades	This project is on Council's infrastructure pipeline and included in the MICC 2023-24 Budget. It include renewal works, replacement and upgrade of CBD footpaths.	Community infrastructure
Library upgrade	Council has applied to the Growing Regions Fund to upgrade the library - there is potential here for the upgrade to house or work with a future expanded CUC Mount Isa.	Community infrastructure
Lifestyle blocks	Planning for larger residential blocks to increase liveability of the Mount Isa region, as opposed to typical residential blocks. These larger blocks should allow size for a hobby farm / minor personal agricultural pursuits.	Community infrastructure
Liveability - Precincts and attraction	Liveability and tourism - infrastructure associated with public precinct improvements, such as: lagoon, cinema, playgrounds, improved rodeo facilities and attractions to attract more people to the region and make Mount Isa a space to live and visit for North West residents.	Community infrastructure
Public transport provision	A bus service through the city and suburbs that supports school runs as well as general transport around the city, with a public transport hub located near the Kmart shopping area.	Community infrastructure
Recreational infrastructure at Lake Moondarra	Upgraded community infrastructure at Lake Moondarra, including walking trails, secure camping facilities, and fishing pontoon (noting the fishing pontoon is included in Council's infrastructure pipeline).	Community infrastructure
Renewal/quality uplift of housing stock	Renewal of housing stock in Mount Isa focussing on: <ul style="list-style-type: none"> • Social housing in the short-term including a quality uplift works program such as painting, minor maintenance activities, fences etc. • Broader funding allocation over the long term for private properties if demand warrants investment through a grant program 	Community infrastructure
Residential accommodation for public service	Additional / improved residential accommodation for Queensland Police Service and other key Government agencies likely to require a future expansion of staff accommodation. Residential accommodation for QPS is currently on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage.	Community infrastructure



Project	Description	Sector
Water-play facility upgrade	This project is on Council's infrastructure pipeline and included in the MICC 2023-24 Budget. It includes an upgrade to Mount Isa's Splashez Aquatic Centre to provide expanded family-friendly activities in the city.	Community infrastructure
Expansion to Country University Centre (CUC)	Future expansion of the CUC Mount Isa with specialised infrastructure (e.g. agricultural, mining, or other technical facilities). In its current form, the facility is just opening, however, the current building is a rental.	Health and social infrastructure
Growth planning for local schools	This project is listed on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. It involves undertaking growth planning at four schools in the north and western regions.	Health and social infrastructure
Playground upgrades at local schools	This project is listed on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. It involves upgrading playgrounds at 10 schools in North and North West Queensland.	Community infrastructure
Rehabilitation ward at Mount Isa hospital	Additional ward at NWHHS for long-term rehabilitation/dry-out patients to support recovery in community and free up capacity on the general medicine ward. There are only four sub-acute beds for rehab at the hospital - a rehab ward would support long-stay patients and improve bed flow.	Health and social infrastructure
Spinifex College - infrastructure upgrades	This project is listed on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. This project includes the Spinifex State College - senior campus amenities upgrade and student residential security fence.	Health and social infrastructure
Aircraft apron	An additional apron at the Mount Isa Airport to increase operational flexibility, capacity, and ability to cater to high-demand periods. Specifications of the apron would be determined through a demand analysis in consultation with Mount Isa Airport.	Transport
Common user access road between Mount Isa and Eva Copper Project	A common user access road connecting Mount Isa to the Eva Copper Project which could also support the Barbara mine, depending on the route.	Transport
Lake Julius access road upgrades	This project is listed on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. It includes addressing recurring damage to the Lake Julius access road and assessment of other road assets by rectifying or upgrading, to ensure fit for purpose condition and greater long term resilience.	Transport
Mount Isa bypass	A heavy vehicle route to bypass Mount Isa city has the potential to significantly improve the existing road network by moving the freight task out of the town centre. It also has the potential to increase the efficiency of road freight and creates an opportunity for private development of roadhouse facilities along the bypass.	Transport
Mount Isa Line upgrades	Flood resilience measures: Upgrades to the Mount Isa Line to improve flood resilience so that the line can remain operating where possible during wet season and to reduce the cost of ongoing maintenance post flooding events. Structure gauge upgrade: Line upgrades to enable double stacking including works to improve pinch points west of Stuart.	Transport



Project	Description	Sector
Mount Isa to Rockhampton corridor upgrade	This project is listed on the Australian Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) - Infrastructure Investment Program, and is therefore in the planning or delivery stage. It involves targeted upgrades to the Landsborough Highway, the Capricorn Highway and surrounding state and local roads.	Transport
Renewal of sealed roads	This project is on Council's infrastructure pipeline and included in the MICC 2023-24 Budget. It includes the renewal of sealed roads in Mount Isa and Camooweal.	Transport
Road network specifications for mine access	Defining a set of requirements for access roads to mines with a specified mine life to ensure roads are adequate and fit-for-purpose (e.g., all roads connecting from Mount Isa to mines with a life of greater than 50 years must be sealed and double lane).	Transport
Roads to Recovery program (X7)	This project is listed on the DITRDCA - Infrastructure Investment Program, and is therefore in the planning or delivery stage. The Roads to Recovery Program supports the construction and maintenance of the nation's local road infrastructure assets, which facilitates greater accessibility and improves safety, economic and social outcomes for Australians. There are seven projects on local roads in the Mount Isa region which fall under this program of work.	Transport
Road upgrades and maintenance	<p>New bridges, crossings and sealing upgrades for:</p> <ul style="list-style-type: none"> Cloncurry-Duchess Road (new bridge at Malbon River) - TMR ownership Mount Isa-Duchess Road (seal 80km) - MICC, Cloncurry Shire Council Riversleigh Road (Lawn Hill to Gregory Downs-Camooweal road, seal 80 km) - MICC, Burke Shire Council Kajabbi-Mount Isa Road (upgrade Leichhardt River crossing and 4x causeway crossings) - MICC, Cloncurry Shire Council <p>These projects are included in the planning section of NWQROC's draft infrastructure masterplan.</p>	Transport
Blackspot Infill Feasibility Modelling	Address the mobile blackspot from Mount Isa to Dajarra. This project would involve conducting feasibility modelling and would be lead by QCN. This project is included in the planning section of NWQROC's draft infrastructure masterplan.	Energy and resources
Energy-efficiency upgrades	This project is on Council's infrastructure pipeline and included in the MICC 2023-24 Budget. This project includes general energy-efficiency upgrades to Council's infrastructure. Similar to capital works acceleration, this may enable transferable skills to be utilised from the existing Glencore workforce.	Energy and resources
Fred Haigh pump station electro-mechanical overhaul	This project is listed on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. It involves continued renewal of high-voltage yard and electro-mechanical equipment at Fred Haigh Pump Station.	Energy and resources
Lake Julius power pole replacement	Replacement of old timber poles and cross-arms of the Lake Julius 66kv power line with bushfire resistant materials (concrete and steel).	Energy and resources
Evaporation control measures	There is an opportunity to install a range of evaporation control measures that would help water availability, pricing and access. These include deepening dams, raising dam walls, and installing evaporation curtains.	Water and agriculture



Project	Description	Sector
Maximising water entitlement trading (review and trading platform)	There are large volumes of under-utilised water entitlements across the region. This unused water ultimately reduces the yield of industrial and agricultural production for the region. Reviewing price, volumetric limits and allowing trade of entitlements for periods of over five years would encourage landowners to lease water for extended periods, fostering investment in water-efficient technologies and infrastructure. While existing water trading mechanisms exist, there is an opportunity to develop a more streamlined approach to water trading including the development of new dedicated online platform	Water and agriculture
Second pathogen disinfection system	This project is listed on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. It involves the installation of new ultraviolet disinfection system as second pathogen barrier for the potable water supply to MICC.	Water and agriculture
Stormwater infrastructure renewal and upgrades	This project is on Council's infrastructure pipeline and included in the MICC 2023-2 Budget. It includes upgrading and renewal and stormwater infrastructure.	Water and agriculture
Terminal Reservoir filtration membrane modules	This project is listed on the DSDI - Queensland Infrastructure Pipeline therefore is in the planning or delivery stage. It involves the completion of staged replacement of the filter membranes at Mount Isa Terminal Reservoir.	Water and agriculture
Mount Isa Diversion Centre upgrade	This project is listed on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. It involve upgrading the Arthur Petersen Diversion Centre as a custody alternative for public intoxication offences.	Judicial
Critical infrastructure		
Administrative government workforce consolidation / call centre	This project could be a blend of a public sector administrative hub and/or call centre. The hub would enable State Government workers who predominately service North West Queensland, some of which could be from the Glencore workforce post mine closure, to be based in Mount Isa. This hub could also include an on-shore government department or public service provider call centre (e.g., Centrelink, Energex, Telstra, NBN, APA (dial before you dig)). There is potential for a low cost option that could use an existing facility (e.g. Civic Centre) and seek partnership with government as a client.	Community infrastructure
Convention centre / five-star accommodation	Development /investment attraction of a five-star accommodation facility with a convention centre style space to support local tourism and attract resources, agricultural and other rural/regional conferences at a large scale.	Community infrastructure
Data storage centre	Leveraging the fibre optic cabling provided by CopperString, the development of a data storage facility in or around Mount Isa. Noting, however, that data storage centres generally require a lot of energy production, a cool environment, and proximity to industry.	Community infrastructure
Materials Recovery Facility	This project is on Council's infrastructure pipeline and included in the MICC 2023-24 Budget. The facility is designed to process kerbside recyclables from residential solid waste, select commercial and industrial waste, and certain	Community infrastructure



Project	Description	Sector
	materials, including cardboard, some metals and Container Refund Scheme containers, such as glass and plastic bottles and aluminium beverage cans.	
Mixed use build in CBD	Council's adopted CBD masterplan has an approved mixed-use building for housing, retail, and Government tenancy. This building could include a childcare facility which is an identified gap in the region.	Community infrastructure
Mixed used sporting facilities and Mount Isa Stadium	Establishment of a mixed-use sporting precinct with infrastructure upgrades to allow outdoor and indoor sports. Potential for this to be expanded to include delivery of a Mount Isa stadium primarily for community use but also for commercial use.	Community infrastructure
North West Motorsport Precinct	Delivery of the North West Motorsport Precinct as a facility that can provide additional leisure infrastructure for locals, as well as attract motorsport events to Mount Isa. This project is included in the planning section of NWQROC's draft infrastructure masterplan.	Community infrastructure
New rehabilitation facility	This facility would likely be run by a not for profit / for purpose enterprise. It could also have a focus on at risk First Nations individuals with emphasis on connection to country and traditional healing practices.	Health and social infrastructure
Public residential aged care capacity for high and complex needs	Development of additional high and complex care residential aged care capacity (public) to accommodate the local ageing population with additional needs such as dementia, mental health and disability. This would reduce the need for residents have to go to Townsville and would keep residents in the region and closer to their families.	Health and social infrastructure
Replacement of renal unit	Replace / upgrade the not fit-for-purpose renal unit and expand renal dialysis capacity so that people can be treated locally rather than going to Townsville.	Health and social infrastructure
Telescope / space centre	Space learning centre and telescope attraction (similar to the Parkes Observatory), leveraging Mount Isa's dark sky potential	Health and social infrastructure
Urgent care/domestic and family violence accommodation	A dedicated accommodation and urgent care facility for people fleeing domestic and family violence.	Health and social infrastructure
Existing terminal upgrade / improvement	Expansion of the existing transport facilities on the rail line in the city, through collaboration with Toll or one of the other major landholders. Expansion of the existing facility has the potential to reduce access costs to the line and stimulate transition from road to rail. Adding to the existing operation would discount the need for expending high upfront capital costs in building a rail extension or access road to the new TLC site.	Transport
Helicopter flying school / training facility	A helicopter flying school or training facility to support heli-mustering in region. Currently people training for heli-mustering travel to Townsville or Brisbane. The region could focus on becoming a hub related to this industry, which would have a broader economic impact and aligns with existing agricultural activity in the region.	Transport
Mount Isa to Tennant Creek Railway	The Mount Isa to Tennant Creek Railway (MITCR) has been under investigation in various forms since 2016. The most recent analysis by DeltaPearl indicates this would not be viable on its own but requires government to open surrounding regions for mining development.	Transport



Project	Description	Sector
Priority Development Area (PDA) development along rail line	There is an opportunity to develop a PDA along the existing rail line to attract and incentivise industry through lower barriers to entry and more affordable access.	Transport
Rail access regulatory change / subsidies	Regulatory change for the rail line, or direct subsidies, could help increase access to and affordability of rail transport for local industry participants. Lowering the transport cost for rail could not only help businesses reduce costs but could also help improve the feasibility and success of new businesses.	Transport
Tyre recycling	Tyre recycling plants process tyre waste into byproducts such as rubber chips, granules and powders, heavy and light oils, carbon black, syngas, steel to be reused or sold.	Transport
Duplicate North West Pipeline and Cloncurry Pipeline	Progression of an options analysis and business case to determine viability of a duplicate pipeline to unlock the regional value of Lake Julius for mining and irrigated agriculture: <ul style="list-style-type: none"> • Cost and return analysis of agriculture-only pipeline for low and medium-priority water • Cost-benefit analysis of a duplicate, high-priority pipeline to help unlock benefits of CopperString.. 	Water and agriculture
Irrigation water pricing review	Detailed scheme-specific assessments of irrigation systems to identify impediments to optimal irrigation water use, reasons for the chronic under-utilisation of water and recommended initiatives to overcome these issues and promote higher water use. Consideration should be given to a review of the necessary level of service and efficiency of the channel and supplementary ad hoc irrigation systems required to ensure water can be delivered at the right time and the scheme function effectively. Any assessment must also review the historical contractual basis and pricing principles on which the schemes were developed and assess the impact of current pricing principles on the price levels and water use patterns. This is part of the Making Water Work narrative.	Water and agriculture
Value-added agricultural production (Behind the Farm Gate)	A proposed facility for the manufacturing of biological, medical and food grade quality sesame oil supporting new technology and investigative processes while eliminating high freight costs usually associated with distribution. MITEZ has investigated a site in Camooweal and the project has Traditional Owner support and would provide jobs for First Nations people.	Water and agriculture
Optic Fibre Build	Investigation of the Mount Isa to Tennant Creek Optic Fibre Build along the Darwin/Singapore Route Optic Fibre Link by QCN. This project is included in the planning section of NWQROC's draft infrastructure masterplan.	Energy and resources
Renewable Isolated Networks (Camooweal)	Investigation and planning of renewable isolated networks project in Camooweal by Ergon Energy. This project is included in the planning section of NWQROC's draft infrastructure masterplan.	Energy and resources
Catalytic infrastructure		
Transport Logistics Centre	Development of a common user transport and logistics centre proximate to the rail line and national highway with haulage exposure in Mount Isa. This would include, at a minimum, opportunity for road to rail transfer including a siding. However, at the other end of the scale this could include a	Transport



Project	Description	Sector
(TLC) and road transport hub	comprehensive transport facility as specified in the TLC Business Case. Potential to be co-located with road transport hub that focuses on existing and future road transport fleet, including EVs, drone deliveries and recreational vehicles. The hub would act as a destination / stop over for road freight operators and could include hydrogen refuelling stations, EV charging stations, overnight accommodation, amenities, basic EV services, solar charging opportunities, etc. The hub could also include a dedicated heavy vehicle maintenance facility targeted at road trains, B-Doubles and other heavy vehicles. Maintenance could be angled towards hydrogen vehicles.	
Satellite ground station	There is an opportunity to instigate the development of satellite ground stations in Mount Isa with support from Government to obtain land, ease permits, and offer incentives for industry to leverage Mount Isa's clear airspace and skies.	Transport
Abattoir	The agriculture sector in Mount Isa is heavily focused on the cattle industry, with over 95% of agricultural production coming from grazing. Establishing a local abattoir could strengthen the regions position as a hub for cattle and beef production, by centralising more functions of the supply chain. However, the North West Queensland region is unreliable in terms of the ability to fatten cattle on native pasture, meaning most cattle are transported east for fattening prior to processing. Therefore, a cattle abattoir would require a supply chain approach, including cropping/forage horticulture and a feedlot. Another potential opportunity is a smaller scale / more diversified abattoir including game meets (examples at Longreach and Beaudesert). This could leverage the expertise of the Indigenous communities in the region that sell Kangaroo products.	Water and agriculture
Cave Hill Dam	Proposed 140,000 ML dam 20km south of Cloncurry will provide secure affordable water to develop new irrigated agriculture, support new mining developments with enhanced viability, and guarantee water security for urban and industrial users across the Cloncurry - Mount Isa region. Detailed design / costing is complete, and economic and environmental impact assessments underway.	Water and agriculture
Common user processing plant for Georgina Basin phosphate rock	A common user phosphate processing plant to support mining operations from the Georgina Basin. This project could be a shared investment with Incitec Pivot to process phosphate rock.	Energy and resources
CopperString 2032	This project is on the DSDI - Queensland Infrastructure Pipeline and is therefore in the planning or delivery stage. CopperString is a 1,100 km high-voltage electricity transmission line from Townsville to Mount Isa that will connect Queensland's North West Minerals Province to the national electricity grid.	Energy and resources
CopperString - Northwest Spur	There is an opportunity for a northwest spur from CopperString to connect to the Eva Copper Project. Efficient and cheap electricity is critical to this mine progressing in the short term. Otherwise, development may stall until green power is available (2030).	Energy and resources
CopperString - Southern Spur	The planned southern spur from CopperString to Greater Duchess Copper Gold Project and Phosphate Hill Mine is under investigation by Powerlink.	Energy and resources



Project	Description	Sector
	Efficient and cheap electricity is critical to these mines progressing in the short term and creating construction jobs. Otherwise, development may stall until green power is available (2030).	
Pyrite furnace / sulfuric acid plant	Pyrite furnace and sulfuric acid plant to address potential gap in sulfuric acid supply if the Glencore copper smelter closes.	Energy and resources
North West QLD Correctional Precinct	<p>Low security prison (e.g. Palen Creek) - Commonly referred to as a prison farm, a facility run by the state for lower risk prisoners, and those who have exhibited a pattern of good behaviour. These centres are designed around work and community engagement as a preparatory step for re-entering the community.</p> <p>High security prison (e.g. Townsville Correctional Centre) - High security prisons contain the majority of offenders, they operate with a rehabilitation focus, but with an increased need for safety and security. Further work is required to better define demand/capacity, and role (e.g. high security prison or low security diversion), and market (youth or adult).</p>	Judicial
Airforce/military facility	Dedicated Airforce / military facility established at Mount Isa Airport land including hangar, workshop space, taxiway and apron. Likely to be airside. Purpose is to enable increased military activity in the region.	Defence

3.3 Rationalisation

Given the breadth of the infrastructure longlist and the ‘blue sky’ nature of some of the projects and initiatives, a rationalisation process was implemented to streamline the MCA and ensure the options assessment was targeted and that shortlisted projects are actionable and can deliver the desired outcomes. The rationalisation process used a hurdle assessment approach to determine whether or not a project should be assessed in the MCA. The key considerations of the hurdle assessment uphold to the core objectives of the Critical Infrastructure Strategy, and include:

- Is the project listed on Federal/State/ Local Government pipelines? Projects that are already listed on pipelines are either funded or in the planning stages and do not require further assessment.
- Is the project strategically aligned to Council’s planning and vision for the region? It is considered that projects that do not align to the community’s interests and skill sets may not be successful over the long-term.
- Does the project respond to the problem the region is facing? The core objective of the Strategy is to diversify the economy and create jobs. While social infrastructure is a priority of the Critical Infrastructure pillar, the primary objective is job creation to keep residents in the region.
- Can the project be delivered in time to address the problem? The closure of Glencore’s copper mining operations in 2025 is readily approaching and projects that would take >5 years to eventuate may not be warranted by delivery.
- Is the benchmarked cost of the project commercially feasible? While investment is required to diversify the economy and create jobs, it is unlikely that a significant funding ask could be approved and progressed in the short-to-medium term.

The hurdle assessment allocated each project into one of the following outcome categories in Table 5.

Table 5: Hurdle assessment outcome categories

Category	MCA status	Rationale
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Not progressed	Not assessed in MCA	Does not meet the key consideration identified above and does not warrant further investigation at this time (i.e., cost prohibitive, cannot be delivered in <5 years, does not align to planning or respond to the problem)
Funded / Pipeline	Not assessed in MCA	Included in pipeline / allocated funding therefore already assessed by government and committed in the future.
Short-term delivery	Not assessed in MCA	Smaller scale projects that should be prioritised in the short-term to create intermediary jobs and support the workforce through the economic transformation
Progressed	Assessed in MCA	Project warrants further analysis as it has the potential to respond to the problem or is strategically aligned to council's planning and vision, can be delivered in the short to medium term and is not cost prohibitive

The outcomes of the hurdle assessment are presented in Table 6, including a brief rationale as to why projects were not progressed.



Table 6: Rationalisation outcomes

Progressed (27 projects)	Funded/Pipeline (20 projects)	Short-term delivery (2 projects)	Not progressed (23 projects)	Rationale
Public transport provision	CopperString 2032	Accelerated capital works program, including town beautification	Common user processing plant for Georgina Basin phosphate rock	Project falls under Resource Pillar - to be assessed in that pillar if considered viable
Common user access road between Mount Isa and Eva Copper Project	Lake Julius access road upgrades	Road upgrades and maintenance in the draft NWQROC infrastructure masterplan	Mount Isa bypass	Ruled out in TLC Business Case, funding would be better spent on improving roads / town transport
Urgent care/domestic and family violence accommodation	Water-play facility upgrade		Rehabilitation ward at hospital	This project was combined with the rehabilitation facility project assessed in the MCA
Helicopter / flying school / training facility	Terminal Reservoir filtration membrane modules options		Data storage centre	Doesn't align with Mount Isa geographical advantages / disadvantages due to climate, proximity to industry, and minimal job impacts
New rehabilitation facility	Fred Haigh pump station electro-mechanical overhaul		Expansion to Country University Centre	CUC currently in delivery phase - expansion to be revisited over the long-term if demand permits
Aircraft apron	Energy-efficiency upgrades		Existing terminal upgrade / improvement	Would be too challenging to progress as a private facility
Airforce/military facility	Second pathogen disinfection system		Library upgrade	Would not deliver the jobs and economic activity the Strategy is seeking
Road network specifications for mine access	Centennial Place renewal		Irrigation water pricing review	The Gulf water plan review currently being undertaken by Government may lead to a similar project
Transport Logistics Centre and road transport hub	Residential accommodation for public service		Pyrite furnace / sulfuric acid plant	Critical project to be explored by the Resources Pillar - see Section 3.4.6 - Investigation by DSDI underway
Recreational infrastructure at Lake Moondarra	Stormwater infrastructure renewal		Telescope / space centre	Not aligned to community interests / Council planning and vision. Potentially covered in Tourism Pillar.
Public residential aged care accommodation	Renewal of sealed roads		Abattoir	To be explored further by the Agriculture Pillar
Mount Isa Line upgrades	Footpath renewal and upgrades		Mount Isa to Tennant Creek Railway	Cost and timeframe prohibitive, would need further investigation outside of this Project



Progressed (27 projects)	Funded/Pipeline (20 projects)	Short-term delivery (2 projects)	Not progressed (23 projects)	Rationale
Executive style housing	Lake Julius power pole replacement		Maximising water entitlement trading (review and trading platform)	The Gulf water plan review currently being undertaken by Government may lead to a similar project
Lifestyle blocks	Spinifex College - infrastructure upgrades		Priority Development Area development along rail line	Ruled out in TLC Business Case, funding would be better spent on improving roads / town transport - any variation of this will be investigated in TLC
Liveability - Precincts and attraction	Mount Isa to Rockhampton corridor upgrade		Satellite ground station	Does not align to community interests / Council planning and vision, and does not align with Mt Isa natural or strategic advantages
North West QLD Correctional Precinct	Materials Recovery Facility		Water trading platform	There is an existing platform that is underused and not enough demand for trading to warrant a new platform
Mixed use build in CBD	Roads to Recover program (X7)		Renewable Isolated Networks (Camooweal)	To be explored by the Energy Pillar if viable
Administrative government workforce consolidation / call centre	Growth planning for local schools		Mount Isa Dajarra Boulia Mobile Blackspot Infill Feasibility Modelling	This project is unlikely to create jobs or generate economic activity and does not support or leverage existing industries
Duplicate North West Pipeline and Cloncurry Pipeline	Playground upgrades at local schools		Enabling works for new lots (100 lots)	Increasing housing capacity in the region is risky with the uncertain demand
Cave Hill Dam	Mount Isa Diversion Centre upgrade		Mixed-use sporting facilities and Mount Isa stadium	To be explored by the Tourism Pillar if viable
Value-added agricultural production (Behind the Farm Gate)			North West Motorsport Precinct	To be explored by the Tourism Pillar if viable
Rail access regulatory change / subsidies			Convention centre / five-star accommodation	To be explored by the Tourism Pillar if viable
Replacement of renal unit			Renewal/quality uplift of housing stock	Any investment in housing has demand risk as the population of Mount Isa is uncertain. Further, unlike the executive style housing and lifestyle blocks, this project does not seek to attract people to live in Mount Isa but would improve amenity for existing residents. While it could support a short-term workforce it is unlikely to result in long-term jobs or economic growth.
CopperString - Southern Spur				
CopperString - Northwest Spur				
Evaporation control measures				
Tyre recycling				



3.4 Multi-criteria assessment

An MCA is a structured assessment tool used to refine a list of options by scoring against criteria to rank them based on performance, compared to the current situation. The MCA process ensures that the options are assessed with consideration of all project requirements, objectives and the needs of stakeholder and decision-makers. The outcome of the MCA is a shortlist of projects and initiatives to be included in the Critical Infrastructure Strategy. The MCA design process, as recommended in the IA Guide to Multi-Criteria Assessment, is presented in Figure 12 and further described in the following sections.



Figure 12: MCA design process

3.4.1 Set MCA objectives

The objectives of the MCA are consistent with the objectives of the Critical Infrastructure Strategy, which is to identify projects that:

- Meet the needs of Council and the community
- Drive or support job growth and the transformation of the economy
- Are a mix of small, medium and large scale infrastructure initiatives.

3.4.2 Set criteria, measures and weights

The criteria used to assess the longlist are consistent with the Critical Infrastructure Strategy measures of success and consider the project's potential impact on the problem and its commerciality, these criteria were developed in collaboration with MICC:

- Impact criteria:
 - Strategic alignment - alignment to Council planning and vision, and local competitive advantages
 - Community and social needs - ability to address gaps/community needs, interests and skill sets
 - Jobs - potential to enable direct and indirect job growth and create new and diversified skills pathways
 - Economic outcomes - potential to drive economic development and diversification for Mount Isa
- Commerciality criteria:
 - Deliverability - ease of delivery including timeframe, cost and regulatory pressures
 - Dependencies - risk of delivery in terms of demand, supply, or another project/industry's success

This approach ensures that the shortlisted projects are assessed in terms of their ability to respond to the core purpose of the Strategy and can deliver on the desired outcomes.

Each criterion was also allocated a weighting based on its perceived importance in progressing a project to the shortlist. The following weightings were allocated to the criteria, and agreed to with Council during the MCA workshop:

- **Impact criteria:** 75% allocated equally across the four criteria
- **Commerciality criteria:** 25% allocated equally across the two criteria.

The commerciality criteria were weighted slightly less than the impact criteria as it was considered that these elements of the projects and initiatives (e.g., cost, timeframes, risks, funding) could be managed, mitigated or enhanced to improve commercial outcomes, particularly if the project responds well to the impact criteria.

The criteria, sub-criteria and key considerations/measures and weightings are presented in Table 7.



Table 7: Criteria, sub-criteria and considerations/measures

Type	#	Criteria	Sub-criteria	Considerations / measures
Impact criteria	A	Strategic alignment (19%)	Is the project aligned to Council’s planning and vision for the region?	MICC planning, strategies and policies
			Does the project leverage local competitive advantages?	Minerals, transport and logistics, land/space, country
	B	Community and social needs (19%)	Does the project address a critical need / gap in the community?	Based on engagement with stakeholders
			Does the project align to community interests and skills?	Mining skills, trades, agricultural skills
			Does the project support existing industries?	Mining, cattle farming, transport and logistics
	C	Jobs (19%)	How many direct jobs will the project enable?	Approximate range from no jobs to >100 jobs (see Table 9).
			How many indirect jobs will the project enable?	
			Does the project provide a long-term skills pathway for the region?	New or transferrable skills development such as health, training programs, judiciary
	D	Economic outcomes (19%)	What is the potential magnitude of the direct economic activity generated by the project?	Direct impacts, including downstream supply chain impacts
			What is the potential magnitude of the indirect impacts?	Indirect impacts, such as more time spent in town, more people accessing services and buying goods
Does the project generate social and environmental benefits/disbenefits?			Community pride, health outcomes, social benefits, environmental disbenefits caused during construction or operations).	
Commerciality criteria	E	Deliverability (13%)	How easy is it to acquire the land to deliver the project? (e.g. ownership, size of land etc.)	Brownfield vs greenfield, land ownership, offset/legal requirements, environmental concerns.
			What is the scale of investment required?	Approximate range for no cost to >\$50 million (see Table 9).
			Can the project be delivered in the short-term? (e.g., >3 years)	Approximate range from immediate implementation to >5 years (see Table 9).
			How complex would it be to seek funding?	Council funded, availability of State of Federal funding programs, government priorities, interest from private sector.
	F	Dependencies (13%)	Is this project dependent on another project’s delivery/success?	Enabling infrastructure, supply chain dependent, downstream/upstream infrastructure.



Type	#	Criteria	Sub-criteria	Considerations / measures
			Does the project rely on an existing industry to be viable?	Reliance on mining, transport agriculture etc.
			How risky is the demand/supply for the project?	Reliability and level of demand/supply in region. Demand tied to local residents or copper mining activities.



3.4.3 Define scoring

For each sub-criterion, the options were scored on a five-point scale relative to the current state. Two scoring scales were used, one for each set of criterion types. This approach was implemented to reflect that nature of the impact criteria versus the commerciality criteria:

- The impact criteria focus on the potential positive impacts of the projects, and therefore more positive scores are required to differentiate the options.
- The commerciality criteria consider the complexity of delivery and project risks, and therefore more negative scores are required to differentiate the projects.
- The scoring scales are presented in Table 8. A neutral or insignificant rating compared to the current state is identified in yellow.

Table 8: Scoring mechanism

Score	Description
Impact criteria	
5	Strong positive impact compared to current state
4	Moderate positive impact compared to current state
3	Minor positive impact compared to current state
2	No significant impact to current state
1	Negative impact compared to current state
Commerciality criteria	
5	Positive impact to current state
4	No significant impact to current state
3	Minor negative impact to current state
2	Moderate negative impact to current state
1	Strong negative impact to current state

Scores for the sub-criteria were averaged to determine the overall project score for each criterion. For qualitative criteria, the projects were scored on their perceived relative performance against other options based on discussion at the MCA workshop, with the rationale and drivers for the outcome documented. For the quantitative measures, thresholds were developed to inform the scoring outcomes, as displayed in Table 9.

Table 9: Quantitative thresholds

Sub-criterion	Scale				
	3 1	4 2	5 3	6 4	7 5
2 Impact scoring					
8 Potential estimated jobs (indirect and direct)	9 No jobs	10 < 5 jobs	11 5 to 50 jobs	12 50 to 100 jobs	13 >100 jobs
14 Commerciality scoring	15 1	16 2	17 3	18 4	19 5
20 Approximate scale of investment	21 >\$50 million	22 \$10 million to \$50 million	23 \$1 million to \$10 million	24 <\$1 million	25 No cost



Sub-criterion	1 Scale					
26 Approximate timeframes for delivery	27 >5 years	28 3 to 5 years	29 1 to 3 years	30 <1 year	31 Immediate implementation	

3.4.4 Assessment outcomes

The MCA was conducted on the 27 projects progressed from the rationalisation process (see Table 6). Where possible, benchmarking of potential job, cost and timeframe estimates was used, however, at this stage of the analysis of these initiatives, the MCA was relatively qualitative in nature.

Nevertheless, analysis was informed through researched evidence to the extent possible and outcomes were tested, revised (where relevant), and confirmed during a workshop with Council. This section presents the MCA outcomes from highest scoring to lowest project. The scores presented for each criterion is the average of all the scores received for its sub-criteria. A brief rationale for the outcome is included for each project at the criteria level. For further detail on sub-criteria scoring, please see Appendix C.

Rail access regulatory change / subsidies

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
5.0	4.7	3.7	3.7	4.0	3.0	4.1

Access to rail is critical to a number of industries in Mount Isa. As an economic enabler, the prohibitive cost of rail impacts growth and development for prospective mines, the agricultural industry, construction industry and established mines. This initiative has strong strategic and community alignment to the region, could support a material increase in jobs, and supports broader economic outcomes. While this initiative would have ongoing costs to the State Government in providing the subsidy, it has no upfront capital funding requirement and could be implemented immediately. While the initiative's success relies on existing and emerging industries, it presents no additional cost if these industries do not access the subsidy. Therefore, this initiative was considered to have a positive outcome compared to the current state and has the potential to support sustainable job growth and economic diversification.

North West QLD Correctional Precinct

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.5	3.7	5.0	4.3	1.5	5.0	3.9

This project would create a substantial number of jobs during both construction and operational phases. The North West QLD Correctional Precinct would be one of the most effective projects in ensuring a high volume of stable, high median salaried positions (a large scale correctional centre can create over 1,000 jobs in construction and over 500 jobs during operation based on other Queensland facilities). The correctional precinct would also address social issues present in Mount Isa by offering the opportunity for offenders to rehabilitate on country, and reduce some inefficiencies in current prisoner transport practices. The correctional precinct is not dependent on other industries or projects, and is likely to have a strong demand into the future.

CopperString - Southern Spur

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
5.0	4.3	4.0	3.0	2.5	1.7	3.6

Access to reliable and cheap energy is critical to the construction and successful production of new mining and other resources operations in the region. The southern spur of the CopperString project which is under investigation by Powerlink is enabling infrastructure for projects which will support future jobs and leverage the competitive advantages of the North West including existing resource supply chains and mineral deposits.



Without access to reliable and cheap energy, potential mining and resources operations may wait until renewable energy is delivered to support construction and operations to reduce costs, which may take around 5 to 10 years. Therefore, this project was considered to a moderate to strong positive outcome across the impact criteria. However, this project is dependent on CopperString reaching Mount Isa and would be relatively expensive with the CopperString project costing approximately \$4.5 million per kilometre (based on \$5 billion for 1,100 kilometre project).

CopperString - Northwest Spur (Mount Isa)

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
5.0	4.3	4.0	3.0	2.5	1.7	3.6

Similar to the Southern Spur, this project is enabling infrastructure for infrastructure for projects which will support future jobs and leverage the competitive advantages of the North West. Without access to reliable and cheap energy, potential mining and resources operations may wait until renewable energy is delivered to support construction and operations to reduce costs, which may take around 5 to 10 years. This spur is not currently under investigation by Powerlink and requires advocacy from Council and industry for consideration.

Rehabilitation facility

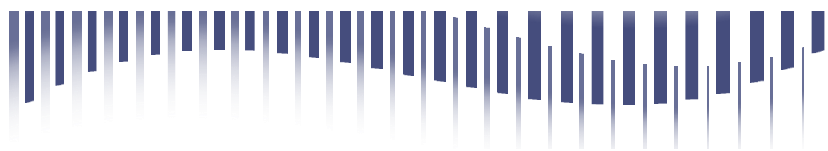
A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.5	4.0	2.7	3.0	3.0	5.0	3.5

This project addresses a clear community need by improving access to rehabilitation and dry-out services, and would deliver a moderate positive impact to the current state. A new facility in the region would mean that North West residents could stay closer to home while accessing care, creating a social benefits and aligning to Council's objectives for a healthy and safe community. A small number of jobs would be created by this project, and it is likely to be run or operated by a not-for-profit. While unlikely to drive direct economic outcomes, this piece of social infrastructure will help people become active members of the community and potentially re-enter the workforce, resulting in a minor positive impact for the economic activity. A rehabilitation centre would likely be run on a not for profit model, with a moderate startup cost (42 bed facility in Rockhampton cost \$16.2 million (2022) including land acquisition and facility design. There are existing models for a facility of this nature both in Mount Isa and across the state, as such implementation would be relatively low complexity. In terms of dependencies, there is demand in the region for the project and it does not rely on another project or industry to be viable, therefore resulting in a strong positive outcome.

Tyre recycling

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
4.0	3.7	3.0	3.7	3.0	2.7	3.4

This project leverages existing industries and supply chains and is strategically aligned to Council's vision for the region therefore scoring moderately positive. A tyre recycling facility for mining trucks, road trains and other large vehicles would create a small number jobs (approximately 30 based on a similar facility delivered by BHP in Bowen Basin) and improve Mount Isa's circular economy while also reducing waste and creating a by-product to be sold or used elsewhere. A similar facility in NSW and Queensland was estimated to cost approximate \$12 million (2019), therefore delivery was considered a minor negative outcome. While the project is dependent on tyre availability, mining, agriculture and transport and logistics are the leading industries in the region and



demand is relatively stable over the medium term. Therefore, this project was considered to have a positive impact compared to the current state.

Public residential aged care capa for high/complex needs (e.g., dementia, disability, mental health)

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.5	3.3	3.7	3.7	1.5	4.3	3.4

Additional complex and high-needs residential aged care capacity has the potential to strengthen Mount Isa’s presence as the health hub of the North West and would improve community connections and overall health, with residents able to stay in region for care. While the project addresses a gap in the region for complex aged care needs, it does not leverage or support existing industries. However, this project would require a strong workforce for Mount Isa and create additional skills pathways. While it represents a challenge from a deliverability perspective requiring a considerable investment (approximately \$250,000 to \$400,000 per bed) and construction timeframe, there appears to be sufficient demand and strong broader economic outcomes associated with the concept.

Mount Isa Rail Line upgrades

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.5	3.3	3.0	3.3	2.8	3.7	3.3

Investigating potential infrastructure upgrades to the North West Rail Line to address climate resilience and improve stacking capacity aligns with the regions existing strengths and comparative advantages, and supports existing industries. However, the project does not address a gap or need in the community and does not support achieving Council’s vision for the region, therefore scoring minor positive on alignment and community outcomes. Given the range of industries that rely on rail in Mount Isa, addressing these problems and opportunities has the potential to generate jobs, and could lower the cost of access to rail therefore resulting in economic activity and delivering a positive outcome. However, there is a moderate cost to deliver the project and it is complex in terms of who would fund it.

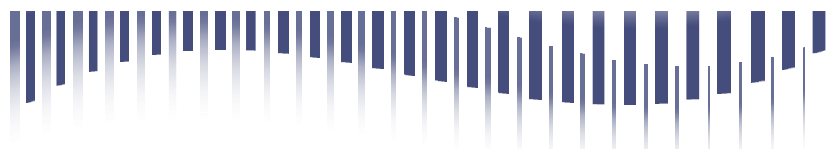
Transport Logistics Centre (TLC) / road transport hub

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
5.0	3.7	2.7	3.7	3.0	1.0	3.3

The TLC (which could include an element of a road transport hub) achieves a strong level of alignment with Council’s objectives due to its ability to support a range of key industries in the region. The TLC has the potential to reduce the cost of rail transport, thereby improving the economics of switching from road to rail for a range of users and potentially supporting mines to become operational with improved access to rail. In turn, this is likely to stimulate the economy in Mount Isa and take trucks off the roads, thereby benefiting the community and achieving broader economic outcomes. The TLC faces some challenges in its delivery relative to other options with the required infrastructure, land and (potential) rail spur. However, the primary challenge with this option is the need for sufficient demand to warrant the facility initially and keep it commercially viable. The TLC likely requires an anchor tenant and a material level of residual demand to avoid ongoing government subsidies. Identifying and securing that demand relies heavily upon commodity prices and as such is the primary risk associated with the facility.

Urgent care/domestic and family violence accommodation

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	3.7	2.3	3.0	3.0	5.0	3.3



Domestic violence is of significant concern in the Mount Isa region, and a prominent issue across Queensland and Australia more broadly. A domestic and family violence refuge accommodation centre would provide a safe place in the community for victims of domestic and family violence, which would provide considerable social benefit to the region and address a clear community gap. While direct job creation would be minimal and the workforce does not overly align to existing interests and skills, the indirect benefits of assisting victims of crime will have positive flow on effects to the local community and economy. Therefore, this project scored minor positive on all impact criteria except jobs. In terms of delivery, the project is expected to have a moderate funding ask, and a facility of this nature would not generate profit, therefore requiring substantial funding intervention to cover capital and operating costs. However, the Queensland Government recently announced a funding boost to domestic, family and sexual violence and this is a policy priority for all levels of government. This project has no dependencies and there is sufficient demand in Mount Isa, scoring positive on this sub-criterion. This project is an important piece of social infrastructure that meets a clear community need and is a current priority for all levels of Government, but is unlikely to deliver job growth or economic diversification.

Common user access road connecting Mount Isa to the Eva Copper Project

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
5.0	3.7	3.0	3.0	2.5	1.3	3.2

This project is enabling infrastructure for two mining projects that are proposed northeast of Mount Isa (Eva and Barbara - depending on the route) which will support future jobs and leverage the competitive advantage of minerals in the region, therefore achieving a strong positive impact on strategic alignment. While not meeting a specific need or gap for the community, its delivery will support projects that are aligned to the existing skills and industries in the region, resulting in indirect jobs and economic activity for Mount Isa. However, as a greater than 95 kilometre, two-lane, sealed road, its delivery would be complex and come at a high cost, with the Bureau of Infrastructure and Transport Research Economics (BITRE) estimating a regional road construction cost of \$5 million per lane kilometre (2017). Its use and viability are also dependent on the two mines progressing to operations, therefore creating a level of commercial risk. As such, it will have a moderate and strong negative impact in terms of the commerciality requirements.

Helicopter flying school / training facility

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.5	3.7	2.3	2.7	3.5	3.7	3.2

This project was considered strategically aligned to community interests and skills. A flying school builds the region’s pathway for pilots and a heli-mustering focussed facility would leverage the existing agriculture industry and mustering capabilities. This project also addresses a gap in the community, with people currently travelling outside of Mount Isa to complete training. As such, the project is expected to have a minor positive impact in terms of strategic alignment and community needs. However, very few people would be required to run a facility of this nature, and therefore it would be unlikely to create many new jobs compared to the current state. This project could be delivered immediately and is not overly complex or expensive. The project does rely on heli-mustering and agricultural industries to be successful, however, there is limited associated demand risk.

Cave Hill Dam

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	3.7	3.0	4.0	1.8	3.0	3.2

Similar to the pipeline, this project leverages local competitive advantages and supports existing industries including agriculture and mining. Previous studies by MITEZ also estimate the project will deliver 400 jobs in construction, two direct jobs during operations and 58 indirect jobs during operation. The dam is also expected to generate \$264 million per annum in regional economic benefit by supporting key industries in the region,



resulting in a moderate positive outcome for this criterion. However, the current economic analysis estimates the project to cost \$459 million, scoring a strong negative on the deliverability criterion. Despite considerable cost and complexity to deliver, the potential positive economic outcomes have resulted in this project achieving a minor positive impact compared to the current state.

Evaporation control measures

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	3.7	2.3	2.7	4.3	3.3	3.1

Water underpins a range of industries, planning activities and projects in Mount Isa and evaporation is major issue impacting water supply the region. Addressing this issue would support existing industries by improving access to and reliability of water. While relatively simple to deliver, the project is unlikely to create ongoing jobs and may only result in minimal indirect economic outcomes. As a critical resource for several industries, this project is considered enabling infrastructure and would have a positive impact to the current state.

Lifestyle blocks

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	3.3	2.3	2.7	4.5	3.3	3.1

This project aligns to Council's vision for the region and leans into the natural advantage of Mount Isa where space is abundant and a more regional lifestyle is promoted, therefore resulting in a minor positive impact. However, residential development projects will only contribute a limited number of construction jobs in the short-term. In the long-term the project should be considered an enabling factor for industries looking to attract and retain staff in the area. While easy to deliver, lifestyle blocks are reliant on demand which is currently uncertain. Furthermore, increasing housing supply in the region has the potential to reduce prices for local homeowners, particularly if demand decreases as people leave the region following the mine closure. Overall, this project was considered to not deliver the jobs and economic activity the region is seeking.

Airforce/military facility

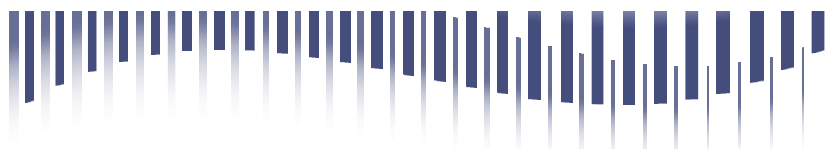
A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.5	3.0	3.0	3.0	2.3	3.7	3.1

This project leverages the competitive advantages of the region in terms of space, privacy, and proximity to the Gulf of Carpentaria. While not addressing a gap in the region, the project could support the Defence industry and build on the existing capability in Mount Isa. It could also bring stable jobs to the region that would in-turn create economic activity and upstream and downstream supply chain benefits. As such, the project was considered to have a minor positive outcome for all impact criteria. However, Mount Isa is not identified as a current or future priority in the refreshed Defence strategy and therefore this project is unlikely to be approved to proceed.

Executive style housing

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	3.3	2.3	2.7	4.3	3.0	3.0

The introduction of executive style housing in Mount Isa is appropriate given the senior executive positions (predominantly in the mining sector) that are attracted to the regions. MICC has identified the potential to encourage / retain high salaried individuals in the community through expanding executive style housing. This project leverages existing capabilities and strengths and meets a gap in the community, therefore scoring minor positive. However, it is unlikely to drive any job or economic outcomes. The project is dependent on senior executives working in and choosing to move to Mount Isa, therefore scoring negative on dependencies.



Furthermore, increasing housing supply in the region has the potential to reduce prices for local homeowners, particularly if demand decreases as people leave the region following the mine closure. Overall, this project was considered to not deliver the jobs and economic activity the region is seeking.

Duplicate North West Pipeline and Cloncurry Pipeline

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	3.7	2.3	3.7	1.8	2.7	2.5

Water underpins a range of industries, planning activities and projects in Mount Isa, therefore this project leverages local competitive advantages and scored minor positive on the strategic alignment and community interests’ criteria. However, the pipeline itself is unlikely to deliver any direct ongoing jobs but may create indirect jobs through supporting existing industries. From a commerciality perspective, the pipeline would be complex to deliver and come at a high cost. Investment in water infrastructure is also dependent on strong agricultural and mining production, therefore this project was considered to have no significant impact compared to the current state when balancing the impact and commerciality criteria.

Road network specifications for mine access

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
4.0	4.3	2.0	2.7	2.3	1.7	2.9

This initiative delivers on Council’s planning objectives to create a safe and healthy community. It also supports the safe and efficient operations of two existing industries (mining and transport and logistics) therefore scoring moderate positive on the strategic alignment and community needs criteria. However, this initiative is unlikely to deliver many direct or indirect jobs, except for those during construction. It is also not expected to generate much economic activity above the current state; however, it will deliver strong social benefits and environmental benefits through safety outcomes and less degradation of the land on unsealed roads. In terms of delivery, the initiative would be expensive (based on the BITRE (2017) \$5 million per lane kilometre cost), and it is unclear who would wear the cost of delivery (e.g., the Queensland Government, Local Governments or the mines), making it extremely challenging to progress. This initiative is also dependent on the future of the mining industry and therefore scored low on dependencies.

Replacement of renal unit

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
2.5	2.7	2.3	3.0	2.8	4.3	2.9

This project addresses a gap in the region for renal dialysis and would improve community health and wellbeing by reducing the number of people travelling to Townsville for care. Expanding Mount Isa’s capacity as a more comprehensive health hub for the North West may also generate a small level of economic activity as people visit the City for care. However, the project is not expected to create many direct or indirect jobs and would likely be moderately complex and costly to deliver (approximately \$15 million based on recent Australian Government funding for similar projects in regional Australia). However, there is clear demand for renal dialysis in the region, therefore while the project was considered to be little to no impact compared to the current state in terms of job creation and economic diversification, it would drive community benefits and is an important piece of social infrastructure.

Liveability - Precincts and attraction

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	2.7	2.3	2.7	2.5	4.3	2.8

This initiative aligns with Council’s vision for the region and would provide some benefits to the community by increasing liveability and amenity, as well as serving as an improved tourist experience. This initiative would



have a minor to moderate effect on attracting / retaining residents and visitors, with a flow on effect to the local economy. Dependant on the scale of the projects within the initiative, liveability precincts and attractions could pose moderate complexity in land acquisition, due to a preference for inner city space.

Public transport provision

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	3.0	2.0	2.7	3.0	3.7	2.8

This project was considered to be strategically aligned to Council’s planning and vision for the region in terms of establishing safe and healthy communities, innovative and efficient infrastructure networks and providing a healthy environment. It also addresses a clear community infrastructure gap and service need. Public transport would provide social and community benefits, particularly for those who do not have a car and cannot access services, work, or education as it is too hot to walk. However, public transport does not leverage local competitive advantages and will not support a high number of jobs or drive economic outcomes. Safety is also a consideration, with local taxis reporting challenges with operating at night due to vandalism or fares not being paid, raising questions about the potential operating hours of a public transport alternative. Therefore, this project was considered to have a minor positive impact for strategic alignment and community needs, and limited impact to the current state for jobs and the economy. While it is considered relatively easy to deliver, there is an element of demand risk associated with this project, particularly if people leave the region because of the mine closure.

Administrative government workforce consolidation / call centre

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
2.5	2.0	2.7	2.3	4.3	4.0	2.5

This project would provide immediate jobs to the region and may support Council's vision to diversify the workforce. While it does not leverage the skills of the current workforce or support local industries, it could attract more people working in government for the North West region to live in Mount Isa or more existing residents to apply for administrative/call centre jobs. It could also use existing infrastructure in town to reduce upfront capital costs, scoring well on the commerciality criteria. Given the project is unlikely to drive economic outcomes for the region, it was considered to have little to no impact compared to the current state. However, this project could support residents to stay in Mount Isa while other projects progressed and could be delivered in the short-term with only a small start-up cost.

Aircraft apron

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
3.0	2.3	2.0	3.0	3.0	3.7	2.8

Additional aircraft apron capacity at the Mount Isa airport will support the tourism and mining industries, achieving a minor positive impact score. However, it does not address a community need or gap. The project will have limited impact compared to the current state in terms of direct and indirect jobs. Increasing capacity and allowing additional aircraft to land at Mount Isa airport does have the potential to create minor positive economic outcomes for the region. The project would be relatively easy to deliver at a relatively minor cost. The project does not rely on another project’s delivery, however, does require demand to remain consistent to be necessary/viable.

Value-added Agricultural Production (Behind the Farm Gate)

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
2.5	2.3	2.7	2.7	2.8	3.7	2.7



This project would create a downstream agricultural production industry in the region and has the potential to create a small number of direct jobs. While leveraging local competitive advantages of agricultural production, the project does not address a community need and is unlikely to generate strong economic outcomes. In terms of impact criteria, this project is considered to have no significant impact compared to the current state. Furthermore, the facility is expected to be moderately complex and costly to deliver and relies on other industries to be successful. At this stage on analysis the project was considered to have limited impact compared to the current state, but further investigation by the agriculture pillar or MITEZ could be warranted to explore diversification.

Recreational infrastructure at Lake Moondarra

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
2.5	2.3	2.3	2.3	2.8	4.7	2.7

While this project would support the community and existing tourism industry in Mount Isa and serve as a means of attracting / retaining people to the region, it is unlikely to drive much impact compared to the current state. The different components of this project including the camping facilities, fishing pontoon walking trails etc. would be moderately complex and cost intensive to construct and maintain, therefore this project scored low on the deliverability sub-criterion. However, it has no dependencies and would support the existing community but does not meet the objectives of the Strategy.

Mixed use build in CBD

A: Strategic alignment	B: Community and social needs	C: Jobs	D: Economic outcomes	E: Deliverability	F: Dependencies	Weighted score
2.5	2.7	2.7	2.0	2.5	3.0	2.5

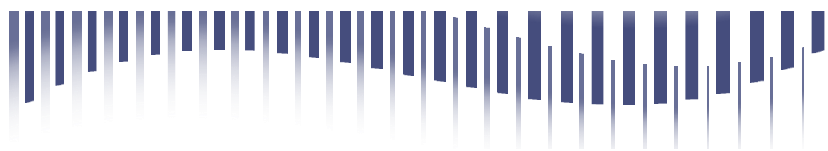
This project supports Council’s aims of revitalising the town centre, however, a mixed use building of this nature would be a relatively new concept for Mount Isa. Furthermore, due to a number of vacant shop fronts in the town centre and unconfirmed demand for inner-city living, there is a risk that a mixed use building in the CBD would be underutilised. Alignment with future public sector accommodation needs would help mitigate this risk. However, there are specific services/elements that could be delivered in this project that would address community needs and enable jobs, such as childcare, allied health, or a government department call centre. Further investigation in this option is warranted to ensure any future tenancies are aligned to the community and commercially viable.

3.4.5 Ranked MCA outcomes

The ranked outcomes of the MCA are presented in Table 10.

Table 10: Ranked MCA outcomes

Rank	Project	Overall score
1	Rail access regulatory change / subsidies	4.1
2	North West QLD Correctional Precinct	3.9
3	CopperString - Southern Spur (under investigation by PowerLink)	3.6
4	CopperString - Northwest Spur (Mount Isa)	3.6
5	Rehabilitation facility	3.5
6	Tyre recycling facility	3.4
7	Public residential aged care capacity for high and complex needs	3.4
8	Mount Isa Line upgrades	3.3
9	Transport Logistics Centre (TLC) and road transport hub	3.3
10	Urgent care/domestic violence accommodation	3.3
11	Common user access road between Mount Isa and Eva Copper Project	3.2



Rank	Project	Overall score
12	Helicopter flying school / training facility	3.2
13	Cave Hill Dam	3.2
14	Evaporation control measures	3.1
15	Lifestyle blocks	3.1
16	Airforce/military facility	3.1
17	Executive style housing	3.0
18	Duplicate North West Pipeline and Cloncurry Pipeline	2.9
19	Road network specifications for mine access	2.9
20	Replacement of renal unit	2.9
21	Liveability - Precincts and attraction	2.9
22	Public transport provision	2.8
23	Administrative government workforce consolidation / call centre	2.8
24	Aircraft apron	2.8
25	Value-added agricultural production (Behind the Farm Gate)	2.7
26	Recreational infrastructure at Lake Moondarra	2.7
27	Mixed use build in CBD	2.5

3.5 Shortlist

Based on the outcomes of the MCA, it was agreed with Council that the top 10 projects progress to the shortlist for further development and investigation. A summary of the shortlisted projects, their infrastructure types and sectors are presented in Figure 13.

Core infrastructure projects	Critical infrastructure projects	Catalytic infrastructure projects
Transport <ul style="list-style-type: none"> Mount Isa Line upgrades 	Transport <ul style="list-style-type: none"> Rail access regulatory change / subsidies Tyre recycling facility Health <ul style="list-style-type: none"> Urgent care/domestic violence accommodation Public residential aged care capacity for high and complex needs New rehabilitation centre 	Transport <ul style="list-style-type: none"> Transport and Logistics Centre and road transport hub Energy <ul style="list-style-type: none"> CopperString - Southern Spur CopperString - Northern Spur (Mount Isa) Judicial <ul style="list-style-type: none"> North West QLD Correctional Precinct

Figure 13: Shortlist infrastructure types and sectors

This outcome aligns to the objectives of the Strategy, with a mix of small, medium and large-scale projects that meet the needs of the community and have the potential to drive economic transformation. Importantly, the majority of shortlisted projects fall under the critical and catalytic infrastructure category types, which are able to deliver jobs and sustain economic activity.

Supporting these hard infrastructure initiatives are the smaller-scale or more community aligned enabling and social infrastructure projects which are unlikely to result in significant economic diversification but important for the region, its community, and its key industries.

The shortlisted projects are further developed and investigated in Chapter 4, including case studies of Australian or international examples, more detailed benchmarking of costs and potential job and economic impact, and status along the project lifecycle (i.e., from feasibility through to funding and delivery).



During the MCA workshop and options analysis process, several projects from the longlist were identified for further consideration:

- **Pyrite furnace / sulfuric acid plant:** DSDI is currently undertaking an investigation into the sulfuric acid supply chain in the region. This project will be critical if the Glencore copper smelter closes and is therefore a priority initiative. However, this project falls under the resources pillar and it is understood that further investigation will be progressed once the outcomes of the DSDI analysis are finalised.
- **Public transport provision:** This project has been identified as a priority initiative for the region as there is a clear gap in the transport network which is impacting the ability of residents to access work, education, services and activities. Community has been vocal about the need for a public transport service, with local taxis the only alternative, particularly when it is too hot, or the weather does not permit walking. It is recommended that this project be included in the short-term delivery category and further explored by Council and TMR.
- **Helicopter / Heli mustering flying school:** While only a small direct impact on jobs, a heli-mustering school is strategically aligned to the local agricultural industry and could establish Mount Isa as a national provider of this service. This initiative would require minimal upfront investment relative to other options and should therefore be included in the short-term delivery category, for Council to discuss with potential proponents in the next phase of the Transformation of Economy Strategy.
- **Mixed-use CBD building:** Further definition of this option is required, however there may be a strong rationale for a higher-quality mixed use building in the CBD that caters to apartment living, office space, other commercial uses such as childcare or allied health, and/or shopfronts. As with any housing initiatives, increasing supply of housing in response to the impending changes to Glencore's operations should be handled carefully and as such the report will clearly identify the risks associated with this option.
- **Administrative hub / call centre:** It is recommended that this option should be further refined to focus on the potential to 'fill the gap' in employment that is associated with the mine closure before other projects in the Transformation of Economy Strategy can progress to delivery and operations. This project has a low barrier to entry and minor upfront funding requirements. As an integrated public sector administrative hub for the North West, this project could also prioritise the employment of locals into government administration roles. Potential call centre clients should be explored by Council, such as Government departments or Government Owned Corporations located in the region.
- **Water planning:** The Queensland Government is currently undertaking a detailed review of the Gulf Water Plan. Until the outcomes of this review are known, the Critical Infrastructure pillar has not shortlisted any water projects. However, access to reliable and affordable water is critical to several of the region's key industries. Therefore, the outcomes and recommendations from the review should be progressed as priority to enable Mount Isa's economic diversification and industry development.
- **Housing:** Housing quality and diversity was raised several times during stakeholder consultations which resulted in the inclusion of three housing options in the longlist: Executive style housing to attract more mining executives to live in the region, lifestyle blocks to attract people looking for outback living while being proximate to the city, and a housing renewal program that initially focusses on social housing quality uplift. However, any investment in housing under the current circumstances holds some demand risk given the population of Mount Isa is uncertain. While none of the housing projects progressed to the shortlist for this reason, improving housing in the region is of clear interest. Therefore, a small program of works to improve the quality of social housing could be progressed in the short-term to provide a casual workforce during the region's transition and improve community amenity. Investigation of the viability of a private housing renewal grant program, executive style housing and additional lifestyle blocks could be conducted in the medium term, once the population of Mount Isa is more certain.



4. Shortlisted Projects - Pathways to delivery

This chapter presents the desktop investigation of the projects and initiatives shortlisted in Chapter 3. Each section provides an overview of the potential impact and commerciality of the project, including case studies and evidence to support findings. The status of the project is also identified in terms of where it sits in the project lifecycle (Figure 14). Further detail on next steps based on the project’s status is included in Chapter 5.

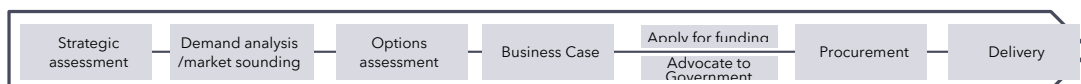


Figure 14: Project lifecycle stages

4.1 Rail access regulatory change / subsidies

Project description: Regulatory reform for the Mount Isa Line to help increase access to, and affordability of, rail for local industry participants. This could involve a subsidy or incentive scheme for new or emerging operations in the region

Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
5.0	4.7	3.7	3.7	4.0	3.0	4.1

Headline impact outcomes: Benefits to several proposed mining operations in the region that will support a considerable number of future jobs, including the Eva Copper Project (total 1,200 jobs) and Paradise South Stage 1 (400 jobs).

Headline commerciality outcomes: Less complex to implement than other shortlisted infrastructure, however, likely to have a high cost to government depending on demand and length of reform/subsidy.

4.1.1 Description

This initiative involves undertaking rail access regulatory reform and/or implementing a subsidy to decrease the cost of rail freight on the Mount Isa Line to encourage a mode shift away from road-based transport and improve the viability of various projects in the region. The Mount Isa Line is Queensland Rail’s only system that is purely commercial, receiving no funding from the Queensland Government Transport Services Contract subsidies for below-rail services.⁹ As a result, access is costly, with Aurizon reporting that access charges for containerised minerals are around two to three times higher than other comparable corridors.¹⁰ Stakeholders interviewed reported that cost is considered a barrier to using rail as a mode of transporting freight by many emerging industries and junior mines in the region. High rail access costs and take or pay contracts are particularly challenging for new mining and minerals operations at the early stages of production.

Case study: In 2019, the Queensland Government funded a subsidy for the Mount Isa Line to address this barrier and boost freight and exports for the North West Minerals Province. The Mount Isa Line Incentive Scheme involved \$20 million in annual funding over four years for commercial freight users on the Mount Isa Line. Eligible customers included existing mining operators, and new freight, including mining and intermodal services.¹¹ Customers that were not eligible under the scheme include livestock, passenger trains and non-revenue movements. The incentive scheme was provided to eligible users based on the percentage

⁹ QCA. (2018). Queensland Rail Declaration Review. https://www.qca.org.au/wp-content/uploads/2019/05/34432_Draft-recommendation-Part-B-Queensland-Rail-2.pdf

¹⁰ Aurizon. (2023). Queensland Rail 2025 Draft Access Undertaking Submission to QCA. <https://www.qca.org.au/wp-content/uploads/2022/10/aurizon-coal-bulk-sub-q-2025-dau-feb-2024-redacted.pdf>

¹¹ TMR. (2023). Mount Isa Line Incentive Scheme. <https://www.tmr.qld.gov.au/business-industry/transport-sectors/freight/mount-isa-line-incentive-scheme>



of gross tonnes per kilometre (GTK) from rail freight services as a proportion of total freight GTKs moved on the Mount isa Line.¹² The outcomes of the Mount Isa Line Incentive Scheme have not been published.

A new program could have a broader eligibility than the previous Mount Isa Line Incentive Scheme to support more diversified use of the line in the region, or alternative scheme design, such as: a direct percentage subsidy to operators; a rail haulage charge deferment scheme; or a rebate/ cash-back initiative on operator costs.

Such as scheme should take account of different industry dynamics and opportunities for growth. For example a siding extension was recently completed at Maxwellton (October 2023) on the line to allow for more livestock to be transported by rail,¹³ and that a single cattle train can transport approximately 966 head of cattle, which is equivalent to 13 B-doubles or 20 semi-trailers.¹⁴

Further service enhancement initiatives and regulatory reform should also be considered to improve efficiency and competitiveness, and to remove barriers to new market entrants. This could include coordinating and combining smaller freight movements to reduce costs and increase utilisation of the rail line. Examples include the Aurizon MILI Freighter solution¹⁵ or the Queensland Government led six-month trial in 2021 of a freight coordinator service for the Mount Isa Line.¹⁶ Another reform option proposed to the Queensland Competition Authority (QCA) in the public submission component of its 2025 Draft Access Undertaking is price differentiation of access between users based on freight and end use. In its submission to QCA, North West Phosphate suggests that *“differentiating between mining outputs, and attributing lower access prices to products sold in global markets with lower margins, would provide an economic incentive to junior mine development.”*¹⁷

Prior to progressing with the rail access regulatory change / subsidy initiative and any of the proposals identified above, it would be beneficial for Council to engage with TMR to assess the success and/or limitations of the previous scheme, particularly in terms of:

- Uptake and total spend, including proponents and key industries
- Local industry activity as a result of the incentive scheme (i.e., impact on new operations or junior miners’ business decisions)
- Capacity of rail infrastructure and interaction with above rail operators
- Limitations and opportunities associated with previous subsidy
- Precedent analysis completed on other forms of subsidies or general market demand and interest.

4.1.2 Impact

The potential impact of this initiative can be considered through its ability to create jobs and drive economic activity by leveraging local competitive advantages and supporting existing and emerging industries to flourish.

Strategic alignment

This initiative supports the region’s competitive advantages by reducing the cost of transport for new and emerging mining operations (or other industries) where economies of scale have not yet been established to warrant investing in rail freight. Road freight is increasingly being preferred by smaller miners who have variable volume and whose product may need to be trucked a significant distance to a rail load point. However, bulk transport by rail remains substantially more cost effective than road.¹⁸ Any regulatory reform to improve access

¹² Queensland Government. (2019). Mount Isa Line Incentive Scheme Guidelines. <file:///C:/Users/nwilton001/Downloads/mount-isa-line-incentive-scheme-guidelines.pdf>

¹³ Queensland Cabinet. (2023). More cattle on the “moove” after major upgrade to Mount Isa rail line. <https://statements.qld.gov.au/statements/98899>

¹⁴ TMR. (2022) Cattle Rail Transport. <https://www.tmr.qld.gov.au/business-industry/transport-sectors/freight/cattle-rail-transport>

¹⁵ Aurizon. (2022). Mount Isa Line Integrated Freighter. <https://www.aurizon.com.au/what-we-do/bulk/bulk-queensland/mili-freighter>

¹⁶ Queensland Cabinet. (2021). Logistics trial to reduce freight costs in north-west Queensland. <https://statements.qld.gov.au/statements/94008>

¹⁷ North West Phosphate. (2024). North West Phosphate submission to the Queensland Competition Authority on Queensland Rail’s 2025 Draft Access Undertaking. <https://www.qca.org.au/wp-content/uploads/2022/10/nw-phos-sub-qr-2025-dau-feb-2024.pdf>

¹⁸ Australian Railway Association. (2023). The future of freight. <https://www.railskillshub.gov.au/sites/default/files/2024-01/The%20Future%20of%20Freight%20-%20ACRI.pdf>



to rail and increase operational efficiencies must be designed to drive positive economic outcomes for the region. Some proposed mines in the North West Minerals Province which may benefit from this initiative include:

- Eva Copper Project, Harmony Gold
- The Cloncurry Project, True North Copper
- Paradise South, North West Phosphate
- Ardmore Phosphate Project, Centrex
- Barbara Mine, Aeris Resources
- Mount Isa Inlier Copper and Gold Projects, Carnaby Resources
- Richmond - Julia Creek Vanadium Project, Richmond Vanadium Technology.

Economic outcomes

Reducing the cost of rail freight has the potential to significantly influence the economic viability of potential projects and emerging industries in the region, and therefore Mount Isa's economic development. Reducing transport costs for existing and prospective operators in the region is likely to improve their commerciality and provide greater certainty as they reach final investment decision.

The indirect economic benefit of the rail access regulatory reform / subsidy initiative is critical to Mount Isa's transformation, with its key competitive advantage being that it is located in the North West Minerals Province. Diversified mining operations in the region will strengthen the economy's resilience to shocks, such as commodity pricing fluctuations, reducing mineral deposit quality, and severe weather events.

Economic outcomes directly associated with this initiative include the avoided externality costs and social benefits of using rail freight over road-based transport, including:

- Avoided environmental externalities: Greenhouse gas emissions (GHG), air pollution, noise pollution, water pollution, and nature and landscape impacts. Rail freight is estimated to produce 16 times less carbon emissions than road freight per tonne-kilometre travelled.¹⁹
- Avoided safety incident costs: Rail transport has much lower crash rates and related costs than road transport. This results in potential benefits when freight shifts from road to rail. Safety is a key concern on the road network in the region, with 128 crashes on the Barkly and Flinders Highway that resulted in hospitalisation or fatality in the five-year period between 2017 and 2021.²⁰

Jobs

While the rail access regulatory reform / subsidy initiative is unlikely to create any local direct jobs for the region (unless it creates an increase in services and therefore operational staff), the indirect jobs associated with the delivery and operations of the proposed mines in the region are substantial, for example:²¹

- Stage 1 Paradise South:
 - Construction: 250-300 jobs
 - Operations 120-150 jobs
- Eva Copper Project:
 - Construction: 850 jobs
 - Operations: 350-400 jobs.

¹⁹ Aurizon. (2022). Presentation to MITEZ.

²⁰ Ibid.

²¹ DSDI. (2024). Projects Pipeline - North West Minerals Province. <https://www.statedevelopment.qld.gov.au/regions/regional-priorities/a-strong-and-prosperous-north-west-queensland/projects-pipeline-north-west-minerals-province>



Just these two projects alone have the potential to support a considerable number of the expected jobs lost from the closure of Glencore’s copper mining operations. Therefore, any initiative that supports the successful delivery and operations of these mining projects should be progressed with priority.

4.1.3 Commerciality

Deliverability

Based on the previous Mount Isa Line Incentive Scheme and the current cost of access, the expected cost to deliver the rail access regulatory reform / subsidy initiative is likely to be high. The previous scheme cost the Queensland Government \$80 million over a four-year period. Further investigations would be required to confirm the viability of regulatory reform or a subsidy, and identify a funding source. Such as measure could be partially funded by future benefits to the budget from increased production and exports.

Dependencies

This initiative has minimal dependencies, noting however that the regulatory environment for rail access is determined by the Queensland Competition Authority. An incentive scheme would likely be tied to an application and eligibility process, meaning that it would only require cost to government if there was demand. Furthermore, rail freight supports several of the pillars of the economic base of Mount Isa, including resources, energy, and agriculture. Consequently, transport is likely to continue to be a key economic enabler for the region over the long-term.

4.2 North West Queensland Correctional Precinct

Project description: The North West Queensland Correctional Precinct opportunity represents a broad proposal for correctional infrastructure in the Mount Isa region. The primary considerations for a correctional precinct in the region would be whether to service youth or adult offenders, and whether the facility would be targeted at high or low security inmates.

Summary impact outcomes: A locally based correctional precinct presents an opportunity to address statewide demand for prison capacity and house inmates closer to their homes and existing support networks.

Summary commerciality outcomes: The North West Queensland Correctional Precinct has the ability to create a strong, stable jobs pipeline for the Mount Isa region with a high end estimate of up to 1,700 construction jobs and up to 800 operational jobs, depending on the size and nature of the facility.

Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
3.5	3.7	5.0	4.3	1.5	5.0	3.9

```

graph LR
    A[Strategic assessment] --> B[Demand analysis / market sounding]
    B --> C[Options assessment]
    C --> D[Business Case]
    D --> E[Apply for funding / Advocate to Government]
    E --> F[Procurement]
    F --> G[Delivery]
    
```

4.2.1 Description

The Northwest Queensland Correctional Precinct opportunity represents a broad proposal for correctional infrastructure in the Mount Isa region. This precinct could take a number of forms, depending predominantly on the needs of the State Government’s correctional system, and the type of facility which would be accepted by stakeholders in the region. The primary considerations for a correctional precinct in the region would be whether to service youth or adult offenders, and whether the facility would be targeted at high, or low security inmates. There are several case studies across the state in existing correctional centres that can be used to evaluate the potential impact of constructing a correctional facility in the region, however the common thread through all categories of correctional infrastructure is strong job creation, both in the construction and operational phases of the facility.



At this point in project investigations, it is not necessary to commit to one model for the correctional precinct, as demand and public perceptions for a facility of this nature will likely be subject to change throughout the course of the project's inception lifecycle.

4.2.2 Impact

The key strengths of this proposal, with respect to the impact criteria outlined in section 3.4.2, are in the correctional precincts ability to address community and social needs, as well as create a number of high value, stable jobs in the region.

Community & social needs and strategic alignment

Throughout the course of this project stakeholder consultation work has been completed to identify that Mount Isa, and the surrounding region, are experiencing several social issues which are of increasing concern for local residents. In general, stakeholders have identified that domestic violence, youth crime, property crime and substance use are all present in the region, with an increasing sentiment that more should be done to protect the social cohesion of Mount Isa. To support these insights that were obtained more generally from stakeholders across a variety of industries, specialist consultation was conducted in the criminal justice sector, with local representatives from the Queensland Police Service (QPS), Queensland Corrective Services (QCS) and Mount Isa City Council.

Stakeholder consultation identified a number of inefficiencies from both a cost and outcomes standpoint in current prisoner incarceration and transport operations.

- **QPS Watchhouse** - The first location for local offenders facing a term of imprisonment is often the Mount Isa watchhouse, administrated by QPS. The watchhouse regularly exceeds its capacity of 30 detainees, which is of significant concern to the local QPS, and has also been identified by both the QPS Union and Amnesty International, due to the possible human rights concerns of overcrowding in this facility.
- **QCS Correctional Centres** - In addition to the QCS watchhouse, individuals either awaiting sentencing, or sentenced to a term of imprisonment can be incarcerated in a correctional centre. The closest correctional centres to Mount Isa are the Townsville Correctional Centre, and the Capricornia Correctional Centre north of Rockhampton. Transporting prisoners to these centres is a costly, and risky endeavour. Mount Isa QPS outlined that approximately \$3 million in overtime allowances are paid to staff each year for prisoner transport duties, leading to both budgetary overrun and staff burnout. Mount Isa Community Corrections (QCS) also outlined that there are significant operational risks associated with prison releases from Townsville and Rockhampton. Prisoners are required to undertake long journey's using multiple means of transportation, which can be logistically challenging for individuals who often exhibit low life skills. This transport period can result in offenders subject to community supervision failing to meet their requirements to QCS, and an inability to manage their risk to the community.

A locally based correctional precinct presents an opportunity to solve these budgetary and operational risk concerns by housing inmates close to their homes and existing support networks. This is a particularly important concept for First Nations peoples who hold land and connection to country in great significance, with fundamental ties to their identity.²² There is evidence to suggest that on-country rehabilitation programs can be an effective tool in reducing recidivism among First Nations individuals,²³ further supporting the case for a local solution for incarcerated offenders.

Jobs and economic outcomes

Another contributing factor to the strong multi-criteria scoring of the North West QLD Correctional Precinct was the ability to create a strong, stable jobs pipeline for the Mount Isa region. As stated in the description, this

²² Welcome to Country - Connection to Country - <https://experience.welcometocountry.com/blogs/learning/connection-to-country>

²³ ABC News - Queensland government extends cultural program to rehabilitate serious repeat offenders - <https://www.abc.net.au/news/2024-02-21/relocation-sentencing-youth-detention-crime-queensland/103488764>



opportunity has the potential for a large degree of scalability, from a large scale, high security correctional facility, to a smaller low security facility with a greater focus on a community engagement model.²⁴



Figure 15: Lockyer Valley Correctional Centre

Case study: The most recently constructed correctional centre in Queensland is the Lockyer Valley Correctional Centre (LVCC) (see Figure 15) which is an expansion to an existing site in Gatton. This facility is slated to be one of the largest in Queensland, accommodating over 1,500 beds. For a facility of this size, the job creation opportunities are substantial. Over 1,700 jobs were created in the construction of the facility,²⁵ which commenced in 2021 and is now poised to commence operations. In addition to these construction jobs, over 800 employees are required to operate the facility, including custodial correctional officers, psychologists, educators, administration staff, occupational therapists, trade instructors and social workers. Salaries for custodial correctional officers range from \$81,645 to \$117,152,²⁶ which is substantial above the national median salary of \$67,600 as at August 2023.²⁷

While LVCC is a large-scale high security centre, and therefore has high labour requirements, even a smaller scaled facility will result in significant job opportunities for the region. This is as a result of the strict security and personnel requirements for a correctional centre, as well as allowing for a rehabilitative focus with a number of additional education, health and social work based positions.

4.2.3 Commerciality

The commercial implications of the correctional precinct proposal are mixed, as outlined in section 3.4.2, with the positive of low dependency on other projects / industries, but with the complexity of a high cost, and relatively long timeframe for delivery.

Deliverability

Delivering a correctional precinct of any scale is likely to be a complex process, with significant cost involved due to the strict infrastructure requirements, and political implications surrounding the criminal justice sector. Benchmarking again based on LVCC (a large scale, high security, adult correctional centre) as the most contemporary example of prison construction in Queensland, the total expenditure for this facility as of April

²⁴ Queensland Corrective Services - Low security and its role in community safety - <https://corrections.qld.gov.au/low-security-and-its-role-in-community-safety/>

²⁵ River949 - New men's high security prison in Lockyer Valley to be largest in state - <https://www.river949.com.au/local-news/new-mens-high-security-prison-in-lockyer-valley-to-be-largest-in-state/>

²⁶ Courier Mail - Gatton prison jobs: 800 positions need to be filled at new correctional facility - <https://www.couriermail.com.au/news/queensland/gatton/gatton-prison-jobs-800-positions-need-to-be-filled-at-new-correctional-facility/news-story/7bf970ec2dfa33f729a2aaf0d971cd0b>

²⁷ ABS - Employee Earnings - <https://www.abs.gov.au/statistics/labour/earnings-and-working-conditions/employee-earnings/aug-2023>



2024 was \$885 million.²⁸ The construction of this facility occurred over 3 years, however it is noted that an existing site had planned and established for this facility prior to construction commencing. It is further noted that while construction is considered complete on this facility, it is yet to be operationalised as of May 2024.

Naturally, this significant public investment must be justified by demand for expansion in correctional facilities and could be subject to public and political scrutiny. In their 2022-23 annual report, QCS outlined that the built cell capacity across Queensland is 130.7%,²⁹ indicative of significant capacity issues across the adult system. The Australian Human Rights Commission has identified that prisoners are particularly vulnerable to human rights abuses, and lists overcrowding and sharing cells as potential risks for human rights abuse.³⁰ As it relates to the proposed North West Queensland Correctional Precinct, while complexity and public scrutiny are understandably high, there is clear justification for further development within the system’s capacity constraints, and the significant implications these factors have on the human rights of prisoners in Queensland.

Dependencies

A key strength of the proposal for a new correctional precinct is a lack of dependency on other industries or prospective projects. Acknowledging the context of the Mount Isa Economic Transformation Strategy with Glencore’s closure and a decrease in activity for the resources sector, diversifying into an opportunity with stable demand could be of significant benefit to the Mount Isa region.

Stakeholder consultation identified that QCS supervise approximately 600 offenders out of the Mount Isa District Office, incorporating Mount Isa City and the broader region. QPS crime statistics show a sharp rise in all offences for the policing region, with total offences rising approximately 49% to 13,551 from 2020 to 2023.³¹ During stakeholder consultation QPS expressed a view that the cessation of Glencore’s copper mining and associated job loss may increase the concentration of criminal activity, and that any resultant population loss is unlikely to significantly reduce demand on their service. This rise in crime can be interpreted in several ways with respect to the social issues facing the Mount Isa region, however, is clearly indicative of ongoing demand for additional judicial infrastructure in the region.

4.3 CopperString 2032 (Northwest and Southern Spurs)

Project description: The CopperString 2032 project is a 1,100 km high-voltage electricity transmission line from Townsville to Mount Isa that will connect Queensland’s NWMP to the national electricity grid.

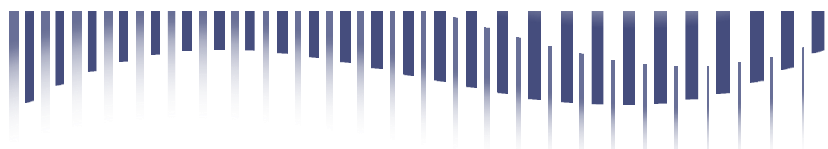
Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
5.0	4.3	4.0	3.0	2.5	1.7	3.6

This project identifies two spurs that are yet to be confirmed as part of CopperString 2032 but would deliver energy infrastructure to two significant resource development areas of the North West Minerals Province, significantly impacting the viability of copper and phosphate mining operations and expansions.

Summary impact outcomes: CopperString 2032 will provide energy certainty to the region’s critical minerals sector, delivering reliable, affordable and renewable power to the people, businesses and communities in the region. It will also allow the development of new renewable generation resources to be developed and the renewable power to be sold into the National Electricity Market (NEM). Construction is expected to support 800 direct jobs over six years and thousands of new jobs in critical minerals mining, manufacturing, and construction of renewables.

Summary commerciality outcomes: Although the project is occurring over a lengthy timeframe, regulatory approvals have been completed, and construction is due to commence shortly for the core line. Despite the length of time taken to see the

²⁸ Minister for Corrective Services - Media Release April 2024 - <https://statements.qld.gov.au/statements/100070#:~:text=The%20new%20investment%20in%20improved,total%20cost%20to%20%24885%20million>
²⁹ QCS - Annual report 2022-23 - <https://www.publications.qld.gov.au/ckan-publications-attachments-prod/resources/de654465-06d6-4612-8b98-7ac352daa7e1/qcs-annual-report-2022-23-tabled-29.09.2023.pdf?ETag=4a52855b0d5b2c5374b2a9223812a483>
³⁰ Australian Human Rights Commission - Prisoners - https://humanrights.gov.au/sites/default/files/content/letstalkaboutrights/downloads/HRA_prisoners.pdf
³¹ QPS - Mount Isa Crime Statistics - <https://mypolice.qld.gov.au/mountisa/queensland-crime-statistics/>



effect of CopperString 2032's implementation, delivery of the project can still be used as a tool for attracting investment over the short and long term to the Mount Isa region.



4.3.1 Description

The CopperString 2032 project is a 1,100 km high-voltage electricity transmission line from Townsville to Mount Isa that will connect Queensland's North West Minerals Province (NWMP) to the national electricity grid. The \$5 billion expanded project will include a 500-kilovolt (kV) line from Townsville to Mount Isa to connect the NWMP to the North Queensland Renewable Energy Zone (NQREZ), the largest renewable energy zone in the nation. This connection will form an essential part of the new Queensland SuperGrid transmission backbone to be delivered under the \$62 billion Queensland Energy and Jobs Plan. CopperString 2032 is the largest ever economic development project in North Queensland, and the largest expansion to the power grid in Australia. Figure 16, below, outlines the impact of the CopperString 2032 project³².

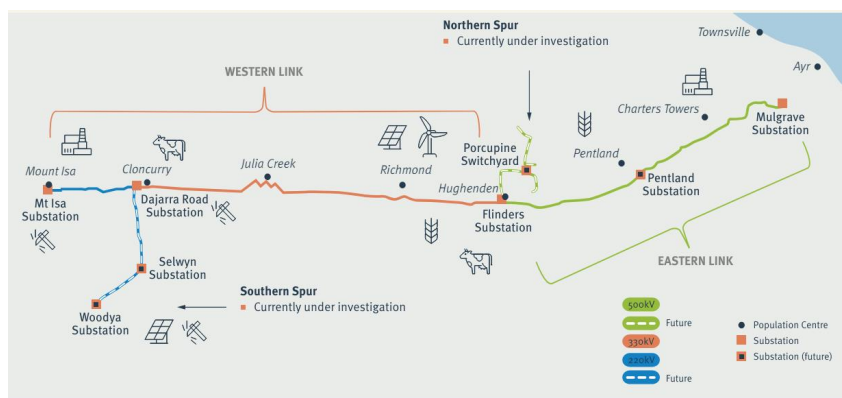


Figure 16: CopperString 2032 connectivity

The Southern Spur of CopperString 2032 is currently under investigation by Powerlink, as the Government Owned Corporation responsible for the CopperString 2032 rollout. The primary purpose of this section of line would be to provide increased access to resources and other significant commercial operations south of Cloncurry / Mount Isa. As this section of line is currently under investigation by Powerlink there is limited information available to conduct detailed analysis. The line is proposed to divert at the Dajarra Road Substation and progress south through the Selwyn Substation ending at the Woodya Substation. Notable mines in the region south of Cloncurry / Mount Isa are Selwyn Mine, Cannington Mine, Osborne Mine and Phosphate Hill mine (to the southwest).³³

The proposed Northwest Spur (Mount Isa) for CopperString 2032 is not under formal consideration for the project currently, however, represents an opportunity to service commercial operations north of Mount Isa / Cloncurry for example towards Century Mine, Lady Loretta Mine, the Eva Copper Project (Harmony) and other

³² PowerLink - CopperString 2032 Project Update - https://www.powerlink.com.au/sites/default/files/2023-12/CopperString2032_Newsletter_December_2023.pdf
³³ MITEZ - Mount Isa - Cloncurry Mining Region - <https://mitez.com.au/wp-content/uploads/2022/03/MITEZ-Mount-Isa-Cloncurry-Mining-Region-Map.pdf>



mining operations to the north. This is a proposal designed by MICC, which is currently being developed for advocacy with PowerLink and the State Government.

4.3.2 Impact

Strategic alignment

The scale of the CopperString 2032 project means that its impact on the Mount Isa economy will be broad. The majority of commercial initiatives in the region require access to power, and the current market for energy in Mount Isa is cost prohibitive to many new developments. The CopperString 2032 project is considered to be a substantial enabler of jobs in the region, and very closely aligned to MICC's vision for the region.

Due to its isolation, Mount Isa is not currently connected to NEM. Most electricity in the region is supplied through a separate power transmission and distribution network known as the North West Power System (NWPS). The NWPS has limited electricity supply options and is predominantly sourced from gas-fired generation, resulting in more expensive energy costs for users compared to those connected to the NEM³⁴.

Diamantina Power Station, owned and operated by APA, is responsible for servicing the needs of the Mount Isa region. It comprises 242 megawatt power generation from combined cycle gas turbines, plus 60 megawatt back-up from the adjacent Leichhardt Power Station open cycle facility. The region relies on a local distribution network with centralised gas-fired power generation and on-site generation for remote mining sites. Gas is supplied to the region via APA's Carpentaria Gas Pipeline³⁵.

CopperString 2032 will provide energy certainty to the region's critical minerals sector, delivering reliable, affordable and renewable power to the people, businesses and communities in the region. It will also allow the development of new renewable generation resources to be developed and the renewable power to be sold into the NEM.

Jobs and economic outcomes

Construction is expected to support 800 direct jobs over six years and thousands of new jobs in critical minerals mining, manufacturing, and construction of renewables. CopperString, along with the new \$75 million Townsville critical minerals demonstration plant, will act as a magnet for investment into North Queensland, generating additional economic and employment opportunities for the region. The project will also serve as a catalyst for green energy projects within the NQREZ - Australia's largest coordinated development of high-quality renewable energy production and storage projects, industry training sites and manufacturing.

The Queensland Government will build and own CopperString 2032, continuing the commitment made through the Queensland Energy and Jobs Plan that the state's transmission assets will be 100% publicly owned. Publicly owned transmission business Powerlink will lead work on the project now that the Queensland Government has taken ownership of the project from Queensland-based private company CuString.

It is estimated that the CopperString 2032 project will make a significant contribution to the Northwest Queensland region, including unlocking more than \$500 billion in new critical minerals in North Queensland. CopperString is the most significant investment in economic infrastructure in North Queensland in generations. Unlocking affordable renewable energy and critical minerals will benefit Townsville, Mount Isa and every town in between - unlocking thousands of jobs and billions in investment.³⁶

4.3.3 Commerciality

Delivery of CopperString 2032 is a highly complex and costly process, which is reflective of the anticipated economic benefit it will bring to the region.

³⁴ Department of State Development - What is CopperString 2032? - <https://www.statedevelopment.qld.gov.au/news/what-is-copperstring-2032-and-why-is-it-important-for-queenslands-renewable-energy-future>

³⁵ APA - Diamantina Power Station - <https://www.apa.com.au/our-services/other-energy-services/gas-fired-power-generation/diamantina-power-station/>

³⁶ Department of State Development - What is CopperString 2032? - <https://www.statedevelopment.qld.gov.au/news/what-is-copperstring-2032-and-why-is-it-important-for-queenslands-renewable-energy-future>



Deliverability

Concept assessment for the CopperString 2032 project began in 2019, with statutory approvals being granted in 2022 for the original CopperString 2.0 project, a precursor to the current CopperString 2032 which was granted approval in 2023. Construction on the project is expected to commence in mid-2024, and is currently scheduled for completion in 2029. Figure 17, below, shows the indicative timeline for CopperString 2032 which may be subject to change.³⁷



Figure 17: CopperString 2032 indicative timeline

The significant cost and complexity of CopperString 2032 results in a lengthy timeframe for completion and operationalisation, and as such will not be in a position to provide immediate impact to the critical economic situation facing the Mount Isa region following Glencore’s partial closure. Although the project is occurring over a lengthy timeframe, regulatory approvals have been completed, and construction is due to commence shortly. This means that despite the length of time taken to see the effect of CopperString 2032’s implementation, it can still be used as a tool for attracting investment over the short and long term to the Mount Isa region.

With respect to the Southern and Northwestern spurs, while these remain under consideration (in the case of the Southern spur) it is recommended that Powerlink, State Government and Council consider network funded development options to bring more load online and therefore new customers for renewable developers who might be impacted by further expansion of the CopperString 2032 project. Further engagement with the Energy Pillar of Mount Isa’s Economic Transformation Strategy is recommended with respect to CopperString 2032 as an energy sector led initiative.

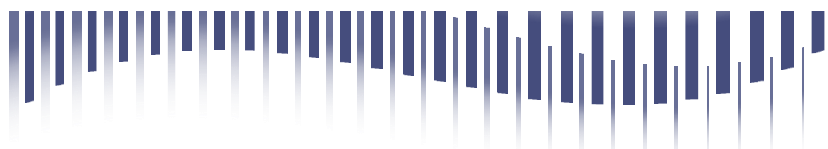
Dependencies

The multi-criteria analysis outcomes (see section 3.4.4) for CopperString 2032 Northwest and Southern Spurs identified challenges with dependencies on existing industry due to the nature of the project scope for the Mount Isa Economic Transformation Strategy. Due to the emphasis on stimulating economic activity and replacing lost jobs, a conservative approach has been taken to analyse the potential dependencies in the project. CopperString 2032 proposes substantial benefits to existing industry in the Mount Isa region (predominantly in the resources sector). While the extent of the economic benefit is heavily linked towards the continued productivity of existing industry in the region, the availability of CopperString 2032 and the connection to the NEM means that prospective contributors to the Mount Isa region will have a significant barrier to entry (access to energy) removed and an ongoing input cost to their businesses made more affordable.

Despite the concerns around linkages to existing industry in the region, a positive factor for the projects deliverability is that funding has been committed by the State Government, preliminary works including regulatory approval have been completed and construction is due to commence shortly. While the long-term economic benefits may be subject to some uncertainty due to rise and fall in demand from existing industries, a substantial number of construction jobs in the short term are guaranteed. Moreover, due to the scale of the CopperString 2032 project, investment by the State Government and advocacy from industry stakeholders, there is a strong degree of confidence that these long-term economic benefits will be realised.

4.4 Residential rehabilitation centre

³⁷ PowerLink - CopperString 2032 - <https://www.powerlink.com.au/sites/default/files/2023-08/CopperString%202032%20factsheet%20August%202023.pdf>



Project description: A residential rehabilitation centre is a dedicated, live-in facility for individuals who are struggling with substance abuse issues, supporting them to make a change. A residential facility is a more intensive form of intervention than alternatives such as substance use counselling.

Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
3.5	4.0	2.7	3.0	3.0	5.0	3.5

Summary impact outcomes: Supporting the rehabilitation of individuals suffering from substance abuse issues creates an indirect positive effect on the community by returning individuals to the workforce, who may not have otherwise been able to contribute to the economy. This is combined with the benefit of allowing people to remain in the community to access these services.

Summary commerciality outcomes: While the number of jobs created from a facility of this nature is low, it does create an additional skills pathway in the region through the expansion of and connection to wrap-around health services and counselling.

4.4.1 Description

A residential rehabilitation centre is a dedicated, live-in facility for individuals who are struggling with substance abuse issues, supporting them to make a change. A residential facility is a more intensive form of intervention than alternatives such as substance use counselling, as it allows for a structured and supervised approach to addiction recovery. There are currently services operating in Mount Isa which seek to address issues with substance abuse in the region. The Arthur Petersen Diversionary Centre (APDC) provides a diversion from custody service through rest and recovery program for Aboriginal and Torres Strait Islander adults for all who are drunk or at risk of being drunk serving as a more acute intervention for public drunkenness and disorderly conduct.³⁸ Additionally, the Salvation Army's Mount Isa Recovery Services Centre offers a residential rehabilitation program for individuals experiencing harm as a result of their alcohol or illicit drug use.³⁹ The residential rehabilitation centre proposal may take the form of an expansion to one of these existing services, in the case of APDC funding has been approved and expansion to the centre is under delivery, or the construction of a new facility to meet demand in Mount Isa and the broader region.

4.4.2 Impact

The key strengths of this proposal, with respect to the impact criteria outlined in section 3.4.2, are in the ability to address community and social needs, align to Council's vision for the region and provide an indirect, yet broad impact on Mount Isa's economy.

Community and social needs, strategic alignment and economic outcomes

As outlined in section 4.2.2 Mount Isa is a community with higher than average rates of social order, this has been identified numerous times throughout general and targeted stakeholder engagement. Stakeholders consistently expressed the view that rising crime is a concern for most residents, and is negatively impacting the sense of social cohesion in the Mount Isa community. It is well established that substance use, particularly illicit substances, are a contributor to criminal offending, with historic data from the Australian Institute of Criminology indicating that 86.6% of offenders interviewed during their study period had used some form of drug or alcohol in the 30 days prior to their arrest. It showed further that approximately 52% of users attributed their offending to substance use.⁴⁰

³⁸ Arthur Petersen Diversionary Centre - About - <https://www.nwqicss.org/services/arthur-petersen-diversionary-centre-apdc/>
³⁹ QLD Government - ADIS - <https://adis.health.qld.gov.au/service-providers/mount-isa-recovery-services-centre-salvation-army>
⁴⁰ Australian Institute of Criminology - How much crime is alcohol or drug related? - <https://www.aic.gov.au/publications/tandi/tandi439>



It should be noted that while substance use is a significant contributing factor to criminal offending, not all individuals who suffer from substance abuse issues commit crimes. The proposal for increased residential rehabilitation facilities is not exclusively linked to the criminal justice system, and should be considered part of a more integrated health and wrap-around support service, also accessible by those who have had no involvement with the criminal justice system. Regardless of the increased likelihood of criminal offending, substance use is a costly issue across the country. In 2021, the cost of addiction in Australia was estimated to be \$80.3 billion, with the largest contributors being tobacco at 45% and alcohol at 28%. Workplace and household productivity losses as a result of substance abuse are estimated at 48% of the total economic impact of substance abuse. For a region with a critical need to stimulate the economy, and secure long term sustainable jobs, the negative economic impact and lost productivity from substance abuse, as well as the human toll, represent a critical need for intervention. While measuring the effectiveness of residential rehabilitation can be difficult due to varying models of delivery, timeframes and definitions of success, there is strong evidence to suggest that attendance at a residential rehabilitation facility can improve outcomes across various domains including substance use, mental health, social outcomes and mortality.⁴¹

Jobs

The labour implications of a residential rehabilitation centre are dependent on the size of the facility, but can generally be assumed to be relatively low which is reflected in the multi-criteria scoring of section 3.4.4. To provide an indicative number desktop research has been conducted on similar facilities across the state:

- **Goldbridge Rehabilitation Services Ltd** – Goldbridge Rehabilitation Services is an organisation providing residential, and non-residential rehabilitation services on the Gold Coast, QLD. Goldbridge is classified by the Australian Charities and Not-for-profits Commission (ACNC) as a medium sized charity, with an annual revenue of approximately \$2.2 million, of which, around 86% is provided by the Government. Goldbridge employees around 15FTE of paid staff, and an estimated number of 21 volunteers to operate an organisation of this size.⁴²
- **Sunrise Way Rehabilitation Ltd** – Sunrise Way is a residential rehabilitation service in Toowoomba, QLD. Sunrise Way is also considered a medium sized charity with an annual revenue of approximately \$1.4 million of which around 61% is provided by the Government. Sunrise Way is a 20-bed rehabilitation facility, and employees 8 FTE of paid staff, and an estimated 5 volunteers to operate an organisation of that size.⁴³

While the number of jobs created from a facility of this nature is low, it does create an additional skills pathway in the region through the expansion of rehabilitation / health services and counselling. By rehabilitating individuals suffering from substance abuse issues, it also creates an indirect positive effect on the community by increasing the likelihood of returning individuals to the workforce, who may not have otherwise been able to contribute to the economy.

4.4.3 Commerciality

The commercial implications of the rehabilitation centre proposal are mixed, as outlined in section 3.4.2, with the positive of low dependency on other projects / industries, but with moderate complexity in deliverability associated with cost and land acquisition.

Deliverability

From 2021 the Queensland Government made a commitment to expanding alcohol and other drug rehabilitation services across the state. This commenced in Rockhampton but is now being expanded to Ipswich, Bundaberg and Cairns. The Government has employed a mixed delivery model for these facilities, with the land and buildings to be owned by local Hospital and Health Services, but operated by specialist alcohol

⁴¹ Scottish Government – Residential rehabilitation: literature review - <https://www.gov.scot/publications/residential-rehabilitation-review-existing-literature-identification-research-gaps-within-scottish-context/pages/6/>

⁴² ACNC Charity Register - Goldbridge Rehabilitation Services Ltd - <https://www.acnc.gov.au/charity/charities/70666e05-39af-e811-a962-000d3ad24a0d/documents/c3efc51a-3a93-ee11-be36-002248935564>

⁴³ ACNC Charity Register - Sunrise Way Rehabilitation Ltd - <https://www.acnc.gov.au/charity/charities/9f57f24b-38af-e811-a962-000d3ad24a0d/profile>



and other drugs treatment providers. These new facilities provide a relevant case study for delivery considerations and costs, should a new or expanded facility be considered for the Mount Isa region:

- **Cairns** - The State Government has committed \$19.3 million in funding to the service in Cairns.⁴⁴ This service will be dedicated to supporting young people experiencing substance abuse issues, and will also be tailored to meet the needs of First Nations young people and their families. This will be a 10-bed facility. The site comprises of single story buildings across a 7,725sqm site, which includes all necessary administrative and practical elements for a functioning facility.⁴⁵ Construction has not yet commenced on this facility, however a contractor has been identified.
- **Bundaberg** - The State Government committed \$15 million in funding to the service in Bundaberg,⁴⁶ which has now entered into the construction phase after commencing preliminary engagements in August 2021. The service will 28 beds, with 8 designated for withdrawal management and 20 designated for rehabilitation. The site is a 1.5 hectare property which will also include all administrative and practical elements necessary to a functioning facility.⁴⁷

Dependencies

Similarly to the correctional precinct proposal, a residential rehabilitation centre does not have any substantial dependencies on existing industries or other proposals under the Mount Isa Economic Transformation Strategy. Stakeholder consultation has confirmed that substance use is a present issue for the Mount Isa community, and is damaging the social cohesion that all stakeholders agree should be a goal for the community. Stakeholder engagement has confirmed that even with the expected population loss associated with Glencore's mine closure, the demographic of individuals experiencing substance abuse issues is unlikely to reduce significantly.

Drug offences in the Mount Isa policing region have increased over the last 10 years, with a 110% increase from 488 offences in 2013 to 1026 offences in 2023.⁴⁸ While it is not necessary for an individual to have been charged with an offence to seek out rehabilitation, especially in the case of alcohol consumption, this rise in drug crime serves as reinforcement for the need for increased rehabilitation services in the region.

QCS identified during stakeholder consultation that the local rehabilitation facility is often seen as a protective factor in the court system. Individuals facing criminal charges will regularly be issued bail to attend residential rehabilitation or be remanded in custody until a space at the facility becomes available. The lack of capacity in local rehabilitation services has led to individuals being imprisoned longer than they otherwise would be, preventing them from timely access to help with their addiction issues, and coming at significant cost to taxpayers. Again, this information provided by stakeholders reinforces the need for increased rehabilitation services.

⁴⁴ Minister for Health - Media Release February 2024 - <https://statements.qld.gov.au/statements/99805>

⁴⁵ Queensland Health - Cairns youth residential rehabilitation and treatment service - <https://www.health.qld.gov.au/public-health/topics/atod/services/residential-rehabilitation/cairns>

⁴⁶ ABC - Wide Bay community health providers welcome Bundaberg rehab centre promise - <https://www.abc.net.au/news/2020-10-23/residential-rehab-facility-to-be-built-in-wide-bay-qld-election/12803122>

⁴⁷ Queensland Health - Bundaberg residential rehabilitation and withdrawal service - https://www.health.qld.gov.au/public-health/topics/atod/services/residential-rehabilitation/bundaberg#section__project-timeframes

⁴⁸ QPS - Mount Isa C



4.5 Tyre recycling facility

Project description: A Tyre recycling facility is a facility for mining trucks, road trains, and large freight trucks (e.g., B-doubles). Tyre recycling plants process tyre waste into byproducts such as crumb rubber, tyre derived fuels and steel.

Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
4.0	3.7	3.0	3.7	3.0	2.7	3.4

Summary impact outcomes: a tyre recycling facility presents considerable social, economic and environmental benefits including contributing to resource recovery and emissions reductions targets, and the potential to create a moderate number of ongoing jobs (local case studies report between 18 to 30 FTE).

Summary commerciality outcomes: Key commerciality considerations include location of tyre supply and identification of downstream / end use markets for by-products. A similar facility delivered in Queensland had a capital cost of \$12 million in 2019. To further investigate this opportunity, a demand analysis is expected to cost approximately \$50,000.

4.5.1 Description

This project involves the delivery and operations of a tyre recycling facility in Mount Isa for end-of-life (EOL) road tyres (car, bus and truck) and/or off the road (OTR) tyres (e.g., mining and agricultural tractor tyres) used in North West Queensland. Recycled tyres can be used as feedstock for a number of applications, including:

- Granules and crumbs for surfacing (playground, sports flooring, artificial turf infill), civil infrastructure (backfill and retaining walls), adhesives, polymer composites and road binders in asphalt and sprayed seal
- Shredded product for waste to energy (tyre-derived fuel for combustion in kilns, furnaces and boilers).

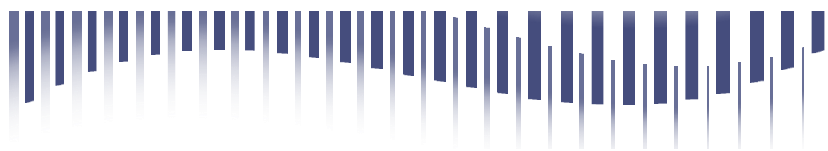
Real world use case: Sunshine Coast Council (SCC) is incorporating EOL OTR tyres into asphalt to support the region’s tougher environmental conditions. OTR tyres are highly durable and enhance road resilience and sustainability. This project is a collaboration between SCC and other regional businesses such as Boral, Allens Asphalt, Carroll Engineering, and Puma Energy Bitumen.⁴⁹

In 2022, the Federal Minister for the Environment and Water announced that EOL tyres were included on the annual Minister’s Priority Product List, meaning that companies that manufacture or import tyres are responsible for the environmental impacts of their products. While recycling of road tyres is well established in Australia (approximately 90% recovery), recovery rates of OTR tyres have consistently been low (less than 11% for the past three to five years). Road tyres and OTR tyres have different compositions is an important factor for the end-of-life processing stage. The composition impacts the performance and quality of the tyre-derived material in end markets, and the health and environmental impacts of the material. For larger OTR tyres, sophisticated equipment is required to effectively shred and separate the steel for further processing. they have the capacity to reprocess, we need to understand is which tyres contain high proportions of fibre. Chemical recycling processes are also emerging in the global market, such as pyrolysis and de-vulcanisation.⁵⁰

Case study: In 2020, BHP partnered with Novum Energy to recycle OTR tyres from all seven BHP sites in Queensland. The plant targeted to process 19,000 tonnes of rubber per annum with nine million litres of fuel oil, 4,500 tonnes of recycled carbon black and 2,500 tonnes of waste steel and excess syngas for electricity

⁴⁹Tyre Stewardship Australia. (2024). Tipping the balance. <https://www.tyrestewardship.org.au/wp-content/uploads/2024/01/TSA-OTR-Tipping-the-balance-Full-report.pdf>

⁵⁰ Ibid



generation produced as a by-product. The plant’s operations created 30 jobs in the Bowen Basin and contributed to emissions reduction for BHP.⁵¹

4.5.2 Impact

Social, economic and environmental benefits

This project leverages the region’s key industries of mining and agriculture and supports the circular economy of Mount Isa’s economic base. The potential social, economic, and environmental benefits of tyre recycling include:

- Contribute towards achieving State and National policy objectives and targets including emissions reduction:** The use of road tyres in asphalt for roads resulted in an improvement of six to 14% emissions reduction when compared to the conventional fossil-derived approach.⁵² Even though the collection and processing of agricultural OTR tyres is more emissions-intensive, a 4 to 10% improvement compared to the conventional alternative is estimated.⁵³ See Figure 18 for a comparison of emissions.

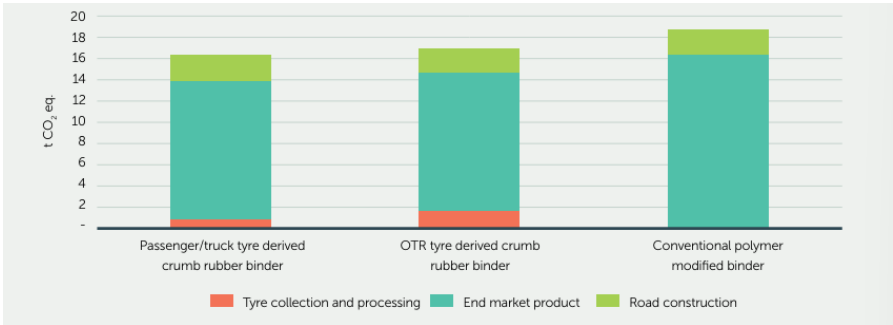


Figure 18: Estimated emissions impacts from using crumb rubber from tyre processing in roads

- Reduced waste:** such a facility can reduce the volume of tyres going to landfill, stockpiling, illegal dumping and burning of tyres and exposure to associated harms, such as risk of fire, degraded natural environments, and lost visual amenity
- Social and cultural benefits:** Reduced burial of tyres in mining pits on land which is not owned by mining companies but is temporarily occupied during the mines life (e.g., mining leases).
- Value add:** Recovery supply chain and value-added opportunities including expanding onshore economic activity to capture the valuable resources contained in OTR tyres. Australia produces approximately 130,000 tonnes of OTR tyres annually. Based on current market prices, the recycled by-products of crumb rubber and recovered steel are estimated to amount to \$62 million and \$11 million respectively (depending on quality). Therefore, by burying or stockpiling OTR tyres, potentially \$70 million in commodity value is forfeited each year.⁵⁴
- Jobs:** Two Queensland based tyre recycling facilities employ between 18 FTE employees (Green Distillation Technologies plat at Toowoomba) and 30 FTE employees (BHP and Novum Energy in the Bowen Basin).

⁵¹ BHP. (2020). Australian recycling first creates new jobs in the Bowen Basin. <https://www.bhp.com/news/articles/2020/08/australian-recycling-first-creates-new-jobs-in-the-bowen-basin>

⁵² Based on a range of asphalt mix designs derived from Australian road construction specifications.

⁵³ Edge Environment, sourced in Tyre Stewardship Australia. (2024). Tipping the balance. <https://www.tyrestewardship.org.au/wp-content/uploads/2024/01/TSA-OTR-Tipping-the-balance-Full-report.pdf>

⁵⁴ Tyre Stewardship Australia. (2024). Tipping the balance. <https://www.tyrestewardship.org.au/wp-content/uploads/2024/01/TSA-OTR-Tipping-the-balance-Full-report.pdf>



4.5.3 Commerciality

Deliverability

At a high level, the tyre recycling process involves:

- Identification, collection (or delivery) and storage of EOL tyres which are unsuitable for re-tread, repair or re-use
- Processing in one or more stages, which may involve transfer from to another processing facility for combination with another tyre material
- Shipping / transportation of processed materials to end markets
- Use in end markets as a final product or as a commodity input.
- Commercial activities therefore need to account for several considerations including supply, location of feedstock, tyre size, proximity to road tyre recycling facilities, and demand for end uses.⁵⁵

In terms of delivery costs, a Green Distillation Technologies tyre recycling facility in Australia cost approximately \$12 million to deliver in 2019, however costs are anticipated to have risen significantly in the five years subsequent. A plant of this size can process around 19,000 tonnes of tyres per year. Typically, tyres will yield:⁵⁶

- 10 kilogram car tyre: Four litres of oil, 4 four kilograms of carbon, two kilograms of steel
- 70 kilogram truck tyre: 27 litres of oil, 28 k kilograms g of carbon, 15 kilograms of steel
- Four tonne oversize mining dump truck tyre: 1.6 tonnes of carbon, 0.8 tonne of steel and 1500 litres of oil.

Dependencies

While this project is dependent on the supply of EOL tyres in the North West, the mining, agriculture and transport and logistics industries are key economic generators in the region, therefore there is limited supply risk.

4.6 Public aged care capacity for high and complex care needs

Project description: There is currently a lack of high complex needs public aged care in Mount Isa. As a result, ageing residents with complex needs are transferred to Townsville for care or have extended hospital stays. While existing facilities successfully service some of the population, there are still many members of the community who require accommodation.

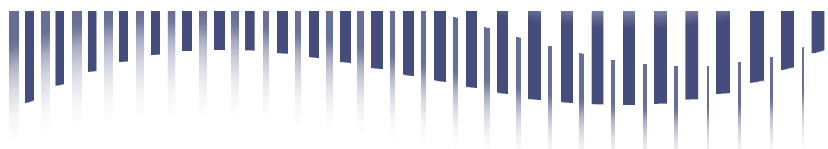
Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
3.5	3.3	3.7	3.7	1.5	4.3	3.4

Summary impact outcomes: Long-term residents of Mount Isa feel a strong sense of connection to the region, and it is therefore problematic that many are required to move to access suitable aged care facilities. This results separation of families and can cause negative wellbeing outcomes for residents.

Summary commerciality outcomes: The demand for specialist aged care services in Mount Isa is likely to remain relatively constant, and is not strictly reliant on the existence of any one industry, or the success of any other prospective projects outlined in this strategy.

⁵⁵ Tyre Stewardship Australia. (2024). Tipping the balance. <https://www.tyrestewardship.org.au/wp-content/uploads/2024/01/TSA-OTR-Tipping-the-balance-Full-report.pdf>

⁵⁶ Green Distillation Technologies. (2019). Media Release: Massive gap in Australia's tyre recycling capacity. <https://www.gdtc6.com/australia-tyre-recycling-capacity/#:~:text=%E2%80%9CThe%20only%20thing%20holding%20us,status%2C%E2%80%9D%20Trevor%20Bayley%20said.>



4.6.1 Description

Stakeholder consultation identified that there is currently a lack of public, affordable aged care in Mount Isa for those with high and complex care needs. As a result, ageing residents are forced to relocate to find a suitable bed, or are housed in unsuitable facilities, or experience extended hospital stays. There are a number of flow-on effects that the aged care industry brings from both an economic standpoint, and a social cohesion standpoint.

The aging population in the area is currently serviced by two main aged care facilities, being the Laura Johnson Home and Injilinj Aged Care Facility.

- Laura Johnson Home:** In 2012, Laura Johnson Home finalised a contract for the construction of a \$17 million dollar aged care facility to be able to provide a 75 bed nursing home to cater for respite and permanent residents. The project was funded by the Federal Government through the Rural and Regional Building Fund Grant. It operates as a not-for-profit and provides all residents with meals, room cleaning, laundry services, 24/7 nursing care, onsite doctors and assistance to attend appointments and access to basic essentials. Consultation with the Laura Johnson Home indicates that the facility is under-capacity currently for general aged care placements but is experiencing demand requests for high and complex care placements. This will be partially addressed through investment to transform 8 beds into more suitable accommodation for high and complex care residents.
- Injilinj Aged Care Facility:** The Injilinj Aged Care Facility works closely with the Laura Johnson home and is able to support only 12 patients, the types of care that are offered are residential aged care, palliative care and non-dedicated respite. It provides short term accommodation to older people and younger people with disabilities who are from an indigenous background. They are only able to provide a very low number of permanent residential care for the community.

While these facilities are successful in servicing a portion of the population, there are still many members of the community who require a more affordable solution to aged care accommodation.

4.6.2 Impact

A public aged care facility scored moderately against all multi-criteria analysis categories, due to its balance of both social and economic impact.

Community and social needs

Public aged care is an essential service, especially for rural communities where residents often have a strong sense of connection to their community. Stakeholder consultation with the Northwest HHS has identified that Mount Isa's hospital system experience significant capacity constraints, and regularly services elderly patients for a wide range of treatments. A fit for purpose aged care facility with inbuilt access to health services would substantially reduce the demand for public hospital services, enabling the HHS to better service other members of the community. In addition to health services, a residential aged care facility can serve as a hub for social support, rehabilitation services and government / administrative services. The centralisation of these features can improve quality of life for elderly residents and reduce the burden on local families / services who may not otherwise be able to provide comprehensive centralised care.

Public aged care can also foster a sense of community and social cohesion among residents. Elderly people, and particularly those in a rural location, are vulnerable to isolation due to both geographic, social and mobility barriers. A public aged care facility has the potential to serve as a hub of social activity, it can offer programs and events that encourage interaction between residents, their families and the broader community. These events can combat loneliness and social isolation and improve the well-being of elderly members of the community.



Long-term residents of Mount Isa feel a strong sense of connection to the region, and it is therefore problematic that many are required to move to access aged care facilities. This results separation of families and can cause negative wellbeing outcomes for residents. This is particularly the case in First Nations elderly people who hold land and connection to country in great significance, with fundamental ties to their identity.⁵⁷

Jobs and economic outcomes

As outlined in section 1.1.2, healthcare and social assistance is one of the largest industries in the Mount Isa region, contributing \$113 million in value to the economy.

There are a number of case studies that can be examined to identify the labour and economic impacts of a residential aged care facility:

- **Laura Johnson Home, Mount Isa:** Laura Johnson Home in Mount Isa was constructed with a \$17 million dollar budget to provide a 75 bed facility. It operates as a not-for-profit and provides all residents with meals, room cleaning, laundry services, 24/7 nursing care, onsite doctors and assistance to attend appointments and access to basic essentials. Laura Johnson home has had an additional infrastructure investment over the last several years to expand their services with the inclusion of garden villas and staff accommodation.
- **Moonta Health and Aged Care Services, Moonta:** Moonta Health and Aged Care Services is classified as a large charity by the Australian Charities and Not-for-profits Commission (ACNC) with an annual revenue of approximately \$8.5 million. Of this annual revenue approximately 95% is received from Government sources. Moonta Health and Aged Care Services employs approximately 70 FTE, with 10 volunteers to support their operation.
- **Mount St Joseph's Home, Sydney:** Mount St Joseph's Home is classified as a large charity by the ACNC, with an annual revenue of approximately \$21.3 million. Of this annual revenue, approximately 74% is received from Government sources while 17% is received as revenue from goods and services. Mount St Joseph's Home employs 150 FTE, with 86 volunteers to support their operation.

The intensity of service provided by most residential aged care facilities, as demonstrated by the above case studies, results in a significant labour requirement. This is advantageous for Mount Isa noting the specific context of the economic transformation project.

4.6.3 Commerciality

Deliverability

A large-scale aged care facility would require a moderate investment in capital expenditure, Laura Johnson Home in Mount Isa naturally provides a fair comparator, noting it was initially developed in 2012 and external economic pressures would likely increase the cost in today's figures. Outside of land acquisition, the construction of a residential aged care facility would be a straightforward construction project, which many local / domestic construction providers would have the established skillset to complete. Estimated timeframes for completion are unlikely to extend beyond the short to medium term (i.e., one to three years) dependant on efforts to expedite the process and any unforeseen external events which would impact the construction timeline.

Dependencies

The demand for aged care services in Mount Isa is likely to remain relatively constant, and is not strictly reliant on the existence of any one industry, or the success of any other prospective projects outlined in this strategy. According to census data, approximately 26.6% of the Mount Isa population are aged 50 years or over. These age brackets begin to become eligible, and may see increased desirability in some form of aged care, supported living, or lifestyle accommodation facility. It should also be noted that First Nations residents are eligible for aged care placement from 50 years of age.

⁵⁷ Welcome to Country - Connection to Country - <https://experience.welcometocountry.com/blogs/learning/connection-to-country>



While the demand for aged care services is not typically seen as industry dependent, it is naturally predicated on a large enough population to support the need for these services. Noting the context of the Mount Isa Economic Transformation Strategy, and the potential for a substantial loss in population, expanded residential aged care services is at risk of not returning the expected economic outcomes in the instance of a significant population loss.

4.7 Mount Isa Rail Line upgrades

Project description: Weather resilience measures to improve reliability and structural gauge upgrades to allow for double stacking to increase the efficiency and use of the line.

Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
3.5	3.3	3.0	3.3	2.8	3.7	3.3

Summary impact outcomes: Considerable economic benefits associated with reduced reliance on road freight during weather events and for western freight flow.

Summary commerciality outcomes: Upgrades likely to be costly but have the potential to reduce costs and increase revenues for Queensland Rail to reinvest in the line to improve operational efficiency.

4.7.1 Description

The Mount Isa Rail Line upgrades includes a suite of projects that would improve the efficiency and use of the rail line, including flood and heat resilience measures, structural gauge improvements and increasing the maximum allowable height to allow for double stacking. Addressing these limitations will increase reliability of rail freight as a mode of transport and increase volumes transported on the line through double stacking, as well as the effective bi-directional flow of freight and empty containers.

Resilience: North West Queensland is subject to some of the harshest weather conditions in Queensland, including periods of extreme heat and monsoonal rain.⁵⁸ Extreme heat causes a reduction in allowable train speeds with the maximum speed of 80 kilometres per hour reducing to 60 kilometres per hour during summer, and the effective average speed for the Mount Isa to Townsville journey being less than 40 kilometres per hour.⁵⁹ Extreme wet weather and flooding events reduces reliability due to track closures. In 2019, the Mount Isa Line sustained damage due to extensive flooding and was not operational for three months for repairs.⁶⁰ Rail upgrades to increase resilience include resleepering, rerailing, bridge and culvert upgrades.

⁵⁸ Queensland Rail. (2024). Mount Isa Line Information Pack.
⁵⁹ Australian Railway Association. (2023). The future of freight.
⁶⁰ QR. (2024). <https://www.qca.org.au/wp-content/uploads/2024/03/queensland-rail-responsive-queensland-rail-2025-dau.pdf>



Double stacking: There is an opportunity to increase volumes on the Mount Isa Line through container double stacking. Current challenges to achieving the proposed structural gauge (See Figure 19) of one standard container and one half height container to the Port of Townsville are bridge heights along the line at three locations east of Stuart on the Mount Isa Line (at Mingela, Charters Towers and Burra) and two west of Stuart on the North Coast Line and Jetty Branch. The purpose of this component of the initiative is to use the spare capacity on the western bound trip for freight currently transported by road, including Copper Sulphate, Xanthate, Dextrin, Caustic Soda, Bagged Cement, Grinding Media, Refractory Bricks, Minbar and other packaged commodities.⁶¹

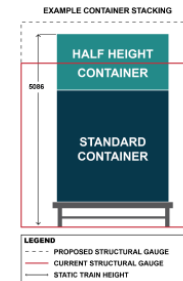


Figure 19: Structural gauge

4.7.2 Impact

Strategic alignment and industry need

Improving the reliability, resilience and efficiency of the Mount Isa Line will benefit above and below line rail operators and freight generators in the region. Rail freight is (or has the potential to be) a key component of several of the industries in Mount Isa's economic base, including resources, agriculture and energy. The poor resilience of the line during severe weather events is a critical gap in the region's supply chain network, and the inability to double-stack is resulting in the inefficient flow of bi-directional freight. Therefore, addressing these problems is strategically aligned to the region's competitive advantages and industry priorities.

Economic outcomes

The key economic outcomes of this project include:

- **Avoided externalities associated with road freight:** Analysis by BITRE determined that with no alternative rail route in North West Queensland, disruption along the Mount Isa Line causes freight to shift to road. This results in increased road traffic along the Flinders Highway by 92% and an additional total annual cost of \$45 million.⁶² Other externalities include increased carbon emissions and safety incidents associated with road freight, as described in Section 4.1.2.
- **Economies of scale associated with double stacking:** Queensland Rail and Deloitte have modelled a cost reduction of 16% (\$ / Net Tonne) for a train that has 50% of the wagons double stacked⁶³
- **Increased productivity and efficiency:** Rail freight will be able to travel faster and operate more reliably and consistently throughout the year with improved flexibility to optimise payloads. This may drive cost efficiencies and has the potential to reduce costs to new users.⁶⁴ Any new user uptake will also increase revenue to Queensland Rail for reinvestment in Mount Isa Line rail infrastructure.

4.7.3 Commerciality

Deliverability

Resilience upgrades to the Mount Isa Line are costly, with the Queensland Government allocating \$379 million for capital upgrades and maintenance in the FY 2023 State Budget.⁶⁵ While this investment is being delivered over five years, the rail line was still out of action for several weeks most recently in 2024 due to flooding. Therefore, resilience measures for the Mount Isa Line are expected to be costly. Further investigation in upgrade options and costs is required to prioritise and target investment and the critical points along the line.

⁶¹ MITEZ & Glencore. (2024). Rail Strategy -Mt Isa Line

⁶² BITRE. (2023). Road and Rail Supply Chain Resilience Review - Phase 1. Building an evidence base of road and rail supply chain resilience. https://www.bitre.gov.au/sites/default/files/documents/Road%20and%20Rail%20Supply%20Chain%20Resilience%20Review_Final.pdf

⁶³ Queensland Rail. (2024). Mount Isa Increased Structural Gauge Project.

⁶⁴ MITEZ & Glencore. (2024). Rail Strategy -Mt Isa Line

⁶⁵ Queensland Government. Parliamentary Committees. (2022). 2022-2023 Budget Estimates. <https://documents.parliament.qld.gov.au/tp/2022/5722T1008-E921.pdf>



Queensland Rail has already identified works to increase the resilience of the line, they are below:

- Resleepering - Queensland Rail is planning a program of works which would see all steel sleepers replaced with full depth concrete sleepers to enhance the resilience of the track itself.
- Rerailing - Queensland Rail is planning a program of works to replace light rail with heavy 60 kilogram per metre rail to increase the resilience of the track itself.
- Queensland Rail aims to continue the re-sleepering and re-railing to complete the transformation of the entire System. According to Queensland Rail the current timing of the program is dependent on sufficient growth occurring on the line to provide the additional funding for these works. Should significant additional tonnes be contracted on the network, the works program could be accelerated to coincide with the increased traffic.⁶⁶

The other aspect of Mount Isa Line upgrades are initiatives that improve the productive capacity and throughput of the line. The critical commercial considerations of the double stacking deliverability include:

- Freight users on the Mount Isa Line are only using 35% of its capacity, with 8,320 TEU travelling empty from Townville to Mount Isa annually.⁶⁷ Further investigations are required to determine whether there is sufficient demand for freight currently travelling west on the road to shift to rail.
- Bridges along the rail line limit heights which impact container types to be double-stacked - this would need to be addressed to allow for bi-direction rail flow and is likely to be costly.
- Double-stacking requires certification / approvals from Queensland Rail, however, this process is onerous and time consuming.⁶⁸
- The availability of intermodal sidings is required to allow double stacking - this is reliant on above rail operators allowing siding access and lifting at a competitive price.

Dependencies

The efficient operation of the Mount Isa Line supports several key industries in the region that generate economic outcomes for the region. While investment in the rail line is depending on rail freight demand, these key industries are expected to continue to play a key role in the Mount Isa economy post transformation.

4.8 Mount Isa Transport and Logistics Centre (TLC)

Project description: The goal of the TLC is to improve the diversification of Mount Isa’s economy through attracting investment and lowering operational costs, support the resources sector and to enhance the competitiveness of the regions transport and logistics network.

Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
5.0	3.7	2.7	3.7	3.0	1.0	3.3

Summary impact outcomes: The major benefits of the proposed TLC are diversification of the Mount Isa economy, as well as accelerating the development of freight and logistics activities and attracting new businesses and industries that can benefit from improved market access.

Summary commerciality outcomes: Given the focus on the long-term nature of the TLC, it is likely and intended that the initial development of the TLC will attract industries in the future that are not currently ‘on foot’, thereby generating greater demand and industry diversification beyond the resources sector.

⁶⁶ Queensland Rail - Mount Isa Line Information Pack 2024 - <https://www.queenslandrail.com.au/business/access/Documents/Mount%20Isa%20Line%20System%20Information%20Pack%20-%20Issue%204.0%20-%20January%202024.pdf>

⁶⁷ MITEZ & Glencore. (2024). Rail Strategy -Mt Isa Line

⁶⁸ Ibid



4.8.1 Description

A dedicated Mount Isa TLC has been under consideration in the region for a number of years, since the development of Mount Isa's 2017 Economic Development Strategy. The goal of the TLC is to improve the diversification of Mount Isa's economy through attracting investment and lowering operational costs, support the resources sector and to enhance the competitiveness of the regions transport and logistics network.

Mount Isa's GRP is estimated at \$8.4 billion. In Mount Isa, mining is the most productive industry, generating \$7.1 billion of value add⁶⁹ in FY23, accounting for 88% of total value add across all industries. While the strategic goals of this project include the diversification of Mount Isa's economy, there is an acknowledgement that the resources sector will still play a pivotal role in Mount Isa's economic development moving forward. In order to create efficiencies in these operations, and other large sectors within Mount Isa's economy (e.g. Agriculture and construction), a cost effective transport and logistics environment must be developed.

Previous feasibility work on the Mount Isa TLC has identified a number of design considerations for the facility, to ensure that it meets strategic objectives, these include:

- **Common user facilities:** A lack of common user infrastructure in the region is a significant barrier to new and expanding industries in Mount Isa, especially for smaller operations who are not able to economically develop large scale infrastructure projects based on their demand alone.
- **Rail freight infrastructure and rail extensions:** A mode shift from road to rail is critical in improving regional productivity and supply chains. Road freight is expensive, disruptive and results in a number of safety hazards for other road users. The TLC represents an opportunity to ensure that rail freight is the most attractive and cost effective logistics solution for businesses of all sizes.
- **Renewable energy generation:** Generating renewable energy is of increasing importance to meeting climate targets nationally, and particularly important in the Mount Isa region given the barriers to accessing affordable energy which have been outlined throughout this report. The TLC has a significant opportunity to incorporate "green" design features including solar, wind and waste-to-energy systems.
- **Consumable and perishable goods capacity:** In addition to supporting the resources industry the TLC has the opportunity to become a hub and distribution centre for consumable goods alongside other dry consumer goods, positioning Mount Isa as a key part of the consumable goods supply chain for the North West Queensland region. Design features to accommodate the transport and storage of perishable goods should be considered.
- **Agriculture sector enabling design elements:** The TLC land may provide opportunities for agricultural development in an optimal location with efficiencies gained through greater scale than any agricultural user could generate at a purpose-built single user facility. Facilities to cater for the agricultural industry could include holding yards, areas for spelling, storage and additional land that could be adapted and used by the industry as required.

4.8.2 Impact

The Mount Isa TLC has a significant opportunity to optimise the transport and logistics capabilities of the region, therefore reducing barriers to investment across several industries.

⁶⁹ See section 1.1.2



Strategic alignment

While Mount Isa has historically been heavily reliant on the resources sector, it cannot rely on this industry alone. The lack of transport and logistics and other common user infrastructure in Mount Isa is a key hurdle for new and expanding mines and other new businesses to build viable business cases for investment in the region. This results in significant opportunity costs to Mount Isa. The TLC is an initiative that touches across a number of pillars in Mount Isa's Economic Transformation Strategy, and as such is well aligned to the strategic vision of MICC.

A key highlight of the TLC is its proposal to offer common user infrastructure such as processing facilities and roadhouse amenities. As economic activity can be expected to concentrate where businesses benefit from shared infrastructure, well planned infrastructure will reduce project development costs and enable trade flows. Providing common user facilities will encourage smaller businesses to the region as it represents a signal to industry that it is supported by Local and State Governments through commitment to broader commercial freight and logistics infrastructure and growth. Enabling infrastructure will allow smaller businesses to establish operations in Mount Isa as they would benefit from efficient and flexible access to the freight and logistics network.

With respect to common user infrastructure, stakeholders have also identified the possibility to expand the original concept for the Mount Isa TLC to include additional services relevant to transport and logistics. The following features have been raised by stakeholders as meritorious for inclusion in a re-scoped TLC facility:

- **Heavy vehicle maintenance:** While the benefits of mode shift from road to rail have been outlined throughout this report, it is important to acknowledge that this shift will happen gradually. Road transport is still expected to be a crucial part of the supply-logistics chain across a number of industries in the Mount Isa region in the years to come. To that end, it is recommended that the revised TLC scope include the facilities for maintenance and repair of heavy vehicles (trucks and road-trains). Through the resources sector Mount Isa has a large skill base for machinery maintenance and repair. In response to the shutdown of Glencore's mining operations, an expansion to the TLC concept could present an opportunity to preserve these skills in the region.
- **Electric vehicle charging:** The Queensland Government has reaffirmed its commitment to zero emissions transport through *Queensland's Zero Emission Vehicle Strategy 2022-2032*.⁷⁰ The Government has set a target that 50% of new passenger vehicle sales to be zero emission by 2030, moving to 100% by 2036. In addition 100% of eligible Queensland Government fleet passenger vehicles to be zero emission by 2026. In order to support, and capitalise on the strategic goals of the Queensland Government, Mount Isa should seek to expand its infrastructure for EV Charging. Under a revised scope for the Mount Isa TLC, there is the potential for a coordinated point for EV Charging for both commercial and private vehicles.
- **Hydrogen fuel cell vehicles:** Hydrogen fuel cells convert fuel into energy through an electrochemical reaction with hydrogen gas and oxygen. This produces electricity, which powers the electric motor that drives the car. Hydrogen fuel cell vehicles only produce tailpipe water vapour and heat, meaning they produce zero noxious and greenhouse gas emissions. There are currently 2 hydrogen fuel cell vehicle models approved for use in Australia from Toyota and Hyundai. However, these are available for special order only and not for everyday sale and use.⁷¹ While hydrogen fuel cell technology is an emerging field in the Australian market, Mount Isa is poised to be an early adopter through the proposed TLC, which could include scope for facilities at all stage of hydrogen fuel cell use.

An objective of the TLC is to increase the efficiency and accessibility of the Mount Isa to Townsville freight and logistic network. To deliver this objective, increasing the volumes of freight handled in Mount Isa is necessary.

⁷⁰ Queensland Government - Queensland's Zero Emission Vehicle Strategy - <https://www.qld.gov.au/transport/projects/electricvehicles/zero-emission-strategy#:~:text=The%2010%2Dyear%20strategy%20reaffirms,be%20zero%20emission%20by%202026>

⁷¹ Australian Government - Green Vehicle Guide - <https://www.greenvehicleguide.gov.au/pages/LowAndZeroEmissionVehicles/HydrogenVehicleInformation>



However, increasing volumes and productivity is only achieved through providing high-efficiency transport and logistics facilities that allow handling of freight volumes in Mount Isa.

Jobs and economic outcomes

The major benefits of the proposed TLC are diversification of the Mount Isa economy, as well as accelerating the development of freight and logistics activities and attracting new businesses and industries that can benefit from improved market access. There is a broader opportunity to trigger a shift in the Mount Isa economy by lowering barriers to entry for new business in the region. The proposed TLC is intended to prepare the region to be investment-ready, providing a clear signal to the private sector that enabling infrastructure is available to accommodate and support long-term future investments in the region.

In 2020, a detailed business case for the Mount Isa TLC identified that Council would need to fund approximately \$21 million in capital costs for land acquisition, site works including land clearing, utility headworks and road construction to the TLC's boundary gate, as well as approximately \$17 million in total operating costs over 30 years to cover ongoing maintenance of the land. Due to broader economic pressures such as inflation and rising supply costs globally, these figures would require a detailed re-evaluation should MICC wish to advance the project, however, can be considered a baseline figure for development works.

It is noted that the business case was conducted prior to the Glencore's announcement of cessation of copper mining activities, however, in return for this investment the 2020 TLC business case anticipated:

- Between 463 and 724 new full-time jobs in the Mount Isa region
- Between 41 and 64 new businesses in the Mount Isa region
- Between \$11 and \$19 million in labour surplus
- Between \$21 and \$37 million in producer surplus
- Up to \$3 million in net benefits due to mode shift from road to rail.

4.8.3 Commerciality

Dependencies

The TLC's development would benefit significantly from a 'foundation customer', to confirm the initial viability of the facility and attract a greater number of smaller users. Previous assessment of the Mount Isa TLC identified that this foundation customer has significant potential to be an organisation mining or trading phosphate in or around the Mount Isa region. Demand from phosphate in the region has significant potential to underpin the feasibility and success of the TLC with phosphate rock being a major resource in Mount Isa and in the North West Minerals Province. There are several large deposits in the region with more than one phosphate organisation expressing interest in becoming a TLC foundation customer. It is recommended that MICC engage further with producers in the region to determine ongoing interest in a facility of this nature.

The significance of having a foundation customer to underpin the feasibility of the TLC goes beyond having a primary user of the facility. A foundation customer essentially provides signals to the private sector regarding the viability and opportunity available to other prospective users of the TLC. A secured primary user is likely to attract other junior miners and other smaller organisations in the region, contributing to MICC's overall goal to assist and support the mining industry while also diversifying the economy with the introduction of new local businesses.

Given the focus on the long-term nature of the TLC, it is likely and intended that the initial development of the TLC will attract industries in the future that are not currently 'on foot', thereby generating greater demand and industry diversification beyond the resources sector. Key to this will be effective and well thought out staging



and planning of the TLC’s long-term development. Enabling these industries supports one of the key objectives of the TLC, to generate economic diversification and long-term prosperity for the region.

Deliverability

The Mount Isa TLC is a large scale, complex and costly piece of infrastructure, and therefore comes with a number of deliverability considerations. This complexity is represented in the multi-criteria scoring for both dependencies and deliverability.

Council has the opportunity and ability to ‘de-risk’ the TLC’s development by creating the regulatory pathway for its delivery, such as through land acquisition, provision of enabling infrastructure such as utilities and roads, and facilitation of approvals processes. In real terms, the Project’s cost estimates depend on the level and scale of infrastructure developed and ranged from \$17 million to \$383 million at the time of the 2020 business case, noting that the more substantial investment included a concentrator co-located with the TLC.

For the preferred option resulting from the 2020 business case, the cost breakdown in Table 11, below, was established. This breakdown of costs is from the perspective of MICC only, not accounting for significant additional investment required from industry stakeholders and facility users. It is further noted that these figures were current in 2020, and as such will require detailed re-evaluation, they should be considered indicative only.

Table 11: Total project cashflow predicted as at 2020 TLC business case

Item	Value (\$'000)
Capital costs	20,697
Operating costs	17,387
Revenue - Land sale	25,396
Revenue - Council rates and charges	7,903
Net cost	4,786

For detailed figures and considerations, it is recommended to consult the *Mount Isa Transport and Logistics Centre Business Case* prepared for MICC in March 2020.

4.9 Domestic and family violence accommodation

Project description: Domestic and family violence accommodation, often referred to as crisis accommodation, women’s shelters, or refuges, is a safe place for individuals experiencing domestic and family violence to relocate during times of crisis.

Strategic alignment	Community and social needs	Jobs	Economic outcomes	Deliverability	Dependencies	Weighted score
3.0	3.7	2.3	3.0	3.0	5.0	3.3

Summary impact outcomes: By providing a space with adequate physical security, positive social impact outcomes can be achieved. Victims have increased safety, and stakeholders can more effectively deliver their existing work in protecting victim’s safety and providing support services, by placing physical barriers between victims and perpetrators.

Summary commerciality outcomes: The construction of new domestic violence accommodation is unlikely to have a large direct economic impact outside of the construction phase, despite this, there are indirect economic benefits to be gained from assisting victims of domestic violence, who may under different circumstances be contributing members to the economy where they in a position of safety to do so.



4.9.1 Description

Domestic and family violence accommodation, often referred to as crisis accommodation, women’s shelters, or refuges, is a safe place for individuals experiencing domestic and family violence to relocate during times of crisis. Domestic and family violence is an emergent issue across the country, an issue which disproportionately effects women. One in four (23% or 2.3 million) women and one in 14 (7.3% or 693,000) men have experienced physical and/or sexual violence from an intimate partner since the age of 15. There are many complicating factors that influence an individual’s ability to seek help, or leave, when experiencing a violent relationship. A key challenge is finding a safe place to relocate, with appropriately physical security and often on a limited budget (see Figure 20)⁷².

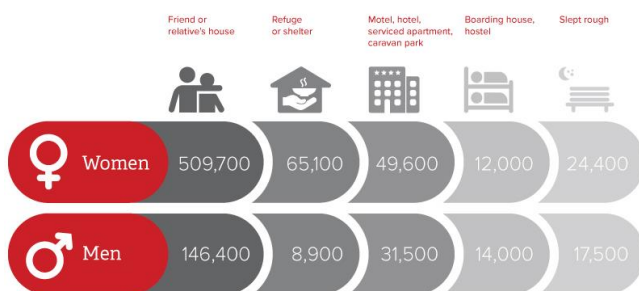


Figure 20: Instances of homelessness after leaving a violent home

Domestic and family violence accommodation is a service that makes a tangible difference to women’s safety, it has the potential to save lives. This proposal represents the opportunity to construct dedicated domestic and family violence crisis accommodation in Mount Isa, a city which experiences a proportionally high number of domestic and family violence cases, with an extremely limited access to intervention services. According to Contravention of Domestic Violence Orders brought before the court in 2023, Mount Isa demonstrated a rate of charges at approximately one in 15 (with an assumed population of 20,000^{73,74}), compared to a Queensland wide rate of one in 140 (assuming a population of 5,495,524⁷⁵).^{76,77}

4.9.2 Impact

The key strengths of this proposal, with respect to the impact criteria outlined in section 3.4.2, are in the ability to address community and social needs and align to Council’s, and other key stakeholders’ vision for the region.

Community & social needs and strategic alignment

Multiple stakeholders indicated during consultation that domestic and family violence is a significant problem for the Mount isa community. Instances of breach of domestic violence orders have risen dramatically in Mount Isa in the last 10 years, up nearly 300% from 634 offences in 2013 to 2500 offences in 2023.⁷⁸ While there are many other types of domestic violence offence than a breach of domestic violence order, breach of domestic violence order alone accounts for over 18% of all offences committed in the Mount Isa policing region.

A core component of the Queensland Government’s response to domestic and family violence is the implementation of High Risk Teams (HRTs) which are an integrated service response to high risk domestic violence offending, focused on keeping victims safe, and holding perpetrators accountable. HRTs membership

⁷²AHURI - Housing, homelessness and domestic and family violence - <https://www.ahuri.edu.au/analysis/brief/housing-homelessness-and-domestic-and-family-violence>
⁷³Mount Isa City Council - Welcome to Mount Isa - <https://www.mountisa.qld.gov.au/city-and-council/welcome-to-mount-isa>
⁷⁴ABS - Mount Isa 2021 Census - <https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA35300>
⁷⁵Queensland Government Statisticians Office - Queensland Population Counter - <https://www.qgso.qld.gov.au/statistics/theme/population/population-estimates/state-territories/qld-population-counter>
⁷⁶Queensland Courts - Queensland Courts’ domestic and family violence (DFV) statistics - <https://www.courts.qld.gov.au/court-users/researchers-and-public/stats>
⁷⁷Caveat: these figures are provided for illustrative purposes only and should not be considered wholly reflective of occurrences of domestic violence in Mount Isa.
⁷⁸QPS - Mount Isa Crime Statistics - <https://mypolice.qld.gov.au/mountisa/queensland-crime-statistics/>



includes; specialist domestic violence services, police, corrections, courts, child safety, youth justice, housing and more. The HRT system has been deployed in only 10 locations across Queensland, of which Mount Isa is one. This is indicative of the volume of domestic and family violence occurring in the region, and the threat to members of the community. Stakeholders within the criminal justice system consistently reported that domestic and family violence is the most common and pervasive type of offending within the region.

NQ Domestic Violence Resource Service (NQDVRS) is a service currently operating in the region. Their mission is to provide information, support and referrals for persons affected by domestic and family violence. NQDVRS also provides assistance with Domestic & Family Violence Protection Order Applications and Variations as well as providing community education on domestic and family violence.

A dedicated crisis accommodation centre would be an incredibly valuable tool for local stakeholders seeking to combat domestic and family violence in the Mount Isa region. By providing a space with adequate physical security, stakeholders can elevate their existing work in protecting victim's safety, by placing physical barriers between victims and perpetrators.

4.9.3 Commerciality

The construction of new domestic and family violence accommodation is unlikely to have a large direct economic impact outside of the construction phase, as such a facility is unlikely to be a revenue generating endeavour. The facility is likely to be administered by a not-for profit or for purpose enterprise. Despite this, there are indirect benefits to be gained from assisting victims of domestic and family violence, who may under different circumstances be contributing members to the economy where they in a position of safety to do so.

Deliverability

There are some relevant case studies that demonstrate the delivery costs and timeframes associated with specialised domestic and family violence accommodation:

- **Mossman, Queensland** - In 2023, the Queensland Government announced \$2.2 million in funding for a domestic and family violence service in Mossman to open a new shelter. This facility will provide safe and secure accommodation for up to two families at a time. At the time of announcement the Minister for Justice and Minister for the Prevention of Domestic and Family Violence noted that demand for domestic violence homelessness specialised services has risen 58% since 2017.⁷⁹
- **Penrith, NSW** - The NSW Government issued a funding grant of \$7.8 million in 2023 for a new refuge supporting women and children affected by domestic, family and sexual violence in Penrith. The facility is expected to support up to 47 women and 93 children per year. The facility features 11 self-contained residential units comprised of a mixture of Core and Cluster crisis accommodation and rapid rehousing units for single women and women with children. The facility will be staffed to provide 24/7 support to residents. At the time of announcement, the NSW Minister for Women's Safety and the Prevention of Domestic Violence and Sexual Assault noted that 50% of women who apply to crisis shelters are turned away due to limited capacity.⁸⁰
- **Northern Beaches, NSW** - In mid-2023 construction commenced on a crisis accommodation facility in Sydney's Northern Beaches with the assistance of a \$6 million capital works grant from the NSW Government.⁸¹

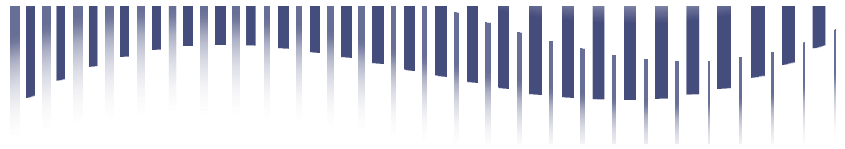
Dependencies

Domestic and family violence accommodation does not have any substantial dependencies on existing industries or other proposals under the Mount Isa Economic Transformation Strategy. Stakeholder consultation has confirmed that domestic and family violence is one of the most prevalent offending types in the Mount Isa

⁷⁹Minister for Justice and Minister for the Prevention of Domestic and Family Violence - Media Release December 2023 - <https://statements.qld.gov.au/statements/99280>

⁸⁰ NSW Government - New Domestic Violence Refuge to Support Women and Children Opens in Western Sydney - <https://dcj.nsw.gov.au/news-and-media/media-releases/2023/new-domestic-violence-refuge-to-support-women-and-children-opens.html>

⁸¹ Northern Beaches Advocate - Women's shelter receives funding - <https://www.northernbeachesadvocate.com.au/2023/08/03/womens-shelter-receives-funding/>



community, and is damaging the social cohesion that all stakeholders agree should be a goal for the community. Section 4.7.1 has clearly outlined evidence for demand for a facility of this nature in the Mount Isa region, which would serve as a protective factor to instances of domestic and family violence.



5. Implementation Plan

5.1 Purpose

The below implementation plan is to serve as a roadmap for executing projects under the Critical Infrastructure Strategy. Its primary purpose is to outline next steps, expected resources, timelines and responsible parties to allow MICC to reach its strategic objectives. The actions outlined in this implementation plan will also provide MICC with preliminary milestones to measure progress and hold relevant stakeholders accountable to project development. Where appropriate, the implementation plan outlines potential partnerships that may lead to an effective delivery model for the relevant project. The implementation plan should not be considered an exhaustive list of project management tasks, as further investigative work may be required on a project-by-project basis. Many of the projects profiled in this report are large, complex and costly initiatives which will require their own detailed feasibility analysis. Not all actions are sequential, and many of them can be undertaken in parallel as part of the same scope of works of concurrent scopes of work to achieve the most efficient outcome.

5.2 Implementation Plan

Project	Status	Actions	Approximate funding	Key stakeholders	Project owner
Rail access regulatory changes / subsidies	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: Council to work with QR and TMR to conduct thorough market analysis to understand the current state of rail transport for goods, including infrastructure, capacity and usage patterns. This assessment should identify key barriers that prospective users face in utilising rail transport and evaluate the potential demand for subsidised services. Action 2: Council to work with QR and TMR to seek stakeholder input to inform scheme design. Engaging with QR, rail freight companies and prospective users of rail infrastructure is a critical step towards ensuring that a subsidy scheme or regulatory change meets industry needs. Once this input is gathered design decision can be made regarding discount on rail transport rates, grants for infrastructure improvements, financial incentives for mode shift or other alternative mechanisms. Action 3: Council to advocate for funding and legislative support for the program through state government stakeholders. Legislative support will be required to authorise the subsidy or 	The 2019 subsidy scheme for the Mount Isa line required an annual investment of \$20 million. This can be considered a baseline estimate for future subsidy schemes.	<ul style="list-style-type: none"> Queensland Rail MICC Aurizon Martinus Rail Glencore and Resources sector Incitec Pivot North West Phosphate Agriculture sector MITEZ CRCNA 	TMR



Project	Status	Actions	Approximate funding	Key stakeholders	Project owner
		<p>legislative changes and ensure its legal / financial backing.</p> <p>External assistance can be engaged to work with Government on legislation design to expedite the process.</p>			
Northwest Queensland Correctional Precinct	Demand analysis / market sounding	<p>Actions 1 to 3 can be undertaken as a single scope of works in a business case process.</p> <ul style="list-style-type: none"> Action 1: Council to work with QCS to conduct market sounding through an options analysis and/or business case to determine the necessity and scope of the new correctional centre. This should include analysis of current prison capacity, prisoner demographics, projected population growth and crime / sentencing trends. Action 2: Council to gather support from key stakeholders including Departments in the criminal justice system (QCS, QPS and DJAG) and from political stakeholders including State MPs and the Minister for Corrective Services. Action 3: Council to work with QCS to develop a detailed project plan which includes scope, timelines and budget. This plan should include relevant construction inputs, including potential site selection and timeframes. This Plan should also include staffing and operational requirements for the facility, as well as comprehensive analysis of project risk and associated mitigation strategies. Action 4: Council to identify and secure funding sources to ensure the project is financially viable. Constructing a large-scale correctional centre is a costly endeavour and will require significant commitment from the State Government, which again relies on effective engagement with key stakeholders. Action 5: Council to initiate early-stage community engagement and communication to keep local residents informed on project objectives and options, and address any concerns to build support for the project. There are likely to be a variety of concerns 	For a large scale adult correctional centre the approximate funding is \$850 million, this can be considered the maximum required funding, with lower scale options likely to be significantly less.	<ul style="list-style-type: none"> • QCS • QPS • DJAG • Minister for Corrective Services • Member for Traeger • MICC 	QCS



Project	Status	Actions	Approximate funding	Key stakeholders	Project owner
		identified by members of the community, early transparent communication is critical to mitigating this risk.			
CopperString 2032 (incl. Northwest and Southern Spur)	Delivery	<ul style="list-style-type: none"> Action 1: Council to continue engagement with Powerlink and DSDI regarding ongoing investigations of the Southern Spur for CopperString 2032 and associated impact on the Mount Isa region. Action 2: Powerlink to conduct a detailed feasibility study on the proposed Northwest Spur of CopperString 2032 to identify prospective customers, and infrastructure development required to support the proposal. The Northwest Spur has not been brought to Powerlink for consideration and will require detailed technical and financial analysis before progressing to this stage. 	Based on existing project costs, further development of CopperString 2032 is expected to require approximately \$4.5 million per kilometre in funding.	<ul style="list-style-type: none"> Powerlink DSDI MICC Resources sector Agriculture sector Manufacturing sector MITEZ CRCNA Member for Traeger 	<ul style="list-style-type: none"> Powerlink
Residential rehabilitation centre	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: Council to engage with Government stakeholders in the Mount Isa region (QPS, QCS, DJAG, Queensland Health) to inform the need and referral pathways for facility. Action 2: Council to seek or allocate funding to conduct a market scan/sounding exercise to consider potential interest in delivery and operations of a residential rehabilitation facility. Action 2: Council to engage with Government stakeholders in the Mount Isa region (QPS, QCS, DJAG, Queensland Health) to inform design and referral pathways for facility. This will also assist in identifying the breadth of social benefits to be realised by the facility. 	Based on state government funding provided to recent facilities in Cairns and Bundaberg of a similar nature, an indicative investment cost is approximately \$15 million.	<ul style="list-style-type: none"> MICC Queensland Health QCS QPS DJAG APDC Mount Isa Salvation Army 	MICC
Tyre recycling facility	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: Council to seek or allocate funding to conduct a market scan/sounding exercise to consider potential interest in delivery and operations of tyre recycling facility and potential supply. Action 2: Council to identify through market scan/sounding the scope and type of facility demand and downstream uses for byproducts. 	In 2019 a comparable facility was constructed for \$12 million, however due to external economic influences the delivery cost in today's terms is likely to exceed this	<ul style="list-style-type: none"> MICC Private proponents 	MICC



Project	Status	Actions	Approximate funding	Key stakeholders	Project owner
		<ul style="list-style-type: none"> Action 3: Council to develop a business case to substantiate demand, assess potential options, and determine the financial viability and overall economic impact of the facility. As part of this business case an operating analysis should be undertaken to determine the most appropriate owner and operator structure for the project. Action 4: Council to conduct EOI process to firm up private sector interest, and the overall funding requirement based on responses for tenderers. 	value. A detailed price estimate is unable to be provided at this stage in project development.		
Public aged care facilities	Demand analysis / market sounding	<ul style="list-style-type: none"> Actions 1 to 4 could be undertaken through a single business case process. Action 1: Council to work with local stakeholders to conduct a needs assessment by collecting data on the local elderly population, their health needs and current aged care services in the region. This should involve surveys, interviews with local healthcare providers and demographic analysis of available population data. Action 2: Council to identify potential sites for the facility by conducting site visits and evaluating factors like accessibility, proximity to healthcare and social / community integration. Engage local planning authorities to identify suitable land or existing buildings for conversion. Action 3: Council to establish a project committee with representatives from MICC, healthcare providers, aged care experts as well as construction and project management specialists to oversee the projects early stage development and ensure the concerns of all interested parties are accounted for. Action 4: Council to identify potential funding pathways through public sources and assist identified proponents in seeking funding. Ensure that zoning approvals, environmental assessment and other regulatory concerns have been addressed prior to 	Based on the existing aged care provider in Mount Isa (Laura Johnson Home) an indicative funding rate of approximately \$230k per bed is expected.	<ul style="list-style-type: none"> MICC Laura Johnson Home Injilinj Aged Care Facility Queensland Health 	MICC



Project	Status	Actions	Approximate funding	Key stakeholders	Project owner
		seeking project funding to reduce potential delays in project development.			
Mount Isa line upgrades	Business case	<ul style="list-style-type: none"> Action 1: Council to work with QR and TMR to seek an updated assessment of the existing rail line to identify performance and resilience issues including track conditions, signalling and other electronic systems and supporting infrastructure. Action 2: Council to work with QR and TMR to conduct an options analysis / business case to analyse the potential benefits of an upgraded rail line such as increased capacity, improved safety and resilience to natural disasters. The study should include cost estimates, potential funding sources and an assessment of environmental impacts. Action 3: Council to form an internal project committee to centralise project development and advocacy efforts to relevant state government stakeholders. In addition to engaging with the state government this group should establish connections with rail operators and industry experts, prospective rail line users and engineers / project managers with the expertise to physically deliver on rail infrastructure upgrades. 	An estimated cost for this project is unable to be provided due to the large degree of variance in possible project works, from minor resilience upgrades to complete redevelopment of large sections of the Mount Isa line.	<ul style="list-style-type: none"> Queensland Rail MICC Aurizon Martinus Rail Glencore and Resources sector Incitec Pivot North West Phosphate Agriculture sector MITEZ CRCNA 	TMR
Mount Isa TLC	Business case, focusing on demand analysis	<ul style="list-style-type: none"> Action 1: Council to facilitate the update of financial and economic analysis provided in the 2020 TLC Business Case commissioned by MICC to account for cost escalation, more detailed demand analysis and incorporation of any new design features / scope (such as vehicle maintenance and/or EV charging/ hydrogen fuelling aspects), and to confirm that costings remain relevant. Action 2: Council to conduct a broad range of stakeholder consultation and/or an EOI process with the purpose of identifying a foundation customer for the facility, to ensure that the facility can be operationally potential economic benefits are maximised, and demand for the facility can be maintained. 	Cost estimates in the Business Case ranged from \$17 million to \$60 million in 2020 depending on the scope and scale of the facility. The net cost for the preferred delivery option identified in the 2020 TLC Business Case was approximately \$4.7 million after accounting for revenue of land sales and council rates.	<ul style="list-style-type: none"> MICC Glencore and Resources sector Incitec Pivot North West Phosphate Agriculture sector MITEZ CRCNA DSDI DTMR 	MICC



Project	Status	Actions	Approximate funding	Key stakeholders	Project owner
		Entering into early commercial arrangements with potential users is critical for the progression of the Project.			
Domestic violence accommodation	Demand analysis / market sounding	<ul style="list-style-type: none"> Action 1: Council to engage with Government stakeholders in the Mount Isa region (QPS, QCS, DJAG, Queensland Health) to inform design and referral pathways for facility. In addition, Council should engage with NQDVRS as the domestic and family violence service provider for the region. Action 2: Council to work with State Government to identify potential sites for the facility by conducting site visits and evaluating factors like accessibility, proximity to services and social / community integration. 	Based on recent case studies for similar facilities an indicative investment requirement of approximately \$5-7 million is expected.	<ul style="list-style-type: none"> MICC QCS QPS DJAG Queensland Health Department of Child Safety NQDVRS Member for Traeger 	MICC

Appendix A: Critical Infrastructure Current State Report

Abbreviations

Abbreviation	Description
ARHEN	Australia Rural Health Education Network
DATSIP	Department of Aboriginal and Torres Strait Islander Partnerships
DSDI	Department of State Development and Infrastructure
EA	Environmental Authority
HRT	High Risk team
MICC / Council / the Council	Mount Isa City Council
MIWB	Mount Isa Water Board
NEM	National Energy Market
NQREZ	North Queensland Renewable Energy Zone
NWPS	North West Power System
QAL	Queensland Airports League
RREAP	Rural and Remote Education Access Program
WSS	Water Supply Scheme



A Introduction

A.1 Purpose

In October 2023, Glencore announced that it will close all copper mining operations including the underground copper mine and copper concentrator in Mount Isa, with intention to cease operations in 2025, due to low-quality ore. At least 1,200 direct jobs will be lost as a result of the mine closure, but without intervention it is estimated that further job losses in the order of 3,600 will result, which has the potential to halve Mount Isa's population. The closure calls into question the future of Mount Isa's 20,000 strong community, whose economy has been dependent on the large mining supply chain.

In response to the announced closures, the Department of State Development and Infrastructure (DSDI) announced a support package of up to \$50 million for mine workers and the Mount Isa community. Up to \$30 million will be allocated to accelerate development of resource projects in the North West Minerals Province over the next five years. Up to \$20 million, to be matched by Glencore, will go toward an economic structural adjustment package for Mount Isa and North West Queensland. A Mount Isa Copper Mine Closure Taskforce has been set up as a joint initiative between Mount Isa City Council (MICC or Council) and DSDI, which is undertaking a priority initiative to identify requirements to accelerate the diversification and transformation of the Mount Isa economy, focusing on six pillars; Energy, Tourism, Resources, Critical Infrastructure, Agriculture and Small & Medium Business.

The purpose of this report is to provide an outline of the current state of Critical Infrastructure in Mount Isa and surrounds. This report also aims to provide a baseline of essential information that will factor into any economic decision making with respect to future Critical Infrastructure projects. The report will also introduce some potential Critical Infrastructure opportunities, without providing an assessment on their viability at this stage. Further detailed analysis on shortlisted opportunities will be a feature of later stages of this engagement.



A.2 Project background

The Mount Isa Region is situated within North West Queensland, which covers an approximate area of 200,500 square kilometres or approximately 20 million hectares as illustrated in

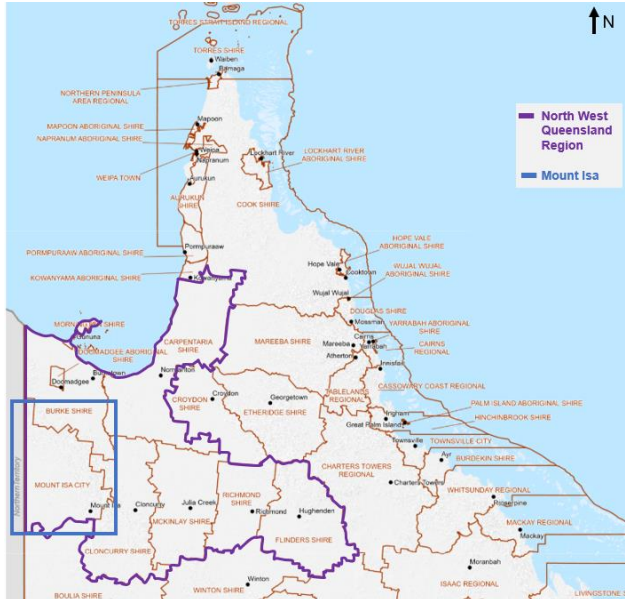


Figure 1.

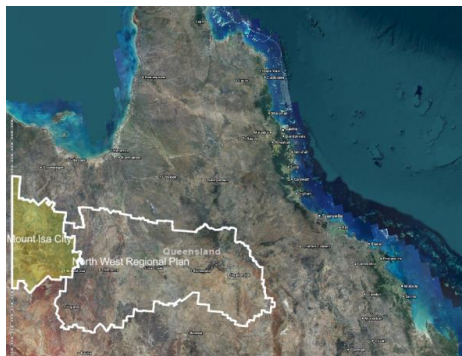


Figure 21: North West Queensland Boundary Map

The North West Region includes nine local government areas which include the following:

1. Flinders Shire
2. Richmond Shire
3. McKinlay Shire
4. Cloncurry Shire
5. Mount Isa City.⁸²

Mount Isa is a city in the Gulf Country region of Queensland. Mount Isa is situated on the traditional lands of the Kalkadoon people, who followed patterns of hunting and gathering, fishing and trade for many thousands of years before the arrival of the first Europeans. Kalkadoon craftsmen were famous for the quality of their stone implements, with hand-crafted

tools traded by the Kalkadoon people as far south as Birdsville. The town, as it is today, came into existence as a result of the vast mineral deposits found in the area. Situated in the Carpentaria Mineral Province, the city harnesses one of the world's richest mineral resources. Located 1,829km from Brisbane and 883km from Townsville

⁸² Queensland Government (2010). *North West Regional Plan 2010 - 2031*. Accessed at

[https://cabinet.qld.gov.au/documents/2010/may/north%20west%20regional%20plan/Attachments/nw-regional-plan-web-full\[1\].pdf](https://cabinet.qld.gov.au/documents/2010/may/north%20west%20regional%20plan/Attachments/nw-regional-plan-web-full[1].pdf)



(the closest major city), Mount Isa is the administrative, commercial and industrial centre for Queensland's North West, with a population of approximately 21,000 people.

B Strategic alignment assessment

B.1 Strategic context for the region

Mount Isa Mines, one of the biggest mining operations in Australia, has been the largest and most prominent mining operation in Mount Isa for many years, with Glencore's primary copper mine operating in Mount Isa for over 90 years. Copper is produced at Mount Isa Mines' Enterprise and X41 underground mines in Mount Isa, which form some of the largest networks of underground mine development in the world. Glencore also has zinc assets in and around Mount Isa, consisting of the George Fisher underground mine and Lady Loretta underground mine located 140 kilometres north-west of Mount Isa and operated by Redpath Australia.

B.2 Alignment with Glencore rehabilitation activities

The Queensland Government requires any mining operator to rehabilitate land that is disturbed by mining to a safe, non-polluting condition, able to sustain an alternative land use post closure. Continuous rehabilitation of mines is required via ongoing commitments through a mine's Environmental Authority (EA).

The rehabilitation work of Glencore will be closely managed by the Queensland Government and protections exist to ensure that the local community can use the land and surrounding areas safely in the future.

Glencore has initiated the development of a Social Transition Plan to address potential issues associated with the mine closure. The purpose of this plan is to develop a prioritised list of initiatives and opportunities to support the local community, workforce and businesses through the transition and into a longer-term future. Over the short-term, Glencore intends to engage a range of community stakeholders, through one-on-one meetings, workshops and public forums to gather insights, ideas and feedback to inform the plan.

Glencore's zinc-lead operations reportedly have a strong outlook for years to come, and will remain a fixture of the community and economy over the long term. Glencore is processing a range of changes to support continued operations, such as department restructures and adjustments to role accountabilities, operational and process changes to maintain safety, along with workforce reductions at different stages.

As at March 2024, Glencore has not published a Social Transition Plan, however has taken an active role in the work being completed by the Mount Isa Copper Mine Closure Taskforce, and working with consultants engaged under each of the six pillars.



C Existing critical infrastructure

This section aims to map existing critical infrastructure in the Mount Isa Region, across domains that are consistent with the State Government’s priority infrastructure categories. These categories will be used to inform the prioritisation of infrastructure projects in the latter phases of this project. Figure 1, below, provides an overview of some of the major infrastructure pieces across Mount Isa and the neighbouring regions. These are explored in further detail in their relevant categories.

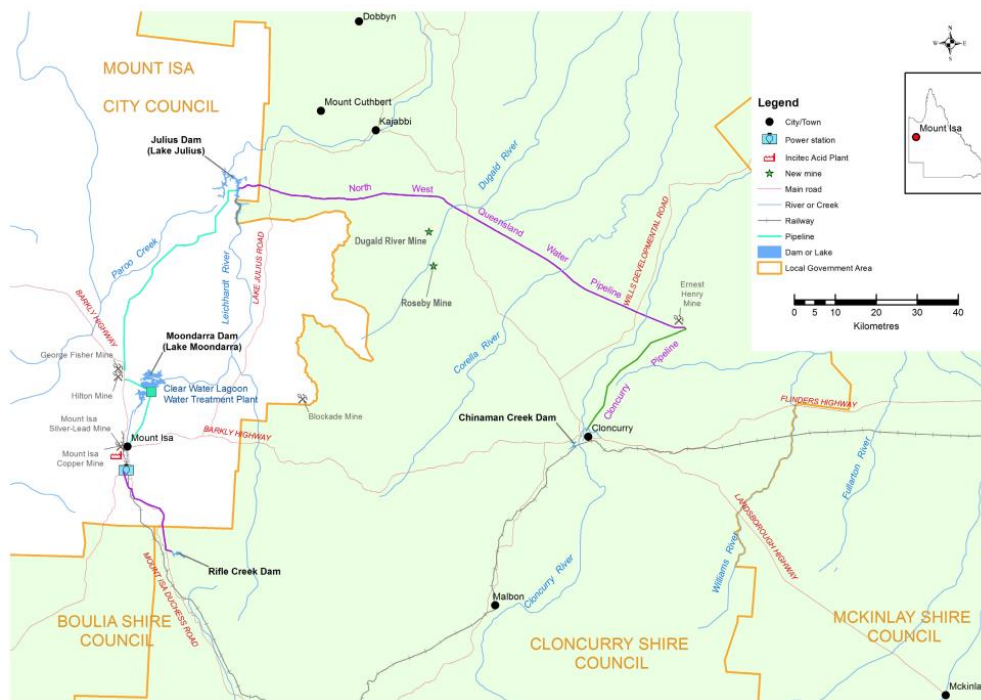


Figure 1: Critical infrastructure in the Mount Isa region (2019)

C.1 Water

Mount Isa’s water is supplied by two dams, each of which form a water supply scheme, the Moondarra Dam Water Supply Scheme and the Julius Dam water supply scheme⁸³. Safe, secure and reliable water supplies are critical for sustaining economic productivity in the area, as well as for the current and future well-being of the community.

There are two bulk water service providers operating in the area; Mount Isa Water Board and SunWater. Mount Isa Water Board is responsible for the supply of bulk treated water to the Council, Mount Isa Mines, and their industrial customers, and uses both Moondarra Dam and Julius Dam to provide these supplies. Mount Isa Water Board,

⁸³ Department of Natural Resources Mines and Energy - Mount Isa Regional Water Supply Security Assessment 2019.



Council and Mount Isa Mines Glencore work closely together and apply an adaptive management and operating regime to maximise water availability from the two water supply sources⁸⁴.

Lake Moondarra

Moondarra Dam is owned by Mount Isa Mines Glencore, located on the Leichardt river, approximately 16km downstream from Mount Isa township. The dam has a catchment area of 1070 km² and a storage capacity of 106 833 megalitres (ML). Construction of Moondarra Dam was completed by Mount Isa Mines in 1958 to supply water to the town and surrounding mines. There are a total of 26 300 ML per annum (ML/a) of medium priority water allocations available from the Moondarra Dam water supply scheme (WSS), including 1250 ML/a to cover distribution losses, and no high priority water allocations⁸⁵.

Since Moondarra Dam is located closer to Mount Isa and Mount Isa Mines, there are lower operational costs when accessing water from this dam. MIWB therefore typically operates the water supply system with preferential take from Moondarra Dam to supply its customers⁸⁶.

Lake Julius

Julius Dam is owned by SunWater and is also on the Leichardt River. It is located 74 km downstream of Moondarra Dam, approximately 70 km north-east of Mount Isa township. The dam has a catchment area of 3730 km² and a storage capacity of 107 500 ML. Construction of Julius Dam was completed by SunWater in 1976 to augment the water supply from the Moondarra Dam Water Supply Scheme. There are a total of 48 850 ML/a of high priority water allocations available from the Julius Dam WSS, including 1250 ML/a to cover distribution losses, and no medium priority water allocations⁸⁷.

Water is generally sourced from Julius Dam by Mount Isa Water Board only when water levels in Moondarra Dam fall below about 25% of its storage capacity, or when water quality issues may impede the use of water taken from Moondarra Dam. SunWater supplies water from Julius Dam to its own customers and to customers of its wholly owned subsidiary, North West Queensland Water Pipeline Pty Ltd. This subsidiary company supplies water to Ernest Henry Mining through the North West Queensland Water Pipeline and also supplies water to Cloncurry via the Cloncurry Pipeline⁸⁸.

Enabling infrastructure

The 13 kilometre Lake Moondarra pipeline connects the pumping station at Clear Water Lagoon to the Mount Isa treatment facility and is essential to the supply of 18 million litres of clean drinking water for local residents and 30 million litres of semi-treated water for industrial customers each day. The majority of this water pipeline is the original asset which was constructed by Mount Isa Mines in 1958, however in 2023 the Mount Isa Water Board invested \$2.8 million into updating a 1.2km section of the pipeline which had been historically prone to leaks and bursts⁸⁹. Mount Isa Water Board is also responsible for the pipeline and supporting infrastructure that connects water from Lake Julius to Lake Moondarra should the need arise.

The North West Queensland Water Pipeline provides water from Lake Julius primarily to Ernest Henry Mine, with some smaller mining industry customers along the way, at a rate of approximately 7000ML per year. This pipeline also supplies water to the township of Cloncurry. Water from Julius Dam is delivered to Cloncurry's water treatment

⁸⁴ Ibid.

⁸⁵ Department of Natural Resources Mines and Energy - Mount Isa Regional Water Supply Security Assessment 2019.

⁸⁶ Ibid.

⁸⁷ Ibid

⁸⁸ Ibid

⁸⁹ Mount Isa Water Board media release 27 March 2023.



plant via the Cloncurry Pipeline, which branches off the North West Queensland Water Pipeline. Cloncurry's water supplies from Julius Dam are currently provided through agreements between the Queensland Government, Cloncurry Shire Council and North West Queensland Water Pipeline Pty Ltd (a wholly owned subsidiary of SunWater). Under these agreements, the volume of water that Cloncurry can take from the pipeline is limited to 3.12 ML/day, 237.5 ML/quarter and 950 ML/a⁹⁰.

Water filtration

Mount Isa Water Board has installed state-of-the-art membrane filtration treatment plant to assure water quality provided to the city. MIWB continues to use Clear Water Lagoon to perform primary water treatment for supply to industrial customers and as pre-treatment before filtration. Raw water is pumped from Lake Moondarra into the Clear Water Lagoon (CWL) via the Lake Moondarra Pontoon Pump Station or from Lake Julius via the Fred Haigh and Lake Julius Booster Pump Stations. The water filtration process is as follows⁹¹:

- Water first enters the CWL flume where it runs over rocks and aquatic plants which aid in the initial filtration, aeration and oxygenation of the water.
- Water then enters the settling pond where much of the suspended solids and dissolved matter is filtered, adsorbed and absorbed by the jointed rush grasses and Hydrilla (Water Thyme).
- From the settling pond water enters CWL where it resides for about three weeks allowing contaminants to settle.
- The water is then pumped from CWL, via Col Popple Pump Station, to the Mount Isa Terminal Reservoir where it is chlorinated three times before it is delivered to Mount Isa Mines.
- Water for city is further treated using an advanced membrane filtration plant and transferred to Mount Isa City Council for distribution.

C.2 Energy

Due to its isolation, Mount Isa is not currently connected to the National Electricity Market (NEM). Most electricity in the region is supplied through a separate power transmission and distribution network known as the North West Power System (NWPS). The NWPS has limited electricity supply options and is predominantly sourced from gas-fired generation, resulting in more expensive energy costs for users compared to those connected to the NEM⁹².

Diamantina Power Station, owned and operated by APA, is responsible for servicing the needs of the Mount Isa region. It comprises 242 megawatt power generation from combined cycle gas turbines, plus 60 megawatt back-up from the adjacent Leichhardt Power Station open cycle facility. The region relies on a local distribution network with centralised gas-fired power generation and on-site generation for remote mining sites. Gas is supplied to the region via APA's Carpentaria Gas Pipeline⁹³.

⁹⁰ Department of Natural Resources, Mines and Energy - Cloncurry Regional Water Supply Security Assessment.

⁹¹ Mount Isa Water Board

⁹² Department of State Development - What is CopperString 2032?

⁹³ APA - Diamantina Power Station -



CopperString 2032

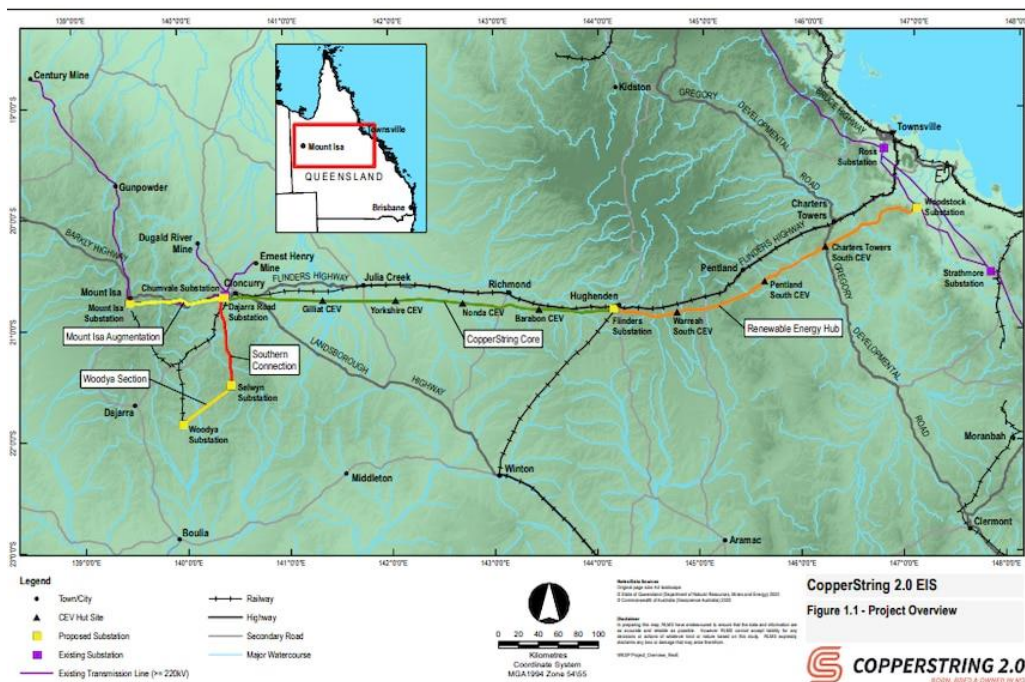


Figure 2: CopperString 2032 Project Overview

The CopperString 2032 project is a 1,100 km high-voltage electricity transmission line from Townsville to Mount Isa that will connect Queensland’s North West Minerals Province (NWMP) to the national electricity grid. The \$5 billion expanded project will include a 500-kilovolt (kV) line from Townsville to Mount Isa to connect the NWMP to the North Queensland Renewable Energy Zone (NQREZ), the largest renewable energy zone in the nation. This connection will form an essential part of the new Queensland SuperGrid transmission backbone to be delivered under the \$62 billion Queensland Energy and Jobs Plan. CopperString 2032 is the largest ever economic development project in North Queensland, and the largest expansion to the power grid in Australia.

CopperString 2032 will provide energy certainty to the region’s burgeoning critical minerals sector, delivering reliable, affordable and renewable power to the people, businesses and communities in the region. It will also allow the development of new renewable generation resources to be developed and the renewable power to be sold into the NEM.

Construction is expected to support 800 direct jobs over six years and thousands of new jobs in critical minerals mining, manufacturing and construction of renewables. CopperString, along with the new \$75 million Townsville critical minerals demonstration plant, will act as a magnet for investment into North Queensland, generating additional economic and employment opportunities for the region. The project will also serve as a catalyst for green energy projects within the NQREZ - Australia’s largest coordinated development of high-quality renewable energy production and storage projects, industry training sites and manufacturing.

The Queensland Government will build and own CopperString 2032, continuing the commitment made through the Queensland Energy and Jobs Plan that all the state’s transmission assets will be 100% publicly owned. Publicly owned transmission business Powerlink will lead work on the project and the Queensland Government will take ownership of the project from Queensland-based private company CuString.



It is estimated that the CopperString 2.0 project will make a significant contribution to the North West Queensland region, including unlocking more than \$500 billion in new critical minerals in North Queensland. CopperString is the most significant investment in economic infrastructure in North Queensland in generations. Unlocking affordable renewable energy and our critical minerals will benefit Townsville, Mount Isa and every town in between - unlocking thousands of jobs and billions in investment⁹⁴.

C.3 Transport



Figure 4: North West Region transport network

Mount Isa is equidistant from Darwin and Brisbane, with road and rail connections to the Port of Townsville 883 kilometres to the east. Mount Isa Airport also offers regular passenger services to Brisbane, Cairns and Townsville, and a number of towns in the region. The North West Region as defined by the Department of Transport and Main Roads is an area of approximately 307,803km². Despite the vast size of the region, it is home to only approximately 0.6% of the population of Queensland⁹⁵.

Roads

The Department of Transport and Main roads has identified the North West region comprising 1,024kms of the National Land Transport Network, which is a network of nationally important road and rail infrastructure links and

⁹⁴ Department of State Development and Infrastructure - What is CopperString 2032?

⁹⁵ Queensland Transport and Road Investment Program 23/24 to 26/27 - North West Region.



their intermodal connections. In addition the region also contains 2,551kms of other state controlled road networks⁹⁶.

Council is responsible for a total road network of 2,054kms, including 1,798kms of unsealed roads. MICC is responsible for an asset management plan which incorporates roads, stormwater drainage, kerb, pathways, traffic management assets with a current replacement cost of just over \$335 million⁹⁷.

Roads cater to most passenger and freight movements through the North West Queensland region. Major roads include the Landsborough, Flinders and Barkly Highways, and the Wills, Karumba, Burke, Gulf, Kennedy and Diamantina Developmental Roads. The road network is characterised by limited routes across an expansive area with few alternative route options. Average daily traffic volumes on the region’s highways range from less than 100 vehicles per day (on roads like Kennedy Developmental Road north of Hughenden) to up to 6,700 through Mount Isa. The proportion of heavy vehicles on major freight routes such as the Flinders and Barkly Highways can be up to 50 per cent of all road traffic. The relatively high proportion of heavy vehicles demonstrates the importance of the region’s highways for carrying freight⁹⁸.

Rail

The Mount Isa line consists of over 1,000 kilometres of track that extends from Stuart (near Townsville) to Mount Isa and includes the Phosphate Hill branch. The System is a single line, narrow gauge system with 46 passing loops and incorporates the balloon loops at Yurbi (privately owned), Phosphate Hill and Mount Isa (outer balloon at Mt Isa is also privately owned; only the inner balloon is open access)⁹⁹. The Mount Isa line connects with the North Coast line to link through to the intermodal facility at the Port of Townsville. The types of freight transported on the Mount Isa line include minerals concentrates, fertiliser, fuel, refined metals, cattle and general freight. The Inlander long-distance passenger service provides two services per week between Townsville and Mount Isa.

The Mount Isa line is of particular national interest as it runs along some of the world’s largest deposits of copper, lead, zinc, silver and phosphate rock. The region surrounding the Mount Isa Line produces 75% of Queensland’s non-coal mineral output¹⁰⁰.

Technical specifications of the rail line are below in Table 1¹⁰¹.

Crossing Loops	46	Gauge	Narrow (1067 mm)
Traffic	Circa 8 million gross tonne per annum	Axle Load	20 TAL
Track Speed	80 km/hr STU-HGD	Safeworking	Direct Traffic Control
	60 km/hr HGD-ISA/PHH	Balloon Loops	3
Weather Monitoring Stations	23	Sleepers	Steel/Concrete
Min Loop Lengths	1009 m	Bridges	>200
Level Crossings	204	Hot Bearing Detectors	4

⁹⁶ Queensland Transport and Road Investment Program 23/24 to 26/27 - North West Region.

⁹⁷ Mount Isa City Council - Roads, Signs and Footpaths.

⁹⁸ North West Queensland Regional Transport Plan 2019.

⁹⁹ Queensland rail - The Mount Isa Line

¹⁰⁰ Ibid.

¹⁰¹ Ibid.



Total Track	1,032 km single track	Dragging Equipment Detectors	25
Rail Size	41, 47, 50, 53 & 60 kg/m	Max Loop Length	1240 m
Train Control	Townsville Control Centre	Overload Detectors	4

Table 1: Technical specifications of Mount Isa rail line

Air

Mount Isa Airport is part of the Queensland Airport Limited (QAL) group of owned and operated airports, alongside Gold Coast, Townsville, and Longreach airports. Mount Isa Airport welcomed 228,000 passengers in 2023, facilitating more than 80 flights per week to five destinations across Australia, serviced by five airlines. The airport's passenger mix is predominantly business based, with a high frequency of travel due to the nature of the fly-in fly-out market. Flights mainly service passengers and their luggage, carrying a small amount of light freight, predominantly Australia Post letters and priority mail. The airport currently does not have an international airport designation and does not accommodate direct international flights¹⁰².

The local government-owned Cloncurry Airport is the second-largest in the region after Mount Isa. Other local government-owned airports supporting regional air services include Julia Creek, Richmond, Hughenden, Doomadgee, Burketown, Morningson Island, Karumba and Normanton. The region has two regulated air routes that are subsidised. These provide connections between:

- Townsville and Mount Isa with stops at Hughenden, Richmond and Julia Creek
- Cairns and Mount Isa with stops at Normanton, Morningson Island, Burketown and Doomadgee.

Marine

The North West Queensland region includes the Port of Burketown and the Port of Karumba. The Port of Burketown is a declared port, however, no commercial trade occurs. The Port of Karumba, located at the mouth of the Norman River, has operated primarily as an export port for lead and zinc from Century Mine. Century Mine (now owned by New Century Resources) re-commenced operations in August 2018 and exports material through the Port of Karumba. Annual dredging of the port has been reinstated and is anticipated to continue for duration of the mine's lifespan¹⁰³. The Port of Karumba also provides for general cargo, fuel and fishery products. Export of live cattle is a growing trade, but is restricted due to the constrained access of the shipping channel and the need to transfer cattle from barges¹⁰⁴. In FY 21/22 the total throughput of Karumba was 241,992 tonnes, with approximately 99.5% of this coming through exports¹⁰⁵.

Although not located within the region, the Port of Townsville is important to the region's supply chain. Linked to the region by road and rail links, the Port of Townsville exports the bulk of the regions commodities. The Port of Townsville is Northern Australia's largest container and automotive port, and the country's leading exporter of copper, zinc, lead, sugar, fertiliser and molasses¹⁰⁶. In FY22/23 the total throughput of the Port of Townsville was 6.8 million tonnes, with 2.1 million tonnes of import 4.9 million tonnes of export. The largest product category was

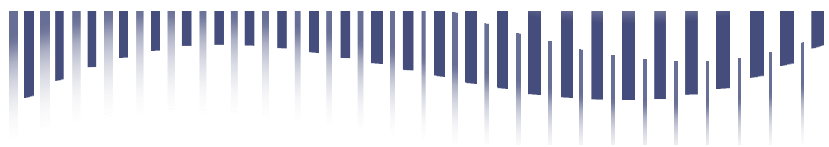
¹⁰² Queensland Airport League consultation

¹⁰³ New Century Resources - Century Mine Projects

¹⁰⁴ Department of Transport and Main Roads - Trade Statistics for Queensland Ports 2010-2015.

¹⁰⁵ Department of Transport and Main Roads - Trade Statistics for Queensland Ports

¹⁰⁶ Port of Townsville = Port Vision 2050



“dry bulk” which predominantly consists of cement, mineral concentrates, fertiliser, sugar and sulphurs. The dry bulk category accounted for 66% of total throughput, or 4,503,220 tonnes¹⁰⁷.

C.4 Health



Figure 5: North West Hospital and Health Service Map

Mount Isa Hospital is the main referral centre within the North West Hospital and Health Service. Patients from other facilities across the north west region who require specialist treatment and care are referred to either the Mount Isa Hospital or to other major hospitals within Queensland, including Townsville, Cairns and Brisbane.

Mount Isa Hospital is a Level 4 Specialist Service Base Hospital with a total of 80 beds. It is the referral hospital for the North West region, with remote country/ community hospitals at Doomadgee, Normanton, Mornington Island, Cloncurry, Julia Creek and health centres at Dajarra, Camooweal, Karumba and Burketown. Mount Isa also has a Royal Flying Doctor Service base providing rural retrievals, transfers and numerous primary health care activities including clinics at the health centres mentioned above. Mount Isa Hospital has undergone a redevelopment which included a new Emergency Department, new Outpatients Department, Mental Health (Outpatient) Unit, a Cancer Care Centre and a Paediatrics Unit.

The Emergency Department sees approximately 28,000 to 32,000 presentations per annum. An extremely varied mix of presentations gives clinical staff many opportunities to gain hands-on experience in procedural work and broad clinical experience. The hospital is the major referral centre for nine other remote health facilities and clinics in the region. Therefore, the health facility is the primary facility for the treatment of trauma including those caused by mining and farming accidents as well as road accidents. Medical staff will be exposed to a variety of medical, surgical, gynaecological and paediatric cases.

Specialist outreach patient services are managed from the hospital, which is the major hub for Telehealth services across the entire north-west service area, with five primary health care clinics and six hospital sites having access to 24/7 medical and nursing and midwifery support for the advice and management of lower risk emergency department presentations and other outpatient care. The Mount Isa Hospital provides ambulatory, sub-ambulatory

¹⁰⁷ Port of Townsville - Trade Statistics 22/23



and inpatient services predominantly in the areas of accident and emergency, cardiac, general medical, obstetrics and midwifery, paediatrics, mental health and many more¹⁰⁸.

Aged Care

The Australian Bureau of Statistics 2021 Census determined that 12.6% of the population in Mount Isa were greater than 60 years old¹⁰⁹. The aging population in the area is serviced by two main aged care facilities, being the Laura Johnson Home and Injilinj Aged Care Facility.

In 2012, Laura Johnson Home finalised a contract for the construction of a \$17 million dollar aged care facility to be able to provide a 75 bed nursing home to cater for respite and permanent residents. The project was funded by the Federal Government through the Rural and Regional Building Fund Grant. It operates as a not-for-profit and provides all residents with meals, room cleaning, laundry services, 24/7 nursing care, onsite doctors and assistance to attend appointments and access to basic essentials.

The Injilinj Aged Care Facility works closely with the Laura Johnson home and is able to support only 12 patients, the types of care that are offered are residential aged care, palliative care and non-dedicated respite. It provides short term accommodation to older people and younger people with disabilities who are from an indigenous background. They are only able to provide a very low number of permanent residential care for the community.

In addition to the aged care facilities, BlueCare also offers the Mount Isa Community Care Community Centre and the Mount Isa Respite Care Community Centre. Both of these centres provide experienced teams to develop personalised care plans including dementia management, in home respite, nursing care, transports and other care resources for the community.

C.5 Education and training

Mount Isa falls in the North Queensland education region which is further narrowed to Townsville and surrounds, and Mount Isa and surrounds. Within this region there are 81 primary schools and 15 secondary schools¹¹⁰, 10% of this total falls directly in the town of Mount Isa. Mount Isa is also home to James Cook University Centre for Rural and Remote Health, Mount Isa TAFE campus and alternative education and training pathway centres.

The Queensland Government offers the Rural and Remote Education Access Program (RREAP) which provides funding to rural and remote schools to improve the education outcomes and opportunities for their students who may be disadvantaged due to their geographical isolation. Out of the nine state schools in Mount Isa, eight are eligible¹¹¹ and receive funding to support projects that:

- Enhance their students' curriculum opportunities by providing access to services and programs supporting specific learning areas that cannot be sourced locally or incur additional costs compared to urban school communities.
- Supplement their school's access to information and communication technologies by extending the department's existing equipment and software provisions.
- Provide professional development to their staff and capability building opportunities for school community members to contribute towards improved educational outcomes for geographically isolated students.

¹⁰⁸ North West Hospital and Health Service - Mount Isa Hospital Profile.

¹⁰⁹ Australian Bureau of Statistics - Mount Isa, 2021 Census All persons QuickStats

¹¹⁰ Teach Queensland - North Queensland Region

¹¹¹ Queensland Government, Teach - Rural and Remote Education Access Program (RREAP)



There are also two education programs that fall under the RREAP that eight out of the nine state schools in Mount Isa are eligible for. They are:

- The Rural and Remote Arts Education Program that is offer by The Queensland Art Gallery in partnership with the Gallery of Modern Artwork, it provides an opportunity for rural and remote students and staff to engaged with the arts. It includes 3 learning experiences for schools and communities, including:
- Rural and Remote Art as Exchange—comprising workshops with arts educators, student workshops, visiting artist in residence workshops and cultural immersion programs for arts educators.
- Design Tracks—a residential program for Remote First Nations students.
- Kids on Tour arts curriculum boxes—arts resources delivered to small rural and remote schools along with digital resources to support a rich learning experience for Early Years students.
- The HarvestED Agricultural student program that is offered by The Department of Education, Queensland Virtual STEM Academy and Asia Education foundation that gives opportunities for rural and remote students to engage with the agricultural industry. Students join together as a virtual community and also meet face-to-face for workshops and to share the outcomes of their investigations which explore the agricultural and intercultural connections between local needs and global solutions.

Schools

Mount Isa has nine state school campuses, four catholic schools and one special education school. The primary and tertiary education systems are supported by the Centre for Learning and Wellbeing, which was established to provide professional learning and capability development for teachers and school leaders, while also supporting the wellbeing of staff and offering the facilitation of inter-agency support for students and their families.

School Name	Years Offered	About the School
Barkley State High School	Prep - year 6	The school has a student population of approximately 440 students, they also provide an early childhood developmental program for children from birth to prep and the current enrolment for this program is 20.
Mount Isa Central State School	Prep - year 6	The total enrolment for the year of 2022 was 251 students.
Happy Valley State School	Prep - year 6	The total enrolment for the year of 2022 was 394 students.
Healey State School	Prep - year 6	The total enrolment for the year of 2022 was 189 students.
Sunset State School	Prep - year 6	The total enrolment for the year of 2022 was 276 students. Indigenous student population is 80% of the total school population, with the remaining 20% of students families from places like the Philippines, Fiji and South Africa.
Townview State School	Prep - year 6	The total enrolment for the year of 2022 was 175 students.
Mount Isa School of the Air	Prep - year 10	The total enrolment for the year of 2022 was 176 students. It is 1 of 7 Schools of Distance Education in Queensland.
Spinifex Junior and Senior School	Junior: year 7 to year 9 Senior: year 10 to year 12	The total enrolment for the year of 2022 was 962 students. They also have a residential campus that houses all the boarding students.
St Joseph's Catholic Primary	Primary	The total enrolment for the year of 2022 was 308 students.



School Name	Years Offered	About the School
St Kieran’s Catholic Primary	Primary	The total enrolment for the year of 2022 was 157 students.
The Good Shepherd Catholic College	Year 7 - year 12	The total enrolment for the year of 2022 was 417 students.
Mount Isa Flexible Learning Centre	Year 7 - year 12	The total enrolment for the year of 2022 was 39 students. Young people over 15 years are also offered accredited learning options from within the FLC or Mount Isa TAFE
Mount Isa Special School	Ages 5 - 18	The total enrolment for 2022 was 27 students, these students may have an intellectual impairment, may fall within the Autistic Spectrum Disorder, have a vision, hearing and/or physical disability. The school is coded as a primary and secondary school and has a Speech Therapist, Occupational Therapist, Physiotherapist and specialists in vision and hearing as additional support.

Figure 22: Mount Isa State Schools and Information

TAFE

TAFE is the largest provider of post-secondary education in the state of Queensland and the TAFE campus at Mount Isa offers education and training in allied health, trades, early childhood education and care, and skills for education and employment. The campus facilities include a construction workshop, metal fabrication facilities, specialised automation and diesel fitting, and fitting and machining workshops. The campus offers qualifications, apprenticeship training and TAFE at school programs and also offers programs for specific groups such as those with disabilities, the unemployed and those from non-English speaking backgrounds.

University

James Cook University has their Centre for Rural and Remote Health in Mount Isa, it was established in 1997 as a centre for population health, education and research. It creates access to health education for the remote west region of Queensland and the centre provides lecture rooms, research facilities, video conferencing facilities, computer laboratory, procedural skills laboratory and a growing health services library.

The centre is nationally networked through the Australia Rural Health Education Network (ARHEN) and has built strong partnerships with the Australian Indigenous Allied Health Association, local councils, local hospitals, and many regional private practices and providers.

Alternative Education Pathways

Mount Isa has two registered training organisations for alternative education pathways, Krause Health and Safety, and Martyr Training Centre. The 2021 Australia Bureau of Statistics census determined that 23.1% of people aged 15 years and over in Mount Isa have attained a certificate level 3 or 4¹¹². They also determined that for people aged over 15 in the Mount Isa area, two out of the top three occupations were technicians and trade workers, and machinery operators and drivers. These statistics outline the economic importance of the RTOs in the Mount Isa area.

Martyr Training was first established in 2005 and is locally owned and operated and is a Supply Nation registered organisation that focuses on training in high risk, transport and logistics, mining, resources and infrastructure, business, and agriculture. The Queensland government has recognised that there are labour and skills shortages, Martyr Training offers a User Choice program in conjunction with the Commonwealth Apprenticeships system, it

¹¹² Australian Bureau of Statistics - Mount Isa, 2021 Census All persons QuickStats



aims to provide funding aligned to the skills needs of industry and allows apprentices and trainees to enter into contracts with their employers to receive structured training to achieve national recognised qualifications. They also offer a certificate 3 guarantee and a skills checkpoint and training incentive.

Krause Health and Safety provides health, safety and training consultancy services to the Mount Isa and greater North West region. They offer nationally accredited in person and online training to industries such as mining, construction, health care, childcare and agriculture.

C.6 Social and justice

Court

In Mount Isa there are three courthouses, the Mount Isa Magistrates Court, Mount Isa District Court and Mount Isa Supreme Court. There are also two youth services being the Injilinj Youth Services, offering education, advocacy and primary health care to Aboriginal and Torres Strait Islanders between 15 and 25 years of age, and the Mount Isa Youth Justice Centre which supervises young people under 17 who are under court orders.

The Queensland Government reported that between 2020-2021 there were 1896 criminal lodgements in the magistrates, and 419 in the children's court which makes up 1.36% of the state total¹¹³.

Significant reforms are underway to create a stronger justice system, the Queensland Government announced the review into the experience of women across the criminal justice system which is to be undertaken by the Women's Safety and Justice Taskforce. They have established specialist DFV courts in 4 locations, one of those being the town of Mount Isa. There were 458 domestic violence related criminal lodgements which makes up 1.65% of the states total and 217 child protection criminal lodgements making up 3.41% of the states total reported by the Queensland Government for 2020-2021.

There is also the Mount Isa Domestic and Family Violence integrated response trial that works in partnership with local Elders through the Aboriginal and Torres Strait Islander Domestic and Family Violence Advisory Group to ensure culturally appropriate responses for Indigenous victims and their children. Members of the advisory group are also Murri Court Elders, an Indigenous justice program run by the Magistrate Courts. As a result, these Elders have a deep understanding of traditional and community justice systems and referral pathways for local domestic and family violence offenders. The Mount Isa trial has also formed a greater focus on the potential linkage between domestic and family violence services and Aboriginal and Torres Strait Islander justice programs. The partnership was facilitated by and receives ongoing support from the Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts (DATSIP). In developing this partnership, DATSIP is helping to ensure the DFV Integrated Service Response in Mount Isa and surrounds is culturally inclusive and responsive to the needs of Aboriginal and Torres Strait Islanders peoples.

Police

Mount Isa sits in the Northern region for Queensland Police Services, the region goes from Townsville through to the Northern Territory border and includes the whole of Far North Queensland. In Mount Isa there is police headquarters and a community corrections office which allows for probation and parole reporting, the Department of Justice also has a High Risk Team (HRT) located in Mount Isa, which is one of nine teams within the state of Queensland. The HRTs are coordinated, multi-agency teams that collaborate to provide integrated, holistic, culturally appropriate safety responses for victims and their children who are at high risk of serious harm or lethality. HRTs consist of officers from agencies including specialist DFV services, police, health, corrections, housing, courts, child safety, youth justice, and Victim Assist Queensland.

¹¹³ Magistrates Courts of Queensland, annual report 2020-2021



The Queensland Police have reported a steady increase in crime rates in the Mount Isa area, in 2001 there were 7,388 offences reported and this increased to 13,250 offences reported in 2023¹¹⁴. The closest correctional facility is Townsville Correctional Centre location less than 900km away from the town of Mount Isa. In addition to this there is also the Lotus Glen Correctional Centre in Arriga and the Capricornia Correctional Centre in Etna Creek, both located less than 1400km away.

Mount Isa also has a recovery centre run by The Salvation Army, it operates as a 25 bed residential rehabilitation programs for people over the age of 18 who are experiencing drug and alcohol problems. Queensland crime statistics reported 1,008 drug related offences and 141 alcohol related offences in 2023.

D Mount Isa's infrastructure pipeline

D.1 Local, State and Federal infrastructure strategy

In order to build a strong, sustainable infrastructure pipeline it is necessary to align with the stated priorities of infrastructure strategy at the local, state and federal level. A high level summary of the infrastructure strategy at each level of government is provided below, and will be a critical factor in ranking infrastructure prioritisation in the later stages of the project.

Federal

The 2021 Australian Infrastructure Plan is a practical and actionable roadmap for infrastructure reform. It is intended to deliver infrastructure for a stronger Australia and support national recovery from the COVID-19 pandemic, as well as the bushfires, drought, floods and cyber-attacks that have tested our resilience in recent years.

The federal government's key areas for infrastructure reform and development, as outlined in the Australian Infrastructure Plan are:

- **Place-based outcomes for communities** – unlocking the potential of every location. Each place's identity informs its infrastructure needs and priorities, enabling investment that builds on a location's competitive strengths or reduces place-based disadvantage.
- **Sustainability and resilience** – balancing infrastructure outcomes in an uncertain future. Communities are able to resist, absorb, accommodate, recover, transform and thrive in response to the effects of shocks and stresses in a timely and efficient manner, enabling sustainable economic, social, environmental and governance outcomes.
- **Industry productivity and innovation** – facilitating a step change in productivity. An infrastructure industry that is highly productive, efficient, effective, prepared and confident. An environment where industry can sustainably respond to government objectives and vision with capability, capacity and resources in line with Australia's best interests.
- **Transport** – delivering an integrated network. Transport services should seamlessly connect people and goods across a vast continent. From door-to-door urban journeys to paddock-to-plate and pit-to-port supply chains, transport should be reliable and simple to use.
- **Energy** – enabling an affordable transition to a net zero future. Australia should export clean energy to the world from its high-tech, low-cost, low-emissions energy system. Empowered consumers and businesses can manage their own energy costs and participate in an efficient, reliable grid.

¹¹⁴ Queensland Police - myPolice Mount Isa, Queensland Crime Statistics



- **Water** – prioritising safety and security. Resilient, safe, secure and quality water supplies are available for all Australians and create attractive, liveable and resilient communities.
 - **Telecommunications and digital** – ensuring equity in an era of accelerating digitalisation. A fully connected Australia that offers resilient, superfast, equitable and wide coverage to everyone.
 - **Social infrastructure** – supporting economic prosperity and quality of life.
- Quality, accessible, future-focused, multi-purpose and economically valued social infrastructure should support a strong, healthy and prosperous nation and ongoing quality of life for all Australians.
- **Waste** – accelerating Australia's transition to a circular economy. Shifting from a linear waste management model to a circular economy has transformed Australia from a world-leading waste generator to building new industries as a recycling and remanufacturing powerhouse

State

The Queensland Government's infrastructure priorities are driven by the State Infrastructure Strategy 2022. The vision for the State Infrastructure Strategy is:

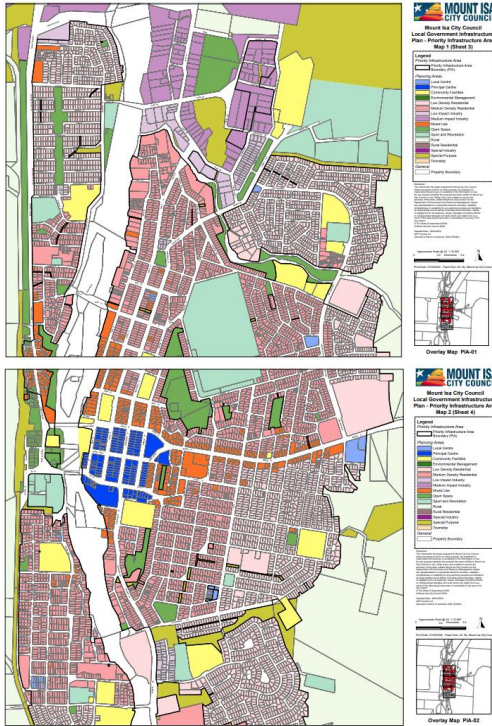
"We will drive collaborative state infrastructure planning to boost productivity, grow our economy and create jobs throughout the state. Infrastructure planning and delivery will leverage opportunities to improve the liveability of our communities and capitalise on innovation to build a strong, sustainable and resilient Queensland."

Similarly to the Federal governments key areas for infrastructure development and reform, the state government has outlined 10 priority infrastructure classes which they hope will assist in realising opportunities and addressing challenges for Queensland into the future.

- | | |
|--|---|
| <ol style="list-style-type: none"> 1 Cross-government - Common priorities across infrastructure classes, covering industry and productivity, governance, place-based planning and resilience and sustainability. 2 Transport - Roads, bridges, busways, railways, light rail, ports, airports, ferry connections, cycleways, shared paths, transport operational infrastructure, maritime infrastructure, shared mobility and other passenger transport solutions. 3 Water - Dams and weirs, desalination plants, water and wastewater treatment plants, and pipelines. 4 Education and training - Education facilities from early childhood education and care through to tertiary education and training. 5 Arts, culture, recreation and tourism - Art galleries, performing arts centres, cultural centres, museums, sporting fields/complexes, accommodation, attractions, walking trails, national parks and campgrounds. 6 Digital and innovation - Digital technology/infrastructure, mobile networks, fixed-line and satellite broadband services, data, digital infrastructure approaches (e.g. digital twin) and innovation precincts and places. | <ol style="list-style-type: none"> 7 Energy - Generation, transmission, distribution and storage infrastructure. 8 Health - Hospitals, primary health care centres, neighbourhood and community centres, ambulance stations and supporting digital technologies. 9 Justice and public safety - Detention centres (including correctional facilities, youth detention centres and police watchhouses), courthouses, and other police, fire and emergency, and disaster management services infrastructure. 10 Social and affordable housing - Social and affordable housing owned and/or managed by government and community housing providers and the private sector. |
|--|---|



Local



Figures 6 and 7: MICC Priority Infrastructure Zones

Council has developed a Local Government Infrastructure Plan (2020) to provide transparency regarding local government’s intentions for the provision of trunk (large scale multi-user) infrastructure, and ensure that it is planned in an efficient and orderly manner.

The Local Government Infrastructure Plan identifies five networks that provide essential services for development in the Mount Isa region¹¹⁵.

- 1 Water supply
- 2 Wastewater
- 3 Stormwater
- 4 Transport
- 5 Public parks and land for community facilities.

Mount Isa City Council has also analysed its comparative and competitive advantages from an enabling infrastructure and services lens, to inform the competitiveness profile in the Mount Isa Economic Development Strategy 2023-26. Table 2 highlights this self-assessment of Strengths and Attributes against Challenges and Constraints, and will be informative in evaluating and developing specific infrastructure projects.

¹¹⁵ Mount Isa City Council - Local Government Infrastructure Plan 2020



Strengths and Attributes	Challenges and Constraints
Established modern airport with existing scope for international trade destinations.	Prohibitive cost of flights.
Home to Royal Flying Doctor Service and School of the Air.	Road and rail transport infrastructure capacity constraints.
Direct rail access to Port of Townsville.	High rail freight transport costs.
Direct road access to Australia’s national highway system.	Communications infrastructure/services shortfalls.
Water reserves in Lake Moondara and Lake Julius.	Power supply constraints (not connected to the national grid) and high energy costs.
Quality pre-schools, primary and secondary schools	Water infrastructure capacity constraints and costs.
Tertiary training through various RTOs, TAFE Queensland, Mount Isa Country Universities Centre and JCU’s Centre for Rural and Remote Health.	Housing construction/development costs.
Regional health care, government service, retail, and transport and logistics hub.	Land tenure complexities (Native Title).
Sports precinct (Sports Parade) with scope for improvement.	Tourism infrastructure (e.g. accommodation, signage) and visitor servicing shortfalls.
Untapped/under-developed residential and industrial land.	Recreational and sporting facilities standards shortfalls.
	Community services shortfalls (e.g. child care).
	Access to university courses.
	Underutilised tertiary training facilities (TAFE).
	Specialist health care skills and services shortfalls.

Table 2: Strengths and challenges of Mount Isa enabling infrastructure



E Infrastructure pipeline

Table 3, below, outlines significant infrastructure projects that are either in planning or delivery stages across Mount Isa and the broader North West region¹¹⁶¹¹⁷.

Federal				
Infrastructure category	Project name	Description	Timeline	Impact rating
Transport	Mount Isa to Rockhampton corridor upgrade	Targeted upgrades to the Landsborough Highway, the Capricorn Highway and surrounding state and local roads	Long term	High
Transport	Roads to Recover program (X7)	The Roads to Recovery Program supports the construction and maintenance of the nation's local road infrastructure assets, which facilitates greater accessibility and improves safety, economic and social outcomes for Australians. There are seven projects on local roads in the Mount Isa region which fall under this program of work.	Various	Low

State				
Infrastructure category	Project name	Description	Timeline	Impact rating
Education and training	Growth planning	Undertaking growth planning at four schools in the north and western regions	Medium term	Low
Education and training	Playground upgrade	Upgrade of playgrounds at 10 schools in North and North West Queensland	Medium term	Low
Education and training	Amenities upgrade	Spinifex State College - Senior Campus amenities upgrade	Short term	Low
Education and training	Security fence	Spinifex State College - Student Residential security fence	Short term	Low
Social and justice	Residential accommodation	Queensland Police Service residential accommodation	Short term	Medium
Water	Lake Julius access road	Addressing recurring damage to Lake Julius access road and assessment of other road assets to rectify or upgrade as necessary, to ensure fit for purpose condition	Medium term	Low

¹¹⁶ Department of Infrastructure, Transport, Regional Development, Communications and the Arts - Infrastructure Investment Program.

¹¹⁷ Department of State Development and Infrastructure - Queensland Infrastructure Pipeline.



Water	Terminal Reservoir filtration membrane modules options	Completion of staged replacement of the filter membranes at Mount Isa Terminal Reservoir	Medium term	Medium
Water	Fred Haigh pump station electro-mechanical overhaul	Continued renewal of high-voltage yard and electro-mechanical equipment at Fred Haigh Pump Station	Short term	Medium
Water	Second pathogen disinfection system	Installation of new ultraviolet disinfection system as second pathogen barrier for the potable water supply to Mount Isa City Council	Short term	Medium
Water	Lake Julius power pole replacement	Replacement of old timber poles and cross-arms of the Lake Julius 66kv power line with bushfire resistant materials (concrete and steel)	Short term	Low
Social and justice	Mount Isa Diversion Centre upgrade	Upgrade to Mount Isa's Diversion Centre as a prison alternative for public intoxication offences.	Short term	Low
Energy	CopperString 2032	A 1,100 km high-voltage electricity transmission line from Townsville to Mount Isa that will connect Queensland's North West Minerals Province to the national electricity grid.	Long term	High

Local ¹¹⁸				
Infrastructure category	Project name	Description	Timeline	Impact rating
Social and Justice	Materials Recovery Facility	The facility is designed to process kerbside recyclables from residential solid waste, select commercial and industrial waste, and certain materials, including cardboard, some metals and Container Refund Scheme containers, such as glass and plastic bottles and aluminium beverage cans.	Short term	Low
Social and justice	Centennial Place	Public space featuring green areas, public dining and shade.	Completed	Low
Energy	Energy-efficiency upgrades	Energy-efficiency upgrades to Council's infrastructure	TBC	Low

¹¹⁸ Local infrastructure projects were obtained from the MICC 2023-24 budget. For conciseness, only feature projects have been included in this table.



Transport	Renewal of sealed roads	Renewal of sealed roads in Mount Isa and Camooweal	TBC	Medium
Social and justice	Water-play facility	An upgrade to Mount Isa's Splashez Aquatic Centre	TBC	Low
Water	Stormwater renewals and upgrades	Renewal and upgrade of stormwater infrastructure	TBC	Low
Social and justice	Fishing pontoon for Lake Moondarra	A new fishing pontoon for Lake Moondarra	TBC	Low
Transport	Footpath renewal and upgrades	Renewal works, replacement and upgrade of CBD footpaths.	TBC	Low

Table 3: Mount Isa Federal, State and Local infrastructure pipeline

Short term = 1 - 2 years Preliminary impact rating = Scyne Advisory's preliminary assessment on an infrastructure projects ability to provide long term sustainable employment opportunities either directly (e.g. construction or operations) or indirectly (e.g. high impact enabling infrastructure). N.b. this rating is not indicative of merit for particular infrastructure projects.
 Medium Term = 3 - 5 years
 Long Term = 6 years +

F Advantages, barriers and gaps

This report offers an initial desktop analysis of the current state of critical infrastructure in Mount Isa and the North West, as well as providing an overview of the existing published pipeline for future projects across the three layers of Government. Establishing a robust picture of Mount Isa's infrastructure landscape is an important first step in identifying future development opportunities, gaps and priorities for infrastructure enhancements.

Mount Isa's role as the central hub for the growing North West region, both from an economic and social perspective, highlights the importance of a broader infrastructure portfolio. It is essential that Mount Isa's infrastructure not only supports its own population needs, but is also capable of servicing the needs of the wider region over the longer term.

Currently Mount Isa has ageing infrastructure assets across a number of critical categories, particularly Water, Transport, Education & Training and Health. A number of assets across these categories were constructed during the first peak of mining activity in the region, and are being targeted for enhancement through the current infrastructure pipeline.

This analysis acknowledges the existence of a strong pipeline of infrastructure projects in the region. The focus for this project is identifying and advancing projects that are likely to generate sustainable employment opportunities within the region, or contribute to such potential indirectly. Specific attention should be directed towards the Water, Transport and Energy sectors, as they are considered critical for stimulating economic development and ensuring the long-term sustainability of the region. The enhancement of these infrastructure components is expected to benefit not only Mount Isa and the North West, but the economic activity of the entire state.

In order to progress this work, consultation with relevant stakeholders is critical to gaining a real-world view of the needs of government, industry and other stakeholders as they relate to infrastructure development. It is expected that this engagement will create a more nuanced understanding of the infrastructure requirements of the region, which will be important in guiding the assessment of projects that would deliver future benefits.

Appendix B: Critical Infrastructure Stakeholder Findings Report



G Introduction

In October 2023, Glencore announced that it will close all copper mining operations including the underground copper mine in Mount Isa due to low-quality ore, with intention to cease operations in 2025. At least 1,200 direct jobs will be lost as a result of the mine closure and without intervention, it is estimated that a further 3,600 jobs could be lost which has the potential to halve Mount Isa's population. The closure calls into question the future of Mount Isa's 20,000 strong community, whose economy has been dependent on the large mining supply chain.

In response to Glencore's announcement, the Department of State Development and Infrastructure (DSDI) committed a support package of up to \$50 million for mine workers and the Mount Isa community. Up to \$30 million will be allocated to accelerate development of resource projects in the North West Minerals Province over the next five years. Up to \$20 million, to be matched by Glencore, will go toward an economic structural adjustment package for Mount Isa and North West Queensland. The Mount Isa Copper Mine Closure Taskforce was established as a joint initiative between Mount Isa City Council (MICC or Council) and DSDI, which is undertaking a priority initiative to accelerate the diversification and transformation of the Mount Isa economy, focusing on six pillars; Energy, Tourism, Resources, Critical Infrastructure, Agriculture and Small and Medium Business.

G.1 Purpose

Scyne Advisory has been engaged by MICC to develop the economic transformation strategy for the Critical Infrastructure pillar. The strategy has been informed by comprehensive stakeholder engagement to seek feedback from industry and government about the challenges and opportunities in the region, and where investment should be prioritised to address gaps and drive job growth and economic diversification. The purpose of this report is to provide an overview of the approach to stakeholder engagement, and the key outcomes and findings that have helped to inform the development of the strategy and prioritise future investment.

Please note that this Report will be updated as Scyne Advisory finalises the stakeholder engagement process.

G.1.1 Structure of this report

The report is structured as follows:

- **Stakeholder engagement methodology:** This chapter describes the approach to identifying, prioritising and engaging with stakeholders.
- **Stakeholders engaged:** This chapter presents a list of stakeholders involved in the consultation and the status of engagement.
- **Summary outcomes:** This chapter provides a concise summary of the key themes shared during the consultation process which have informed the strategy's development.
- **Conclusions and next steps:** This chapter outlines the conclusions drawn from the stakeholder engagement process and the next steps in terms of investment priority and ideas generation for the Critical Infrastructure economic transformation strategy.



H Stakeholder engagement methodology

H.1 Approach

Engaging with industry and government throughout the strategy’s development is critical to its success. Stakeholder engagement must be clear and transparent to ensure the needs of Mount Isa are understood and supported, in turn allowing the prioritisation of investment and subsequent actions to be practicable and achievable to drive the desired changes. The approach to stakeholder engagement is set out in Figure 23.

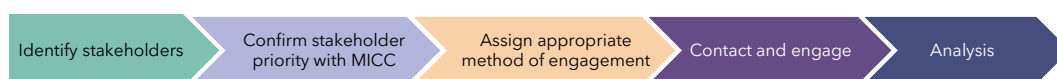


Figure 23: Stakeholder engagement approach

The stakeholder engagement process included:

- **Identify stakeholders:** The list of potential stakeholders was provided by MICC and further refined by Scyne Advisory.
- **Confirm stakeholder priority with MICC:** The engagement of each stakeholder was prioritised, informed by their relevance and importance to the Critical Infrastructure pillar, the desired outcomes from the engagement, and the likelihood of an effective and informative engagement.
- **Assign appropriate method of engagement:** Each stakeholder was assigned a type of engagement, ranging from formal face-to-face consultations to informal discussions or updates via email. This was generally determined by the allocated priority.
- **Contact and engage:** The approved stakeholder engagement participants were contacted by the appropriate party and, where feasible, engaged in a timely manner in line with the prioritisation of each engagement.
- **Analysis:** The outcomes of the stakeholder engagement were used to develop an understanding of the challenges and opportunities in the region and inform the development and prioritisation of potential initiatives.

H.2 Strategic approach to communication

The engagement approach developed for the Project has been informed by the International Association for Public Participation’s (IAP2) Spectrum. The IAP2 Spectrum identifies the level of participation that defines the public’s role in any engagement program. The IAP2 Spectrum has been used to determine the level and purpose of each engagement, and the most appropriate communication tools to be used.

Increasing impact on the decision					
	Inform	Consult	Involve	Collaborate	Empower
Public participation goal	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.



I Stakeholders

The stakeholders engaged during the strategy's development, their priority, method of engagement and status are included in Table 2. Please note Scyne Advisory is still engaging with stakeholders, and as such this list will be updated on completion.

Table 12: Stakeholders and method of engagement

Stakeholder	Contact	Priority	Method of engagement	Status
Mt Isa City Council	Acting CEO	(A) - Priority	In person	Ongoing
MITEZ	CEO	(A) - Priority	In person	Consulted
Mount Isa Airport	TBC	(A) - Priority	Online (MS Teams)	Consulted
Queensland Police Service	Officer in Charge	(A) - Priority	Online (MS Teams)	Consulted
Queensland Health	Northwest HHS	(A) - Priority	Online (MS Teams)	Consulted
Queensland Corrective Services	District Manager / Regional Manager	(A) - Priority	In person	Consulted
Mount Isa Water Board	CEO	(B) - Priority	Online (MS Teams)	Consulted
Department of Regional Development, Manufacturing and Water (DRDMW)	Manager - Water Planning and Science	(B) - Priority	Online (MS Teams)	Consulted
DRDMW	Manager - Townsville Manufacturing hub	(B) - Priority	Online (MS Teams)	Consulted
Department of State Development, and Infrastructure (DSDI)	Regional Director	(B) - Priority	Online (MS Teams)	Consulted
Aurizon	Aurizon General Manager for Bulk Business QLD and NSW	(B) - Priority	Online (MS Teams)	Consulted
Department of Transport Main Roads (TMR)	Projects Corridor Manager	(B) - Priority	Online (MS Teams)	Consulted
Department of Transport Main Roads (TMR)	District Manager	(B) - Priority	Online (MS Teams)	Consulted
QLD Rail	Senior Manager, Business Development	(B) - Priority	Online (MS Teams)	Consulted
Mount Isa Tourism Association	Chair	(B) - Priority	Online (MS Teams)	To be scheduled
Engagement with Energy workstream	Mott MacDonald	(B) - Priority	Online (MS Teams)	Consulted
Engagement with Resources workstream	Delta Pearl Partners	(B) - Priority	Online (MS Teams)	Consulted
Member for Traeger	Local Member	(B) - Priority	Online (MS Teams)	Consulted
Regional Development Australia North West Queensland (RDANWQ)	CEO	(B) - Priority	Online (MS Teams)	Consulted
Transbulk	CEO Logistics	(C) - Second round consultation	Online (MS Teams)	Consulted



Stakeholder	Contact	Priority	Method of engagement	Status
Wagner transport	Business Development Lead	(C) - Second round consultation	Online (MS Teams)	Contacted
Sun Water	General Manager Operations, North and Central Region	(C) - Second round consultation	Online (MS Teams)	Consulted
Department of Defence	TBC	(C) - Second round consultation	Online (MS Teams)	To be scheduled
Martinus	National Development Manager	(C) - Second round consultation	Online (MS Teams)	Consulted
APA	Business Development Manager	(D) - If required following workstream lead consultation	Online (MS Teams)	TBC
Glencore	General Manager Health, Safety and Environment	(D) - Following workstream lead consultation	Online (MS Teams)	Consulted
Cooperative Research Centre for Developing Northern Australia	Senior Project Manager	(D) - Following workstream lead consultation	Online (MS Teams)	Consulted
Watco	Director East West	(D) - If required following workstream lead consultation	Online (MS Teams)	TBC
Jemena	General Manager Policy & external Affairs	(D) - If required following workstream lead consultation	Online (MS Teams)	TBC
Incitec Pivot	General Manager Sales	(D) - If required following workstream lead consultation	Online (MS Teams)	TBC
Dept of Energy and Climate	Manager transformation energy	(D) - If required following workstream lead consultation	Online (MS Teams)	TBC
Powerlink	Project Engagement	(D) - If required following workstream lead consultation	Online (MS Teams)	TBC
Copperstring (Powerlink)	Executive General Manager, Major Projects	(D) - If required following workstream lead consultation	Online (MS Teams)	TBC
North West Phosphate	Managing Director	(D) - Following workstream lead consultation	Online (MS Teams)	Consulted
Port of Townsville	General Manager	(E) - Notified of outcomes	Notified via email	To be notified
NT Department of Infrastructure, Planning and Logistics	Logistics	(E) - Notified of outcomes	Notified via email	To be notified
Queensland Reconstruction Authority	Regional Liaison	(E) - Notified of outcomes	Notified via email	To be notified



J Summary outcomes

This chapter presents a summary of the stakeholder engagement conducted for the Critical Infrastructure pillar. To protect the confidentiality of the participants and the information discussed in the meetings, the content has been de-identified. The findings are summarised into categories, representing the key industries and sectors that align to the Critical Infrastructure pillar. Each section covers the challenges and opportunities expressed by stakeholders for that particular industry, including focus areas for investment prioritisation. This feedback has informed the development of a list of potential initiatives that can create jobs and support the transformation of the Mount Isa economy, while also aligning to community needs and the strategic objectives of Council.

This chapter includes:

- Community and liveability
- Health and social services
- Transport
- Energy and resources
- Water and agriculture
- Judiciary

J.1 Community needs and liveability

Stakeholders engaged expressed there is a strong interest from the community to stay in Mount Isa. Some mine workers are willing to transition to a new job, including in infrastructure delivery, to remain in their home and community. The importance of the economic transformation strategy was reiterated during several consultations, with the community engaged and happy to be involved in ensuring the success of Mount Isa. However, there was a consistent sentiment that infrastructure investment is required to improve amenity and liveability. Without investment in the community, new workforces will continue to choose fly-in fly-out (FIFO) over re-locating to Mount Isa, further exacerbating the challenges presented by the closure of the Glencore's copper mining operations.

Given that Mount Isa is identified as a service 'hub' for the North West, and the majority of stakeholders have aspirations for the expansion of the 'hub' concept, it is important that the city provides residents and visitors with quality services and amenities.

Some of the community needs and liveability challenges or gaps in the region identified during consultation include:

- **Housing supply and quality:** There is limited supply of quality housing or executive style housing, with most local homes being modest in nature and much of the stock being aged and weathered. This makes it less attractive for workforces to live in Mount Isa, choosing FIFO over finding a local home to buy or rent.
- **General town amenity:** CBD infrastructure is seen as aged and does not appropriately reflect Council's vision of "Making our good city great, through innovation, diversification and cultural enhancement". Ageing and poorly maintained city infrastructure was seen as a barrier to creating a sense of community pride and potentially limits opportunities for investment.
- **Childcare:** One stakeholder cited a lack of childcare options as a barrier to some parents being able to seek employment.
- **Tourism infrastructure and accommodation:** Tourism infrastructure is seen as dated and there is a lack of quality accommodation for visitors in town. Mount Isa hosts the largest rodeo in the southern hemisphere and poor infrastructure and accommodation may lead to less return visits by tourists or event holders over time. There is also considerable opportunity for expansion of cultural and outback tourism, however, there was a view that further enabling infrastructure would be required for this to be realised.



Opportunities for investment to meet community needs and improve liveability include:

- **Lifestyle blocks:** Increasing supply of lifestyle blocks may appeal to people wanting more of the country lifestyle while still being close to the city. A rural-residential land release and focus or requirement to build quality homes may increase the attraction of living near town. This would take advantage of Mount Isa's comparative advantage of being a beautiful rural location, with the services of a regional city.
- **Mixed use developments:** The recently developed CBD masterplan proposed a mixed-use development in the CBD with potential for accommodation, government offices, some retail on the ground floor and childcare to fill the gap in the region.
- **A program of works for town beatification:** Several stakeholders have suggested a program of small, shovel ready works to improve town amenity and liveability that can keep Glencore workers engaged until opportunities arise elsewhere, such as through initiatives resulting from the economic transformation strategy. Examples cited included improved streetscaping of the key routes into the city, such as from the Airport. Other ideas included family-friendly infrastructure to improve the amenity of particular parts of the city, such as walkways along Breakaway Creek, and communal infrastructure in more disadvantaged parts of town, such as facilities at the riverbed where groups are likely to continue to congregate.

While these opportunities are not major drivers of employment, investment to address the gaps and improve community amenity and liveability will be critical to ensuring that people will continue to work and live in the Mount Isa as it transitions to a diversified economy.

J.2 Health and social services

In terms of social infrastructure, stakeholders reiterated the importance of Mount Isa as a hub for the North West, with rural and remote residents relying on services in town, including North West Hospital and Health Service (HHS) at Mount Isa Hospital.

Some of the social infrastructure challenges in the region expressed by stakeholders include:

- **Failing primary care:** North West HHS has to pick up the gap left by rural and remote primary care, meaning that patients are presenting to the hospital with minor health issues and sickness, taking up essential service capacity. Demand pressures are exacerbated by populations from the Northern Territory coming into Mount Isa for treatment, without a service level agreement of patient transport scheme with the Territory Government.
- **Hospital infrastructure is aged and not fit-for-purpose:** Hospital infrastructure is run down and not fit-for-purpose:
 - There is insufficient capacity to meet demand, with the aged general medical ward having very limited bed supply.
 - There is no inpatient mental health facility or dry-out facility in Mount Isa, meaning that patients must use beds in the general ward, further limiting supply.
 - Renal dialysis treatment is a major gap in the region, with a high level of demand and patients being transferred to Townsville.
- **Transfer to Townsville:** As a result of the aged and not fit-for-purpose infrastructure, many patients are transferred to Townsville for treatment, adding to the costs of care for North West. This also creates poor social outcomes, and residents are treated away from home and do not have their support networks close by. This is particularly challenging for Indigenous communities. With around half of all patients being Indigenous, moving people off country for care has cultural consequences.
- **No public residential aged care:** There is no public residential aged care service in Mount Isa, with residents who cannot afford private services moving away from families and friends to Townsville for care. This problem will worsen in the short to medium term as the population expected to stay in Mount Isa ages.



- **Limited domestic and family violence support:** There is no accommodation or dedicated support service for people fleeing domestic and family violence.

Opportunities for investment in social infrastructure include:

- **Holistic approach to care:** North West HHS has an unfunded masterplan for the health precinct. Regional and rural communities are increasingly combining hospitals and primary care services which could be an opportunity to streamline and improve health care in Mount Isa. This will support the aging population that is expected to remain in Mount Isa despite the mine closure with holistic care and chronic disease / mental health management, placing less pressure on long-stay beds in the hospital system.
- **Treatment in region:** There is a clear opportunity to reduce health costs by investing in infrastructure and technology so that patients are treated in region rather than being transferred to Townsville. Infrastructure investment priorities could include:

Medical ward upgrade (generally medicine and surgery)

dedicated inpatient mental health facility

Renal unit upgrade

Residential aged care facility, which has the potential to create a considerable number of skilled and unskilled jobs.

Hospital in the Home (HITH) outreach service to care for people in community

- **Accommodation to support staff:** Additional supply and improved accommodation for hospital workers will help to attract and retain staff to meet demand and ensure a high level of care.

Some of these opportunities have the potential to create meaningful employment in the region while addressing critical social infrastructure and service gaps. As a hub for the North West, it is imperative that Mount Isa provides high-quality social services so that the level of care available in region is equal to that in metropolitan areas.

J.3 Transport

Given the region's abundance of minerals and mining operations, transport and logistics is a major industry in the North West with rail, road and air all essential to Mount Isa's operations. Transport industry stakeholders comprised 30 per cent of priority A and B stakeholders, with those consulted highlighting several gaps and opportunities for Mount Isa's diversification. Transport was also a popular topic for many other stakeholders, echoing its importance to the community and the significant reliance that the whole economy has on reliable road and rail.

Transport challenges in the region include:

- **Rail:** The volumes and demand transported on the Townsville to Mount Isa rail line are seen to be relatively stable, with tonnages unlikely to change significantly in the future. There is a QR Master Plan that may be updated, but tonnages are able to be accommodated within the current infrastructure profile, and smelter feedstock (e.g. acid) is seen to be a more significant determinant of future demand than the mine closure.

The key challenges for rail are:

Lack of investment: Many stakeholders expressed that there has been a historical lack of investment in the Mount Isa Line.:

- **Resilience and reliability:** As a result of limited investment, resilience and reliability are critical issues. During the wet season the line can be out of operations for months at a time, with the most recent event being four weeks in February 2024.
- **Operational limitations:** Historical lack of investment in the line has also created operational limitations. Double stacking of full-sized containers is currently not viable due to structural gauge limitations, several bridges along the route and the general quality of the line. Speed is also a



challenge, with a posted speed limit of 80 kilometres per hour, but most trains only reaching 30 to 40 kilometres per hour.

- **Freight flow:** Currently, more freight is flowing from Mount Isa to the Port of Townsville, meaning the majority of freight travelling West is empty. However, Glencore's future plans of importing concentrate for the smelter due to closure of mine would see additional half height containers travelling west, a practice which at present has not existed. Cement is another commodity that has the potential to travel west on rail rather than road.

Cost: The cost of freight is seen as a barrier to using rail, at almost two to three times higher than other lines in Queensland. Take or pay contracts are also challenging for junior mines that may have less reliable production.

- **Uncompetitive with road freight:** The cost of road freight is seen as more competitive than rail, meaning that heavy freight is often transported in trucks which impacts road conditions and results in greater maintenance requirements. For example, all fuel travels via road due to rail costs and the operational limitations described above, but has in the past been carried on rail.
- **Network access:** Some stakeholders expressed their view that there is a monopoly of below rail assets, while some argued there is also a lack of competition in above rail assets. While a small number of stakeholders did not believe there were any competition problems, some stakeholders expressed concern that the pricing combination of above rail charges and regulated below rail charges is unaffordable and creates a barrier to entry for smaller producers and mines.
- **Collaboration:** There a view from some stakeholders that there is limited collaboration in the supply chain, which is a barrier to creating efficiencies and driving innovation. The lack of connectedness between road and rail was cited, and the history of mines 'going it alone' with their own facilities (e.g. load outs) was seen as a barrier as it is viewed as a competitive advantage.
- **Road:** Some roads are not fit-for-purpose, with mine access roads often unsealed and only one lane, despite heavy traffic including B-Doubles and road trains. Stakeholders did not have a consistent view on who's responsibility it was to make road infrastructure improvements, with the State Government, Local Government and individual road users (mines) cited as potential contributors to future upgrades and an enhanced maintenance program.
- **Air:** There is limited capacity for additional aircraft at the Airport, particularly on the days that align to the FIFO schedule (Wednesday and Thursday). Mount Isa Airport has turned away tourism charters away in the past as there were no aprons available. This is also the case when the Airforce and/or VIP transport requires space, which is approximately four to five aircraft a month, disrupting regular commercial flight schedules. While not an infrastructure consideration, the high cost of commercial flights to Mount Isa was cited as a barrier to future growth of air services.

Opportunities for investment in transport infrastructure include:

- Rail:

Common user infrastructure: There has been considerable investigation into the feasibility of common user rail infrastructure in the region, such as the Transport and Logistics Centre (TLC). There was an argument that this centre could cater to road and rail transport activities, with previously proposed sites strategically located on highways with haulage exposure. Some stakeholders believe this may reduce barriers to entry, however, other stakeholders argued there is not enough demand and that existing assets are used by /available to multiple operators.

Double stacking: Enabling half/three quarter double stacking presents an opportunity to improve the efficiency of two-way travel. To achieve this, structural gauge would need to be improved and bridges avoided. There are three bridges west of Stuart (overbridges at Mingela, Charters Towers and Burra), and two bridges east of Stuart which are currently limiting double stacking. The three west of Stuart could be raised or the ground lowered at a reasonable cost to deliver efficiencies. If this was actioned,



there is an opportunity for freight to double stack from Mount Isa to Stuart and then go from Stuart to the Port via road.

Resilience measures: Most transport stakeholders said that investment in drainage and resilience measures were critical to the future use of the rail line. Some stakeholders mentioned that investment on maintenance and resilience measures has been decreasing over time, despite access charges remaining high.

Access subsidies: Many stakeholders said that rail access subsidies for junior mines would support production and economic growth. It was acknowledged that there are above rail operators in the region that provide an aggregate service to reduce costs for junior mines, and that trials have been run to reduce access charges for junior mines so that they establish operations.

Western rail: The rail line to Tennant Creek was also raised as an opportunity during consultations to increase western freight flow and 'unlock' access to resources and agricultural industry in the Northern Territory. However, some stakeholders noted this would be detrimental to Queensland freight and logistics industry, as freight may re-direct to the Port of Darwin instead of Townsville.

- **Road:** To improve safety and reduce consistent maintenance requirements, an obligation was proposed for all access roads to mines with a specific life to be sealed and two-way. The Flinders Highway was also highlighted as a key enabler in the region and should be maintained to ensure ongoing safety and efficiency. Other suggestions included assessing the viability of a state-controlled grader that could be deployed for re-grading on the dry season as part of an enhanced maintenance program.

Opportunities cited for road infrastructure enhancements included:

Improvement of connection of Northridge Road onto the Barkly Highway

Sealing of unsealed roads in general

Raising structures in flood-prone sections of the Flinders and Landsborough Highways

- **Air:** There is an opportunity to increase apron capacity at the airport to improve flexibility during high-demand periods. There was also a proposal for a flying school or helicopter school to be located in region to support local activities such as heli-mustering.

Transport is often enabling infrastructure for other opportunities to be realised. The stakeholder engagement confirmed that investment in transport in Mount Isa is crucial to economic transformation and diversification, and should be prioritised.

J.4 Energy and resources

As two of the five pillars being investigated by Council, energy and resources infrastructure will be key to Mount Isa's economic transformation. Therefore, being the Critical Infrastructure pillar, engagement with stakeholders on energy and resources needs focused on the supporting and enabling infrastructure for projects that could drive economic activity.

The key challenges for energy include:

- **Access:** Access to energy is essential to establishing new mining operating in the region. Junior mines are struggling to access cheap and reliable energy, and may wait until renewable energy projects are up and running to begin construction and operations.
- **Uncertainty:** Stakeholders indicated that the closure of the mine is compounded by the uncertainty and speculation that exists in the city about the future of other investments. There was a view that this could be somewhat counteracted with some positive announcements about alternative infrastructure investment in the city. Uncertainty was particularly referenced in relation to:



CopperString - despite being brought within the State Government's Queensland Energy and Jobs Plan, there is a heightened level of uncertainty about CopperString reaching Mount Isa which is creating a barrier to some projects progressing to delivery. Large mining projects need access to reliable and affordable energy to reach a final investment decision, and without CopperString, there was a view from some stakeholders that it may be more viable to wait for green energy which cannot be delivered in the short term.

Closure of smelter: While Glencore has committed to keeping the smelter open until 2030, its potential closure presents a supply chain challenge in the region, with the sulfuric acid by-product from its operations critical to several other operations. It was noted by some stakeholders that uncertainty about the future of smelting and speculation on whether or not the re-bricking effort required every five years would occur is impacting negatively on confidence.

Opportunities for investment in enabling infrastructure include:

- **CopperString spurs:** There is opportunity for two CopperString spurs in Mount Isa to support the construction and operation of several resources projects in the short term, otherwise, development may stall until green power is available (2030):

Southern spur (planned) which is planned to connect to Greater Duchess Copper Gold Project and Phosphate Hill Mine

Northern spur which would connect to the Eva Copper Project.

- **Pyrite furnace / sulfuric acid plant:** There is a clear opportunity to address the potential gap in sulfuric acid supply in the region and with a pyrite furnace/acid plant. This investment would drive a considerable level of direct jobs, both during construction and operations, and support the ongoing viability of several other industries that support Mount Isa's economy.

As a critical enabler of Mount Isa's current and future operations, investment in energy and resources will be key pillars of the economic transformation strategy.

J.5 Water and agriculture

Agriculture is also one of the five pillars being investigated by Council, with access to reliable water being a key enabler of this industry. Many stakeholders said there was not enough water supply and access to reliable water was a barrier to business development. However, it is understood there is sufficient water supply in the Gulf catchment which is regulated across three components:

- Future consumptive use: Including unallocated water reserves for general, strategic, infrastructure and Indigenous uses
- Existing consumptive use: Including supplemented allocations, un-supplemented licences and allocations, and water sharing - reviewing the allocation of water in this bucket presents the most opportunity to improve water access in the region.
- Non-consumptive use: Including environmental and flows and cultural values

The challenges for water and agriculture include:

- **Water quality and reliability:** There is ongoing underinvestment in water and wastewater infrastructure in region, which places water quality and reliability at risk. There are potential drinking water risks, created by deteriorating infrastructure and poor staff training.
- **Lack of skilled labour for water:** There is a lack of skilled labour in the region to complete water engineering works, which has resulted in the poor water infrastructure, quality and reliability.
- **Water cost:** Some stakeholders said that the cost of water is the main barrier to business, however, other stakeholders said that it was more about the understanding of the water market and product that is the issue.



- **Water entitlements:** Due to un-supplemented water being treated as a balance sheet asset, owners are unlikely to part with entitlements meaning that water often goes unused despite there being sufficient amounts and high demand. Licences create a book value and there is asset security associated with it that act as a disincentive to negotiation of alternative uses for spare water.
- **Access to un-supplemented water:** There is only a one-time harvesting licence cost to access un-supplemented water, however, land ownership or a commercial arrangement with the landowners (e.g., a mining licence) is required. This is a barrier for many agricultural producers in the region that lease their land from Council.
- **Evaporation:** Evaporation is key challenge, with a considerable amount of water supply lost as a result.

Opportunities for investment in enabling water infrastructure include:

- **Evaporation control measures:** There are several approaches to reducing evaporation, including evaporation curtains and deepening measures such as raising dam walls or dam deepening through dredging.
- **Trading platform:** Some stakeholders recommended an improved trading platform so that supplemented water is more easily accessed. However, other stakeholders noted there is an existing trading platform and it was a lack of understanding about the water product that is limiting tradability.
- **Upskilling:** There is an opportunity to upskill some of the mine workforce to transfer into water trades/engineering to address the deteriorating infrastructure in the region.
- **Ownership and governance:** Reconsideration of the ownership of Lake Moondarra and Lake Julius, and/or alternative governance models that incentivise alternative use of water allocations and avoid alternative water requirements such as bore fields.
- **Agricultural production:** Mount Isa is well known for its cattle grazing, however, generally transports its cattle closer to the coast for fattening prior to processing. The Agriculture pillar has been investigating the potential for forage and feedlots to develop the beef supply chain in region, which would then lead to the opportunity for a local abattoir.

Given the challenges associated with a beef only abattoir, there is opportunity for a more diversified and smaller scale operation that also processes game meats which are prevalent in the region. Indigenous communities are already preparing kangaroo meat for human consumption, and there is another abattoir in Longreach which specialises in petfood.

Access to safe and reliable water is not only a basic human need, but it is essential to several major operations in the region that have the potential to diversify Mount Isa's economy. Improving water access and reliability may also drive several agricultural opportunities in the region, which is a core industry in Mount Isa with plenty of opportunity for growth.

It was noted that the Gulf Water Plan is currently under review. There is an opportunity for stakeholders to re-think their relationship with water in the North West. This could for instance include seasonal allocations, approved by the State Government annually, associated with two parties entering into commercial arrangements.

J.6 Judiciary

Social and judiciary issues were a common feature during stakeholder consultations, and clearly present as a high priority for members of the community.

Some challenges with judicial infrastructure and operations in the region include:

- **Recent growth:** Local divisions have seen substantial growth recently, including the introduction of a new Vulnerable Persons Unit tasked with working with victims of domestic and family violence. Domestic and family violence is the most common offending pattern in the region and there is a lack of infrastructure to support victims.



- **Prisoner transport:** Prisoner transport comes at significant cost and risk. Approximately \$3 million per annum is spent on overtime to conduct prisoner transport. This leads to not only budgetary overrun but also staff burnout. Prisoners released from Townsville or Rockhampton will often fail to attend supervision as directed due to the logistical challenges of travel.
- **Lack of capacity:** The watchhouse regularly overruns its built capacity, which has drawn the attention of both the Queensland Police Union and Amnesty International due to possible human rights concerns. There is a residential rehabilitation centre in Mount Isa with very limited capacity and, individuals will often be held on remand while waiting for space to open in this facility. Community rehabilitation services in the area are extremely limited, which impacts the ability for referrals from Queensland Police Service (QPS) and Queensland Correctional Services (QCS) to address root causes of offending behaviour.

Opportunities in the region include:

- **Infrastructure needs:** With approximately 600 offenders under active supervision across Mt Isa, there is an opportunity to expand or upgrade the built infrastructure to meet demand and growth. Staff facilities are also in need of expansion and upgrade, which would help to encourage the workforce to live in region.
- **Proposed correctional centre:** Many stakeholders expressed in principal support for a new correctional centre in the region with capacity to support demand in Mount Isa as well as correctional facilities in Townsville and the Atherton Tablelands. The facility has the potential to generate hundreds of local jobs during construction and operations, which would drive a considerable level of economic activity for Mount Isa while addressing a social challenge in the region.
- **Diversionary and Youth Justice:** A pre-judicial or diversionary program for youth or adults at risk of entering the criminal justice system. This facility would likely be run by a not for profit / for purpose enterprise. With respect to the community and identity of Mount Isa this centre could have a work / agricultural focus. It could also have a focus on at risk First Nations individuals with a focus on connection to country and traditional healing practices.

Strong community services are essential in ensuring social cohesion and liveability in the region. QCS and QPS are both stable employers in the region, with relatively high median salaries, which is a strong justification for further investment in judicial services. The proposal for a new correctional centre in the region has the potential to provide a significant number of high median salary jobs in both construction and operation of the facility.



K Conclusions and next steps

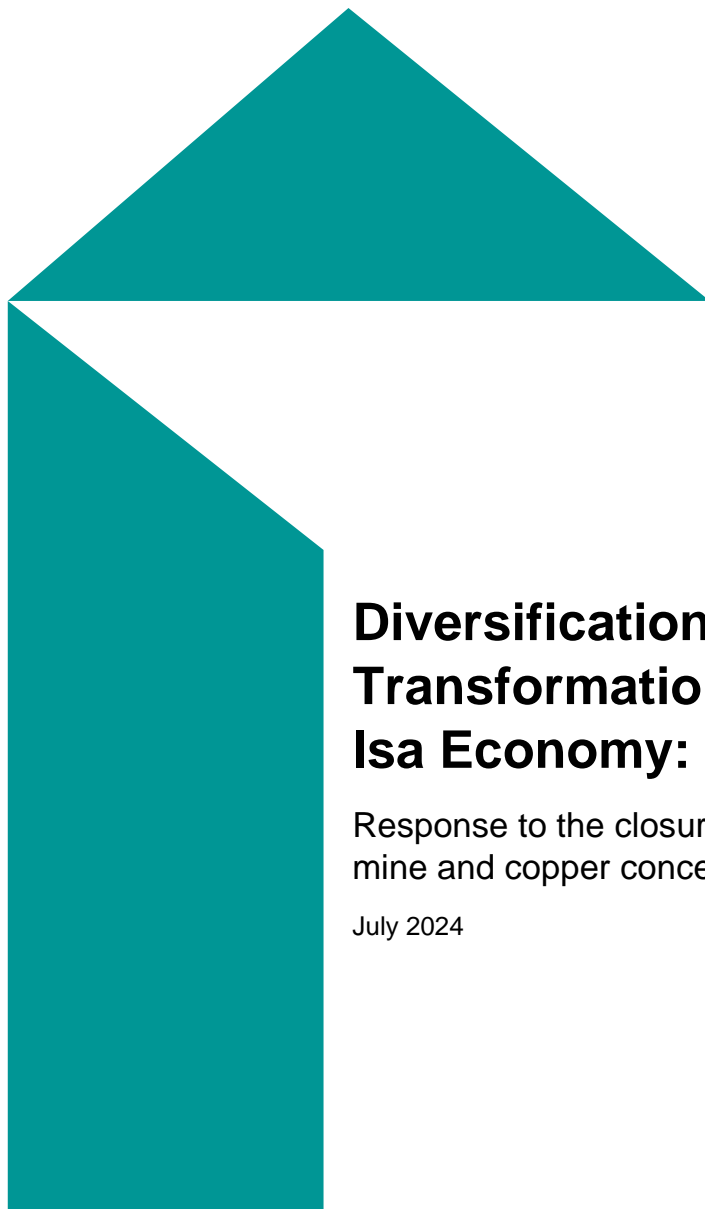
It is imperative that the transformation of Mount Isa's economy is informed by the needs of the community and local businesses to ensure its success. Therefore, the stakeholder engagement process has been a core component of the Critical Infrastructure strategy's development.

Stakeholders have identified several infrastructure challenges in Mount Isa and opportunities for industry development, with the key conclusions drawn summarised as:

- **Community needs and liveability:** There should be a focus on improving community amenity and liveability so that residents have a sense of community pride and workforces are more likely to choose to live in Mount Isa. There may be an opportunity to bring forward shovel-ready liveability projects and package them in line with the skills of the workforce potentially leaving Glencore.
- **Health and social services:** Treating patients in Mount Isa and the North West should be prioritised over transferring them to Townsville, as it reduces costs and has strong social benefits – considerable investment in health infrastructure and accommodation is required to support this.
- **Transport:** The reliability and resilience of the Mount Isa Line is essential to existing and future mining and bulk freight operations. Drainage and maintenance works are required to ensure the line remains operational during adverse weather events (such as extreme heat or heavy rain), and bridge works along the line could improve efficiencies by enabling double stacking. Measures should also be considered to address the monopolistic control of above and below rail assets, as well as improve access to rail for junior miners, potentially through subsidies or common user infrastructure.
- **Energy and resources:** Access to reliable and affordable energy is critical to new mining operations getting off the ground. These resources projects will be major employers in the region in the wake of the Glencore mine closure, so their realisation is essential. An alternative supply of sulfuric acid may also be required if the copper smelter closes, which presents an opportunity for a pyrite furnace in region. The CopperString project and any spurs will play an important role in providing a reliable and efficient energy source to these projects during construction and operations.
- **Water and agriculture:** Due to the regulatory environment for water, there is considerable supply sitting with entitlement holders unused while agricultural producers are struggling to access affordable and reliable water sources. While the region is known for its cattle farming, there are several challenges to developing a supply chain, also linked to reliable water supply and the ability to produce forage and create feedlots for cattle. However, there is potential opportunity to better leverage local knowledge and resources, such as through a diversified abattoir which processes game meats for human consumption or petfood.
- **Judiciary:** Existing watchhouse and rehabilitation assets in the region are at capacity. A new correctional facility has the potential to deliver jobs and drive economic activity in Mount Isa, particularly if supported by workforce accommodation to encourage staff to live in community.

These outcomes have informed the development of the economic transformation strategy for critical infrastructure, and a longlist critical infrastructure projects that have the potential to drive or support industry diversification, job creation and economic growth. These projects will then be shortlisted for consideration by Council for investment.

Please note this report will be updated as Scyne Advisory finalises the stakeholder engagement process and incorporated as an Appendix to our findings and recommendations at the conclusion of the project.



Diversification and Transformation of the Mount Isa Economy: Energy

Response to the closure of Mount Isa copper mine and copper concentrator in 2025

July 2024

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Diversification and Transformation of the Mount Isa Economy: Energy

Response to the closure of Mount Isa copper
mine and copper concentrator in 2025

July 2024

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Mott MacDonald | Diversification and Transformation of the Mount Isa Economy: Energy
Response to the closure of Mount Isa copper mine and copper concentrator in 2025

Contents

Executive summary	1
1 Project background	5
1.1 Introduction	5
1.2 Objectives and desired outcomes	5
1.3 Our approach	5
2 Context of Mount Isa	7
2.1 Strategic context of Mount Isa	7
2.2 Mount Isa Mines context	7
2.3 Socio-economic context in Mount Isa	8
2.3.1 Socio-economic characteristics of Mount Isa	8
2.4 Energy context in Mount Isa	10
2.4.1 Network reliability	11
2.4.2 Energy supply in the NWPS	11
2.4.3 Energy demand in the NWPS	12
2.4.4 Off grid and emerging loads	13
2.4.5 Energy and gas supply	15
2.4.6 NWPS committee	16
2.4.7 CopperString 2032	16
2.4.8 Privately owned generation and transmission assets	18
3 Opportunities and challenges in energy for Mount Isa	19
3.1 Copper industry	20
3.2 Critical minerals	20
3.3 NWPS operation	21
3.3.1 Islanded power system	21
3.3.2 NWPS operational structure	21
3.3.3 CopperString and NEM integration	22
3.4 Energy supply	22
3.5 Geographic Location	23
4 Energy projects assessment in Mount Isa	24
4.1 Stakeholder engagement	24
4.1.1 Client engagement	24
4.1.2 Key energy players in Mount Isa	25
4.1.3 Engagement with potential energy generators in Mount Isa	25
4.2 Coordination with other economy transformation pillars	25
4.3 Identification of energy projects	26

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Mott MacDonald | Diversification and Transformation of the Mount Isa Economy: Energy
Response to the closure of Mount Isa copper mine and copper concentrator in 2025

4.3.1	Long list of energy projects	27
4.4	Initial screening assessment	27
4.4.1	Approach for initial screening assessment	27
4.4.2	Identified projects for detailed assessment	29
4.5	Detailed assessment	29
4.5.1	Approach and detailed assessment framework	29
4.5.2	Identified projects for the Mount Isa Transition Fund and Phase 2 – Execution	32
4.5.3	Development risk and mitigation	38
5	Recommendations and findings	41
5.1	Medium to long term opportunities	42
5.1.1	CopperString connection	42
5.1.2	Mount Isa Renewable Energy Zone	46
5.1.3	Hydrogen hub blueprint	48
5.2	Policy and regulation advocacy	55
5.2.1	NWPS operational structure	55
5.2.2	Energy investment landscape	56
5.3	Social outcomes	58
5.3.1	Summary	58
5.3.2	Risks	58
6	Next steps	60
6.1	Funding Options	62
	Appendices	65
A.	Socio-economic considerations and case studies	66
A.1	Key considerations when planning for Mount Isa's future socio-economic prosperity	66
A.2	Quality of job creation	66
A.3	Mechanisms required to support the transition	69
A.4	Newcastle steelworks closure	69
A.5	Latrobe Valley power station closures	70
B.	Long list of options	72
C.	Assessment of shortlisted options	73
D.	Stakeholder consultation notes	74

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Mott MacDonald | Diversification and Transformation of the Mount Isa Economy: Energy
Response to the closure of Mount Isa copper mine and copper concentrator in 2025

Tables

Table 2-1: Energy demand customers	13
Table 2-2: Energy generation sources	13
Table 2-3: Advantages and disadvantages of private transmission asset ownership	18
Table 3-1: Opportunities and challenges in energy for Mount Isa	19
Table 4-1: Energy as a solution for the needs of Mount Isa's future economy pillars	26
Table 4-2: Initial screening assessment template	27
Table 4-3: Weighted Score Criteria	29
Table 4-4: Shortlisted energy projects	29
Table 4-5: Detailed assessment template	30
Table 4-6: Weighted Score Criteria	32
Table 4-7: Identified Projects	32
Table 4-8: Development risks	38
Table 5-1: Medium-long term opportunities	41
Table 5-2: Socio-economic benefit of a hydrogen hub	53
Table 6-1: Actionable next steps	60
Table 6-2: Funding Options	62

Figures

Figure 1-1: Recommended reforms, frameworks, and incentives	4
Figure 1-1: Advisory structure for the diversification and transformation of the Mount Isa economy	5
Figure 1-2: Methodology	6
Figure 2-1: Summary of key socio-demographic drivers of Mount Isa	10
Figure 2-2: NWPS generation sources	11
Figure 2-3: Energy demand customers in the NWPS	12
Figure 2-4: Demand and Installed capacity variation for Mount Isa mine closure and CopperString project connecting after 2029	14
Figure 2-5: Demand and installed capacity variation for Mount Isa mine closure	15
Figure 2-6: NWPS Committee Structure	16
Figure 2-7: CopperString project staging	17
Figure 4-1: Options identification process	24
Figure 4-2: APA solar farm	34
Figure 4-3: Representative solar + diesel + battery system	34
Figure 4-4: Proposed location	35
Figure 4-5: Representative Wind Farm	35
Figure 4-6: Gravity storage system	36
Figure 4-7: Representative hydrogen charging station	36
Figure 4-8: Phosphate Hill	37
Figure 4-9: Representative QLD Copper Mine	37
Figure 4-10: Representative microgrid	38

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Mott MacDonald | Diversification and Transformation of the Mount Isa Economy: Energy
Response to the closure of Mount Isa copper mine and copper concentrator in 2025

Figure 5-1: Impact of CopperString connection on Mount Isa's future economy	44
Figure 5-2: Considerations, risks and opportunities for a CopperString connected future	45
Figure 5-3: Photovoltaic Power Potential of Australia	46
Figure 5-4: Mean wind speed/potential map of Australia	47
Figure 5-5: Identified REZs in North and Far North Queensland	48
Figure 5-6: Overview of Hydrogen Supply Chain	50
Figure 5-7: Satellite image of infrastructure availability around Mount Isa	52
Figure 5-8: Conceptual 1 GW Hydrogen Production Facility Layout	53
Figure 5-9: Hydrogen hub implementation pathways	55
Figure 5-10: Reformed NWPS operational structure	56
Figure 5-11: Recommended reforms, frameworks, and incentives	57
Figure 6-1: Examples of the types of direct, indirect and enabled job creation opportunities as result of a particular economic activity (e.g. project, business and/or industry)	67

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Executive summary

Overview

Mount Isa City Council (Council) engaged Mott MacDonald as the 'Energy Pillar' consultant to provide commercial and technical advice on the opportunities available to Mount Isa within the energy sector, following the announcement from Glencore that the copper mine and concentrator is ceasing operations in 2025. To support the Council's goal of maintaining Mount Isa's population and diversifying its economy, Mott MacDonald has delivered analysis and strategic advice for Council in three key categories:

1. **Mount Isa Transition Fund (MITF) opportunities:** Projects in Mount Isa for the MITF – Stage 2.
2. **Medium- to long-term opportunities:** Strategies and options for future sustainable energy growth in Mount Isa.
3. **Energy policy advocacy:** Initiatives at state and federal levels that could catalyse the development of Mount Isa's economy.

Mount Isa is a rich minerals region, with the economy largely focused on copper extraction and production over the last 70 years. With the abundance of natural resources and its strategic location, Mount Isa's identity can extend beyond mining. The impending closure of the Glencore copper mine and the proposed CopperString development are a catalyst for a period of significant change within the Mount Isa region. These developments have exposed various challenges and opportunities surrounding the copper industry, energy supply, the nature of the NWPS operations, abundance of minerals in the region, and Mount Isa's strategic geographic location in Queensland.

Currently, over one third of Mount Isa's population are employed within the mining sector, with a large proportion impacted by the closure of the Mount Isa copper mine, which is currently owned and operated by Glencore¹.

In the Mount Isa region, the energy system is serviced by the North West Power System (NWPS), which is not connected to the National Electricity Market (NEM). Energy demand in the NWPS largely comes from the mines in Mount Isa, with APA group and Mount Isa Mines (MIM) the key operators for energy generation on the system. Some of the challenges in the NWPS include the lack of energy diversity, energy reliability issues, balance of supply and demand, the isolated energy system, and the unique organisation of the NWPS committee.

Findings

The detailed assessment of all identified energy developments in Mount Isa recommended three projects to consider for the Mount Isa Transition Fund (Stage 2). These projects scored highest due to their potential to support employment transition including upskilling, and contribute to economic growth:

1. Harmony Gold solar + diesel + battery storage

To support Harmony with their energy requirements through funding for their onsite 50MW power generation worth approximately \$250m. This option provides for major development in the region with potential job generation of 800 positions during the construction phase and 400 ongoing operational jobs. With the overall goal of connection to the NEM through CopperString, onsite generation was deemed to be the only economically feasible alternative

¹ [Mount Isa Mines \(glencore.com.au\)](https://www.glencore.com.au)

in order to expedite operations. The company would consider using solar and gas as an option in the short term with support from the State.

2. Someva wind farm

Someva Mount Isa Wind Farm is a proposed development located 7km east of Mount Isa City. With an estimated CAPEX of \$500m, the farm will be capable of generating between 150-230MW of power, utilising the abundant wind resources in the area.

The project may create over 100 full-time construction jobs over a two-year period, and 20 ongoing operation and maintenance positions utilising local industry with opportunities to upskill the local workforce. Although the economic growth potential of this project is promising, a key barrier to its success lies in the pathway to the market and the need to have shared ownership with an offtaker in order to 100% firm. Someva is also looking to have the government underwrite the project in order to address uncertainty and risk associated with a lack of an offtake agreement.

3. Green Gravity energy storage

Green Gravity are proposing to repurpose MIM copper mine underground shafts as Gravity Energy Storage Systems (GESS) with an estimated CAPEX of \$900m over several years. At this stage, the company has identified 15 mine shafts which could be converted to provide 2-2.5GWh of storage creating up 350 jobs during construction, and 20-50 full-time positions during operations. The project would take the following staged approach:

- Stage 1 (2025-2027) - 250MWh
- Stage 2 (2027-2029) - 500MWh
- Stage 3 (2029-2033) - 1500MWh

This is an innovative solution for Mount Isa given the existing assets and infrastructure the mines already have.

Several medium- to long-term opportunities were also recommended through stakeholder consultation and options assessment:

CopperString

- CopperString is poised to be a transformative economic stimulus for Mount Isa, offering customers access to a regulated energy market, likely a more reliable supply, and opportunities for expanded renewable energy, hydrogen, and mining development. While construction has commenced from Hughenden to Cloncurry due to early approvals, there is uncertainty for NWPS connecting with CopperString (Cloncurry to Mount Isa) as the business case for this connection has not yet been approved.
- The development of the CopperString project is essential for the advancement of renewable energy and regional load-side development in the region. Council's advocacy efforts are crucial and should be actively pursued to facilitate the successful realisation of CopperString's potential.

Renewable Energy Zone

- The Mount Isa region, although rich in natural resources and infrastructure, faces high energy costs, low supply reliability and demand challenges due to its isolation from the Queensland super grid and the NEM. The proposed CopperString project aims to connect the region to the NEM, reducing energy costs and stimulating economic growth by unlocking renewable energy potential and attracting investment.
- Despite natural advantages, Mount Isa is not identified as a Renewable Energy Zone (REZ) in the Queensland Government's roadmap². Without a REZ, it will be challenging for the region

² [Renewable Energy Zone \(REZ\) Roadmap QLD Map \(hpw.qld.gov.au\)](https://hpw.qld.gov.au)

to achieve the technical, economic, social, and environmental benefits from an expanded renewable energy industry and mining and other industrial investments.

- A REZ has the potential to provide centralised green energy, lower energy cost, improved system reliability, streamlined connection process, energy supply competition and contribute to emission reductions.

Hydrogen

- The region's high solar irradiance and wind speeds that can facilitate green hydrogen production, which can be used for energy storage, power generation, and as a carbon-neutral fuel for other end uses, both domestically and for export.
- Hydrogen can strengthen the local power supply and serve as a backup during critical failures, addressing Mount Isa's energy reliability issues.
- The viability of a hydrogen hub depends on available land, renewable power, water, and hydrogen offtakers. The region has suitable infrastructure and a potential hydrogen demand of 229,000 TPA³ from various sectors.
- Establishing a hydrogen hub could create jobs, upskill the workforce, and provide educational opportunities, contributing to the socio-economic development of Mount Isa.

Key policy and regulatory reforms

The following key policy and regulatory reforms were identified that would enhance renewable energy development in Mount Isa, focused in particular on the operational and governance structure of the NWPS. The current committee-based system, dominated by APA, hinders competition, suggesting a need for Ergon to assume an independent operator role, fostering transparency and competition. This shift simplifies the integration of the NWPS into the NEM, especially if CopperString does not proceed.

An implementation roadmap for NEM integration is required and would include actions to transition responsibilities to Ergon or another third party in the interim, and engagement with key stakeholders such as the Australian Competition and Consumer Commission as AEMO likely takes on the market operator role.

Additionally, policies to balance renewable supply with mining demand, reduce investment uncertainty, and strengthen the grid are proposed, aiming to stimulate economic growth, job creation, and support for First Nations communities, ensuring Mount Isa maximises its mineral and renewable energy potential.

Further energy policy recommendations are highlighted in Figure 1-1.

³ Refer to Section 5.1.3 for the assumptions to derive this value

Figure 1-1: Recommended reforms, frameworks, and incentives

Context	Recommendation	Policy Options	Outcomes
 Balance Resources & Renewables	<ul style="list-style-type: none"> More renewables supply to the region should stimulate lower cost electricity if targeted at a growing energy demand from the resource sector. 	<ul style="list-style-type: none"> Create an economic growth policy which leverages the benefits of CU string supported by economic stimulus for mining through renewable targets. 	<ul style="list-style-type: none"> Create a supply - demand balance by matching an increase in renewables supply with an increased demand through mining investment.
 Reduce Investment Uncertainty	<ul style="list-style-type: none"> Provide electricity price & connection certainty by creating a LT infrastructure cost recovery approach (e.g. park & loan, smearing to SEQ or new region). 	<ul style="list-style-type: none"> Reshape the CSO, offer green loans or other financial / planning incentives to investment recovered through the NWMP resources boom. 	<ul style="list-style-type: none"> Lower and certain electricity prices will drive economic development if supported by a LT resource development policy and decarbonisation target.
 Existing energy as an Enabler	<ul style="list-style-type: none"> Centralise system strength through existing gas generation & BESS at Mt Isa will enable more VREs which enables a lower LCOE locally. 	<ul style="list-style-type: none"> Define access arrangements, separate system planning function from APA, and possibly subsidies connections, new load & system strength capacity. 	<ul style="list-style-type: none"> Improved grid strength, facilitated by a more competitive & independent system planning body will provide greater renewables & mining investment.

Source: Mott MacDonald

Recommended next steps

This report identifies several actionable next steps for Council. These are the next steps that relate to the options identified:

- Advocate for MITF Stage 2 funding projects that have been identified as high priority: Harmony Gold solar + diesel + battery storage, Someva wind farm and Green Gravity energy storage.
- Initiate the development approval process with Powerlink and the State Government for the Mount Isa phase of CopperString within this calendar year to prevent any potential delays.
- Craft a compelling business case for the Mount Isa Renewable Energy Zone to present to Powerlink and the State Government, ensuring alignment with the Queensland Renewable Energy Zone (QREZ) strategy.
- Formulate a hydrogen infrastructure roadmap that aligns with the blueprint provided in this report, outlining key steps and milestones.
- Develop a demand strategy to reinforce the requirement for renewable energy, and CopperString.
- Propose a restructuring of the NWPS Committee's operational framework, recommending Ergon as the interim market operator until CopperString's integration, followed by AEMO assuming the market operator role.
- Support the establishment of a conducive energy investment environment in Mount Isa by proposing and advocating for new policy initiatives that encourage energy development in the region.
- Develop a roadmap for energy transition social outcomes, focused on maximising employment opportunities and benefits for the Mount Isa community.
- Seek funding or other support through various funding bodies (e.g. ARENA, CEFC, Australian Government, Queensland Government) to support the next stage stages for Mount Isa's transition. A list of relevant funding options is detailed in Table 6-2 of section 6.1.

1 Project background

1.1 Introduction

In mid-October 2023 Glencore announced closure of its underground copper mine and concentrator in 2025 in Mount Isa, along with the nearby Lady Loretta Zinc mine. These closures will result in the loss of 1,200 jobs directly and, without intervention, a further 3,600 in the service sector of the town’s population of roughly 21,000. The copper smelter is also anticipated to cease operations in 2030, but the outcome will depend on the approval of additional capital investments. Further negative ramifications will occur if this smelter also decommissions.

Considering the impending closure of Glencore’s assets, the Mount Isa City Council (Council) has undertaken an initiative to support the diversification and transformation of the Mount Isa economy through five future economy pillars as shown in Figure 1-1.

Figure 1-1: Advisory structure for the diversification and transformation of the Mount Isa economy



Source: Mott MacDonald based on Mount Isa City Council’s data

1.2 Objectives and desired outcomes

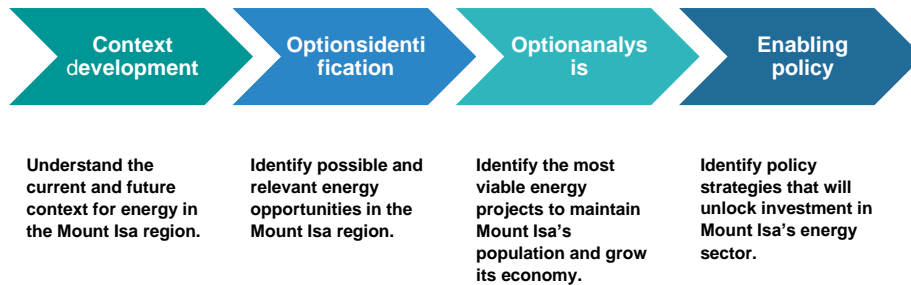
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1. **Mount Isa Transition Fund (MITF) opportunities:** Projects in Mount Isa for the MITF – Stage 2.
2. **Medium-to-long term opportunities:** Strategies for sustainable future energy growth in Mount Isa.
3. **Energy policy advocacy:** Initiatives at state and federal levels that will catalyse development of Mount Isa’s economy.

1.3 Our approach

To deliver on Council’s objectives and desired outcomes, we followed the methodology illustrated in Figure 1-2.

Figure 1-2: Methodology



Source: Mott MacDonald

The report begins by outlining Mount Isa's geographical, socio-economic, and energy context in **Section 2**, providing a crucial foundation for the analysis and strategic recommendations detailed in subsequent sections. **Section 3** then discusses the opportunities and challenges for development in Mount Isa's energy sector based on the local context.

The identification and analysis of energy projects and opportunities in the Mount Isa region is detailed in **Section 4**, which outlines the process of:

- **Stakeholder engagement** and consultation undertaken to identify projects as well as discover barriers and enablers to projects.
- **Identification of energy options** as a long list of potential projects, each with different levels of feasibility for potential implementation in Mount Isa.
- **Initial screening of options** to shortlist potential projects by evaluating their commercial feasibility, environmental feasibility, and economic development potential.
- **Detailed assessment** of the shortlisted projects to analyse their alignment with Council and MITF's objectives.

Each stage was progressive, with collaboration between Mott Macdonald and Council informing the development of the analysis.

The outcomes of the context development and options analysis phases, including recommendations and findings, are set out in **Section 5**. Recommendations are categorised on their ability to deliver on Council's objectives and desired outcomes for MITF funding, medium- to long-term opportunities, and energy policy advocacy. Lastly, **Section 6** outlines next steps for Council to progress the recommendations and findings of this report.

2 Context of Mount Isa

This section outlines Mount Isa's strategic, mining industry, socio-economic, and energy context, providing a crucial foundation for the analysis and strategic recommendations detailed in subsequent sections.

Mount Isa is strategically placed to support the development of Northern Australia and Far North Queensland through its wealth of minerals, energy resources and transport assets. However, the closure of key Mount Isa Mines facilities in the region puts the operation of some key transport and energy assets at risk and will also put pressure on the socio-economic context of Mount Isa which is already challenging.

The socio-economic and energy context of Mount Isa serves as a foundation the city can capitalise on to explore opportunities for further development in energy and diversification of the local economy, as analysed in Sections 2.3 and 2.4.

2.1 Strategic context of Mount Isa

Mount Isa is a rich minerals region, which has focused largely on copper extraction and production over the last 70 years. The region is also home to various new economy minerals with three quarters of these minerals still to be mined. These minerals include the new economy minerals such as cobalt, copper, gold, graphite, molybdenum, rare earth elements, rhenium, silica, silver, vanadium, and zinc.

Infrastructure that supports Mount Isa's strategic proximity to these minerals includes:

- Access to the eastern seaboard via a direct rail connection to the Port of Townsville
- Direct road access to Australia's national highway system
- An existing power system
- Water reserves in Lake Moondarra and Lake Julius
- Proximity to gas pipeline infrastructure connecting it to the key gas nodes of Roma and Gladstone towards the south and Tennent Creek towards the west
- An established modern airport with scope for international trade destinations.

The Mount Isa region also has good solar and wind resources, innovative energy storage opportunities, and land availability.

The CopperString transmission link between Townsville and Mount Isa will play a large role in transforming this energy network and market landscape within the region and is expected to be completed by 2029.

2.2 Mount Isa Mines context

Through Mount Isa Mines (MIM), copper is extracted from two mining sites, the Enterprise and the X41 underground mines. Raw copper is processed at the onsite concentrator and smelter. The processed copper anodes are then transported to Townsville for further refinement, and then shipped both domestically and internationally. The closure of the copper mine will have significant impacts, not only for Mount Isa, but for Australia, and other parts of the world.

The copper smelter is also a significant asset that helps provides substantial value in the supply chain ranging from:

- Supplying Incitec Pivot with the waste emissions

- Enabling the rail system from Mount Isa to anodes that is transported to Townsville
- Exporting opportunities to international and domestic customers
- Providing end user manufacturing companies with copper and fertilisers

The current copper processing operations will continue to have a sizeable impact on the supply chain socially and economically after the decommissioning of the copper mine and concentrator in 2025.

2.3 Socio-economic context in Mount Isa

The 2025 closure of the Glencore copper mine and copper concentrator presents an immense challenge for the community of Mount Isa. The actions taken now and in the immediate future will be crucial in determining how the city approaches the long-term challenge of diversifying and transforming an economy historically heavily reliant on the mining sector. The Glencore copper mine and concentrator will remain key stakeholders as part of Mount Isa identifying a way forward that allows it to retain its population base and sustainably prosper into the future.

This section highlights:

- Existing socio-economic characteristics of the Mount Isa community
- Key considerations when planning for Mount Isa's socio-economic success into the future
- Core social principles for consideration by Council, as part of developing an approach moving forward
- Examples of how other communities have approached similar challenges presented by mine closures and the outcomes of their approach

It is important to note that a comprehensive analysis of social impacts is not part of the scope of this report, and this work will be undertaken at a future date.

2.3.1 Socio-economic characteristics of Mount Isa

To identify viable energy projects that can help Council retain its population base and grow its economy, we must consider Mount Isa's socio-economic context and the challenges and opportunities it presents. Further demographic detail can be found in the McKell report⁴. Some of the key and relevant findings for the consideration of energy projects are summarised below.

2.3.1.1 Industry and identity

Mount Isa LGA's labour force in the June quarter of 2023 was 10,728. Employment is heavily concentrated in the mining industry with more than one third of people who work in Mount Isa working in this industry (34.6%)⁴. 17.1% of employed people aged 15 years and over in Mount Isa work specifically in the Copper Ore Mining Industry.⁵ Other key industries for Mount Isa include health care and social assistance (12.9%) and education and training (7.7%)⁴.

Mining is at the core of Mount Isa's identity – the city's very existence was triggered by a prospector observing vast mineral deposits in the area in 1923. The Glencore copper mine has been in production for over 90 years, nearly as long as the city itself has been established.

Further research needs to be undertaken to investigate and understand the community's sense of their own identity, the attachment they have to this identity, the role mining and specifically copper mining plays, and their ideas for how Mount Isa's industry and identity could grow and diversify. According to the McKell report, within the mining industry, employment is concentrated among Machine and Stationary Plant Operators (968 - 28.7%), Automotive and Engineering Trades

⁴ [Labour Market Analysis - Mount Isa \(quarto.pub\)](#)

⁵ [2021 Mount Isa, Census All persons QuickStats | Australian Bureau of Statistics \(abs.gov.au\)](#)

Workers (554 - 16.4%) and Design, Engineering, Science and Transport Professionals (303 - 9.0%)⁴.

2.3.1.2 Political and policy context

There are political factors that contribute to Mount Isa's overall socio-economic context and the challenges and opportunities presented by its transition out of copper mining.

At a state level, the Queensland Government has galvanised its commitment to pursuing renewable energy targets and net zero emissions by 2050 in the Queensland Energy and Jobs Plan. The plan outlines the Government's pathway to a clean, reliable, and affordable energy system. With this state-wide focus on renewables and reducing emissions, there is considerable momentum in investigating the feasibility of renewable energy projects, and where possible, fast-tracking this work. This presents an opportunity for Mount Isa, but it is also worth understanding the capacity of the local and national workforce to deliver these projects with the number of renewable projects ramping up. At a state and national level, as communities transition out of mining, there is an opportunity to share learnings through a structured central organisation on different approaches and outcomes to help inform communities who are just entering this transition.

2.3.1.3 Aboriginal and Torres Strait Islander Peoples

Mount Isa has a large population of Aboriginal and/or Torres Strait Islander peoples - approximately 25% of the overall resident population. This is significantly higher than the average for Queensland (4.6%)⁴. The mining industry is a significant employer of Aboriginal and/or Torres Strait Islander peoples in Mount Isa, employing 240 people. Further research is required to understand the impacts of the Glencore copper mine's closure on Aboriginal and Torres Strait Islander peoples, including the number of Aboriginal and Torres Strait Islander peoples employed by the copper mine and how its closure could impact a population with an already higher proportion of people either not in the labour force, or unemployed and looking for work⁴.

2.3.1.4 Population

The McKell Institute's report provides a comprehensive analysis of Mount Isa's population trends and potential impacts/issues.

When considering how to retain Mount Isa's population base, it is important to note that the total resident population of the Mount Isa region has been in decline since 2011; the population reached a peak of 22,000 in 2011 and fell to 19,000 in 2022 – a decline of approximately 15%⁴. We need to understand and ultimately work against a trend that has been in development for some time without the copper mine closure as a contributing factor. Is it also critical to consider how the copper mine closure could risk increasing the already existing rate of population decline in Mount Isa.

The McKell Institute's report also highlights the aging population of Mount Isa; there has been an increase in the proportion of the population aged over 65 and a decrease in the working age population (aged 15-64 years)⁴.

With the closure of the copper mine, there is an opportunity to look at how Mount Isa could use its shift to other industries to diversify its population base and potentially turn around the downward trend in its population growth.

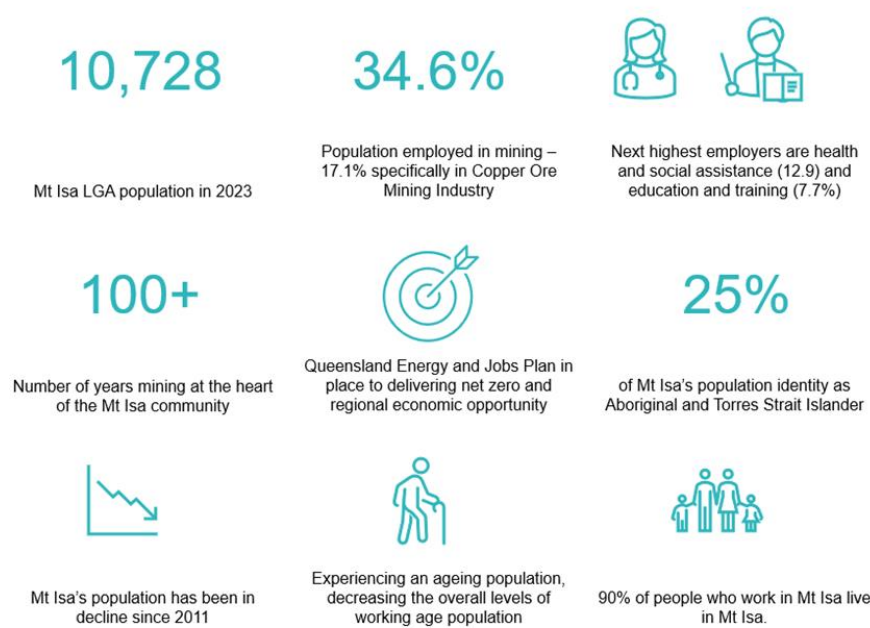
2.3.1.5 Location

Mount Isa is located in Queensland's north west, with the closest major city, Townsville, located 883km inland. Although there is some level of fly-in-fly-out employment in Mount Isa from Brisbane, Townsville, and the Sunshine Coast, around 90% of the people who work in Mount Isa

also live in Mount Isa⁴. Given its relative distance from other cities, it is likely that workers (and their families) could leave Mount Isa if they lose their jobs through the Glencore copper mine closure and are unable to find alternative employment relating to their existing skillset locally.

Key demographic and population trends have been summarized in Figure 2-1 below. Detailed assessment of Mount Isa's socio-economic context and the impacts of the mine closure should be part of the program of any analysis on options going forward.

Figure 2-1: Summary of key socio-demographic drivers of Mount Isa



Source: Mott MacDonald

2.4 Energy context in Mount Isa

The Mount Isa region is serviced by the North West Power System (NWPS) that operates in isolation from the National Energy Market (NEM). The area solely depends on the power resources available within the region's isolated network.

The network infrastructure of the NWPS comprises large sections of transmission level (220kV and 132kV) and sub transmission level (66kV) lines that service large mining loads and towns, along with 13 substations. Sections of distribution level (11kV and below) lines of the network infrastructure service the residents and small loads of the Mount Isa and Cloncurry region.

Energy demand in the NWPS largely comes from the mines in Mount Isa, with APA group and MIM as the key players in energy generation. The largest generation sources are 1) gas power stations, 2) solar generation and 3) waste heat recycling.

May 2024

Mott MacDonald Restricted

2.4.1 Network reliability

The reliability of the NWPS has been and continues to be a concern for users. The main contributor to this is load shedding, which results in energy end users experiencing frequent energy outages. This in turn impacts overall service levels, the profitability of the energy grid and end users.

Although customers in the NWPS acknowledge and have agreed to the economic trade-off between reliability and cost-effective generation, [the demand for a dependable power supply in the region remains high](#). Reducing the likelihood and duration of load shedding is a priority for NWPS energy consumers and should be a central consideration for any energy strategy developed for the Mount Isa region.

Connecting Mount Isa to the NEM through CopperString will likely resolve reliability issues, but in the meantime, the coordinated connection of more energy generation to the NWPS before CopperString connects will provide that additional supply.

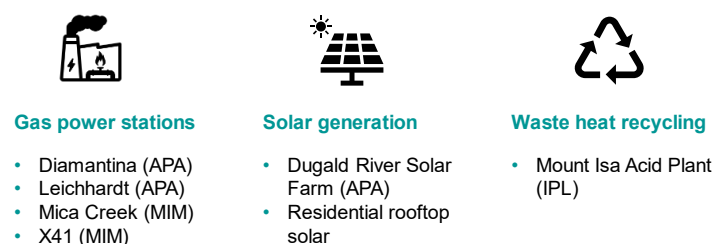
2.4.2 Energy supply in the NWPS

Historically, the NWPS has been designed with a demand-driven approach. The development of energy generation capacity, and associated generation mix⁶, has been planned to directly meet the requirements of major loads in the region. Power stations in the region largely rely on gas as their primary source of energy, which is supplied through transmission pipelines from southwest Queensland. However, the network has seen a recent expansion in non-residential, utility scale solar farms due to:

- The lower cost of installation and operation of solar
- Large loads required to fulfil obligations under the Safeguard Mechanism⁷
- NWPS energy consumers, in certain instances, intending to act on shareholder pressures related to emissions reduction and Environmental, Social, and Governance (ESG) standards.

Energy is primarily generated by two providers, APA Group and MIM, from the power plants shown in Figure 2-2.

Figure 2-2: NWPS generation sources



Source: Mott MacDonald based on Mount Isa City Council data

⁶ The generation mix refers to the variety of different primary energy sources (such as fossil fuels and renewables) used to produce electricity in a network.

⁷ The Safeguard Mechanism is a policy designed to reduce emissions from the Australia's largest industrial facilities. It sets legislated limits, known as baselines, on the greenhouse gas emissions of these facilities, which will decline predictably and gradually to align with Australia's emission reduction targets. More information on the policy can be found here: [Safeguard Mechanism - DCCEE](#)

Existing loads connected to the NWPS amount to approximately 300MW of demand. While most of this demand is met through established generation contracts, MIM has opted to acquire or develop its own generation assets within the NWPS, namely the Mica Creek and X41 Power Stations, to avoid the need for external power purchase agreements.

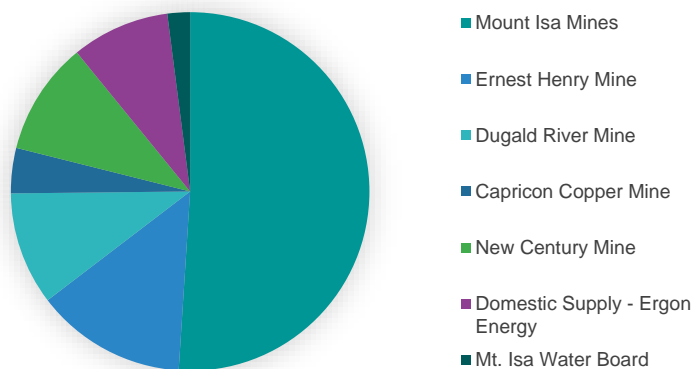
In general, limited competition for power generation isolated power systems, such as the NWPS, can lead to several downsides, including:

- With fewer competitors, there is **less pressure to keep prices low**, potentially leading to higher energy costs for consumers.
- A lack of competition can stifle innovation, as there is less incentive for companies to invest in new technologies or improve services.
- Monopolistic control may result in **poorer service quality**, as there is no competitive drive to enhance customer satisfaction.
- Without competitive pressure, there may be **less focus on energy efficiency**, which can impact both costs and environmental sustainability.

2.4.3 Energy demand in the NWPS

Energy demand in the NWPS is comprised of a collection of large mines, and residential and town services loads, as shown in Figure 2-3.

Figure 2-3: Energy demand customers in the NWPS



Source: Mott MacDonald based on Mount Isa City Council data

150MW, or 51%, of the load in the NWPS is demand from MIM’s Mount Isa Copper Mine, George Fisher, and copper smelter assets, which are owned and operated by Glencore. The closure of the copper mine and concentrator in 2025 and smelter in 2030 will therefore have a significant reduction effect on the demand in the NWPS.

Apart from other mines and the Mount Isa Water Board, only 26 MW, or 9%, is used for domestic supply. The domestic load in Mount Isa has maintained consistency over the past few years, attributed to the relatively unchanged population in the area. Residential rooftop solar generation in the NWPS has been increasing significantly in past years with year-on-year growth of between 10% and 25% and may further reduce domestic load.

Given Mount Isa’s relatively consistent population and the rise in rooftop solar generation, there appears to currently be no urgent need to invest in additional generation capacity to meet domestic demand. Any anticipated increase in residential demand is likely to be offset by the increase of rooftop solar installations. Instead, strategic investment in generation capacity within the NWPS should prioritise serving the substantial industrial mining loads as has historically been the case.

2.4.4 Off grid and emerging loads

There are numerous mines not connected to the electricity network, with total estimated demand exceeding 300 MW. These mines are situated far from the present electrical transmission network and constructing new lines to connect these loads to the network would require an economic cost-benefit analysis.

Furthermore, there are several proposed new loads in the Mount Isa region which totals to approximately 70 MW. There may be opportunities to connect some of these proposed new loads to the transmission network.

As the power network in Mount Isa is not connected to the NEM, demand is solely met by the generators within the Mount Isa region. Mica Creek Power station had been in operation since 1960 but ceased operations in 2021 and supply for the area is currently provided by four major power plants in addition to the rooftop solar generation. Gas generation in the NWPS grid is 80% and only 20% is produced using renewable energy to meet the demand, as seen in Table 2-2.

Table 2-1: Energy demand customers

Demand Source	Maximum demand (MW)
Mount Isa Mines (Glencore)	150
Ernest Henry Mine (Evolution Mining)	40
Dugald River Mine	30
Capricorn Copper Mine	12
New Century Mine	30
Domestic Supply - Ergon Energy	26
Mt. Isa Water Board	6

Source: Mott Macdonald based on Mount Isa City Council data

Table 2-2: Energy generation sources

Current Generation	Source	Maximum demand (MW)
Diamantina Power Station	Gas fired	240
Thompson	Gas fired	28
X41 Power station	Gas fired	41
Leichhardt Power Station	Gas fired	60
Mica Creek Power Station	Gas Fired	100
DR Solar farm	Solar	88
Mt. Isa Acid Plant power station	Waste heat	14
Rooftop solar in the region	Solar	14

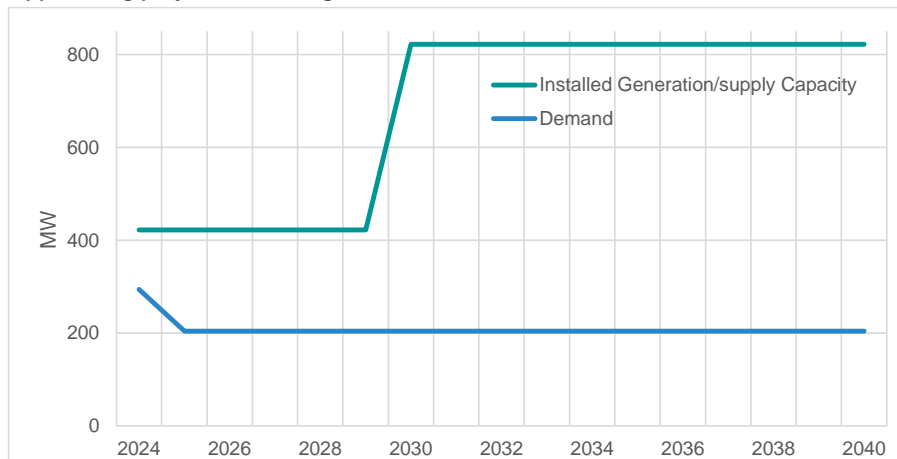
Source: Mott Macdonald based on Mount Isa City Council data

The current power infrastructure leverages a diversified portfolio of energy sources, including gas, solar, and waste heat power generation. Given the continuous operational nature of mining activities, it is imperative to ensure a consistent and stable supply of power to meet the persistent demand. Therefore, the generation capacity must be robust enough to sustain this demand throughout the entire day. However, when conducting contingency planning for worst-case scenarios, the generation capacities of solar and waste heat plants are not factored in due to their inherent variability and dependence on external conditions.

The power system currently has firm generation capacity of 370 MW. Notably, the Mica Creek power station operates below its installed capacity after its shutdown in 2021, contributing only 100 MW to the network. In aggregate, gas-powered stations provide a total supply of 470 MW. Conversely, the existing mines and domestic customers demand approximately 300 MW in the region. This marginal gap between the supply capacity and the demand poses a challenge for the system to deliver a reliable power supply. This is further complicated by generator downtimes due to maintenance and unexpected failures.

After the closure of the Mount Isa Mine, there will be a reduction in demand by approximately 90MW. This decrease will reduce the strain on the power generation system. Furthermore, the integration of the CopperString infrastructure will create capacity for larger demand additions to the system. The anticipated impact of these changes on the power system is illustrated in Figure 2-4.

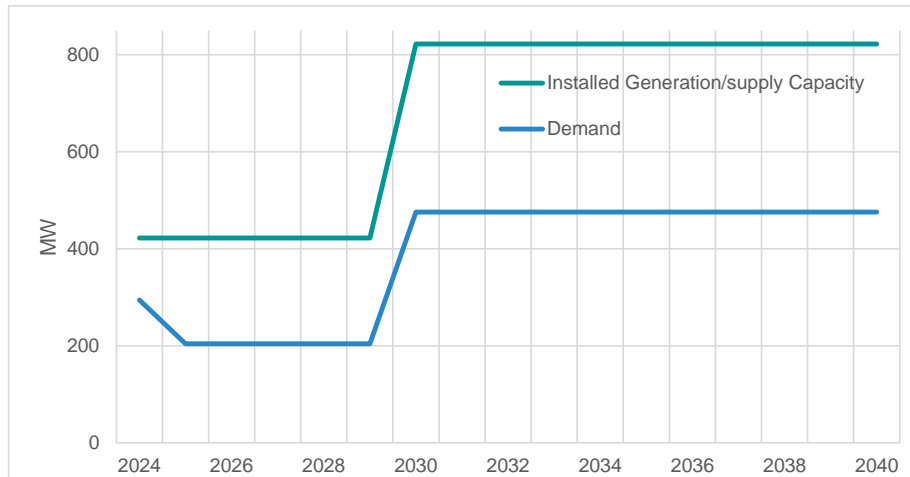
Figure 2-4: Demand and Installed capacity variation for Mount Isa mine closure and CopperString project connecting after 2029



Source: Mott MacDonald based on Mount Isa City Council data

With ongoing minerals development in the region, newly explored mines will need to connect to the power network. Figure 2-5 illustrates the variations in demand and supply capacity in the region, both prior to and following the integration of the CopperString project. It is apparent from the data that the NWPS alone will be insufficient to accommodate emerging loads. The successful connection of the CopperString project to the NWMP is therefore a critical requirement for effectively managing these new loads.

Figure 2-5: Demand and installed capacity variation for Mount Isa mine closure



Source: Mott MacDonald based on Mount Isa City Council data

2.4.5 Energy and gas supply

The Mount Isa region receives gas supply from the Northern Gas pipeline from Tennant Creek (NT), and the Carpentaria Gas pipeline from Ballera, which are 622km and 840km in length respectively.

The Northern Gas pipeline, owned and operated by Jemena, was designed for the purpose of transporting gas from production sites in the Northern Territory to the areas of demand in Mount Isa and the eastern states of Australia⁸. Gas supply issues however have stopped flow in the Northern Gas pipeline on four separate occasions since 2022, the most recent shutdown being March 2024⁹.

The uncertainty of supply from the Northern Gas pipeline has placed greater reliance on the Carpentaria Gas pipeline, which is owned and operated by APA and predominantly supplies the Mica Creek and Diamantina gas power station customers in Mount Isa. Although demand comes from the mines, APA is not expected to be greatly impacted by the closure of the Glencore copper mines. Conversely, as the smelter is the most energy intensive component, this poses a significant concern surrounding demand if it were to go offline.

APA Group have also completed construction of the Mica Creek Solar Farm, which will power Mount Isa's North West Minerals Province. This solar farm is a promising development, as there is room for expansion at the site, alongside a growing interest in wind power and Battery Energy Storage Systems (BESS).

⁸ Northern Gas Pipeline | Jemena

⁹ https://www.abc.net.au/news/rural/2024-03-20/northern-gas-pipeline-ceases-delivery-after-gas-shortfall/103602054?utm_campaign=abc_news_web&utm_content=link&utm_medium=content_shared&utm_source=abc_news_web

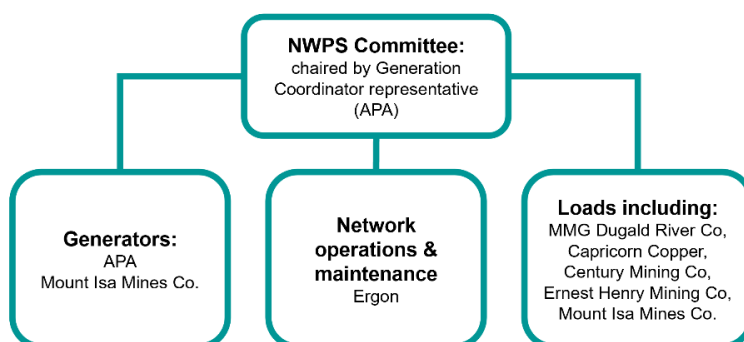
2.4.6 NWPS committee

The NWPS committee plays a crucial role in coordinating electricity dispatch schedules and ensuring efficient operation within the NWPS. Specifically, the committee is responsible for agreeing to rules related to the following aspects:

1. The NWPS committee **coordinates the dispatch schedules of generators**. This involves optimising the allocation of generation resources to meet demand while maintaining system stability.
2. The committee **oversees demand management strategies, including load shedding when necessary**. By managing consumption during peak periods or emergencies, they help maintain grid reliability.

The NWPS committee is comprised of two key roles: the Chairperson and the Generation Coordinator; and three key bodies: generators, network operators and load participants, summarised in the figure below.

Figure 2-6: NWPS Committee Structure



Source: Mott MacDonald

Functionally, the Chairperson and Generation Coordinator roles are currently held by the same APA appointee. The dual responsibilities of the Chairperson and Generation Coordinator, balancing prudent and efficient NWPS operation while also determining generation and energy pricing arrangements, poses a challenge to the business case of current and future load participants in the Mount Isa region. This issue is discussed further in Section 3.3.

2.4.7 CopperString 2032

The CopperString 2032 project is a significant initiative that aims to transform the energy network and market in the Mount Isa region. The project involves the construction of a transmission link between Townsville and Mount Isa which will create construction jobs in the short term and several permanent jobs for the maintenance of the line.

The project is planned to include several key components. These include a 500kV transmission line from south of Townsville to Hughenden, a 330kV transmission line from Hughenden to Cloncurry, and a 220kV transmission line from Cloncurry to Mount Isa. Additionally, up to six new substation sites are planned along the entire alignment.

Before the construction of the power lines begins, preparations for workers' accommodation are expected to start in mid-2024. The construction and implementation of the project will follow a specific order based on the granting of approvals and the availability of resources.

The project will be implemented in stages, with each stage corresponding to a specific section of the transmission line. The current delivery staging is as follows¹⁰:

- Stage 1: Hughenden to Julia Creek
- Stage 2: Julia Creek to Cloncurry
- Stage 3: Cloncurry to Mount Isa
- Stage 4: Townsville (Woodstock) to Hughenden.

As shown in Figure 2-7 the initial stage is scheduled to commence construction in the first quarter of 2025, progressing westward. The second stage is set to continue in the subsequent quarter of the same year and the third stage is planned to initiate in the first quarter of 2026.

The final stage, stage four, is scheduled to begin construction in the third quarter of 2026 and the transmission infrastructure is planned to be constructed by 2029.

Figure 2-7: CopperString project staging



Source: CopperString 2032 information sheet- March 2024

The CopperString project, like other large-scale infrastructure initiatives, is anticipated to encounter several challenges during its execution. A primary hurdle is the procurement of regulatory approvals for the project. This process involves navigating intricate frameworks at both the state and federal levels, which can be a complex and time-consuming task.

Financing is another significant challenge for a project of this magnitude. Securing adequate funding requires a healthy economic return to attract potential investors, which can present its own set of difficulties.

Moreover, this project marks the first instance of a 500kV transmission asset being constructed by Powerlink in Queensland. Consequently, there are likely to be technical challenges to overcome, particularly in terms of human resources and materials. These challenges must be effectively addressed to ensure the successful delivery of the project.

At present, the distribution infrastructure in the Mount Isa region is under the ownership and operation of Ergon Energy. Given that it is not connected to the NEM, the NWPS functions

¹⁰ [CopperString 2032 Information Sheet March 2024.pdf \(powerlink.com.au\)](#)

independently with multiple generators connected. The CopperString project will help to ease issues identified in previous sections regarding reliability, supply, and demand issues, by connecting the region to the NEM. Consequently, a collaborative approach between Ergon Energy and Powerlink will be essential to maximise the benefits of the project for both industrial and residential customers in the area.

Ergon Energy will play a pivotal role in the integration of the CopperString transmission line with its existing distribution infrastructure. Concurrently, Powerlink will be tasked with addressing the regulatory aspects associated with connecting the CopperString to Queensland’s existing transmission infrastructure. This responsibility extends beyond mere connection, encompassing the construction, operation, and maintenance of the infrastructure.

2.4.8 Privately owned generation and transmission assets

The NWPS electricity network was developed according to the areas that required significant electricity supply (predominantly from the mines with industrial loads that made up 91% of the NWPS as described previously). The structure of the NWPS committee is such that network planning and development must be agreed upon by all committee members who each have different business needs and priorities. For example, the construction of additional transmission infrastructure for a new load on the NWPS is not often beneficial to the loads already connected to the network. Due to this, the development of private infrastructure within the NWPS is often required to meet the approval of the NWPS committee in a timely manner for development.

Several transmission assets in the NWPS are privately owned and operated by MIM/Glencore and MMG, including:

- MIM/Glencore
 - Private transmission lines from Mica Creek substation to Lake Moondarra and George Fisher Mine as well as from Gunpowder substation to Lady Loretta Mine
 - Private substations at Hilton/George Fisher Mine, George Fisher North, Lady Loretta and X41 gas power station
 - Mica Creek and X41 gas power station generation assets
- MMG
 - Private transmission line from Chumvale substation to Dugald River Mine.

Private transmission asset ownership in the NWPS has several advantages and drawbacks as shown in Table 2-3.

Table 2-3: Advantages and disadvantages of private transmission asset ownership

Advantages	Disadvantages
Businesses are investing in the transmission infrastructure themselves, therefore cost recovery of these transmission investments is not reflected in the NWPS energy prices.	Private transmission asset ownership has meant that businesses do not maintain electrical infrastructure. There are also limitations surrounding the connection of upcoming major customers to the system, and upgrading the network to latest technologies is lacking.
Private transmission assets are independent of the price changes and effects of the other transmission network of the Queensland.	A strategy which facilitates the integration of private transmission assets into the NEM when CopperString connects is needed. Private transmission assets can either be added to Ergon or Powerlink’s regulatory asset base or continue to operate as private assets.

3 Opportunities and challenges in energy for Mount Isa

The impending closure of the MIM copper mine and copper concentrator, and the proposed CopperString development are catalysts for potentially significant transformation within the Mount Isa region. These drivers have exposed various opportunities and challenges for the region. These opportunities and challenges will be described based on the copper industry, critical minerals, the nature of the NWPS operations, existing and prospective energy supply, and Mount Isa's strategic geographic location in Queensland and renewable energy. These key aspects are explored in Table 3-1 below:

Table 3-1: Opportunities and challenges in energy for Mount Isa

Themes	Opportunities	Challenges
Copper industry	Capitalise on existing assets to maintain and grow copper mining and smelting operations.	Reducing the negative impacts of the MIM copper mine and concentrator closure in 2025.
Critical minerals	Region's mineral deposits are projected to generate a significant electricity demand, establishing it as a hub for innovation in the mining of critical minerals.	Maximising the economic potential while considering inflationary pressures, remoteness of mines and the cost of energy.
NWPS operation	Opportunity to restructure the NWPS committee to benefit and accommodate the changes in the region.	Isolated power system, unique structure of the NWPS committee, integration of the NWPS into the NEM.
Energy supply	Connection to the NEM creates new contracting opportunities for mining loads, and benefits existing energy consumers and other prospective customers in Mount Isa.	Lack of energy generation diversity and historical reliability issues.
Geographic location	Capitalising on Mount Isa's exceptional location as an intermodal logistics hub and provide renewable energy during peak times for the South East Queensland region through leveraging the time zone difference.	High costs, including for transport and utilities, as well as labour and housing shortages due to remote location.
Renewable energy	An abundance of natural resources, such as solar and wind, allows for the potential to convert Mount Isa into a renewable energy hub. This will enable for Mount Isa to achieve net zero, but also have additional energy supply in the region. Hydrogen development is also a potential opportunity for the region.	Overcoming the difficulties of connecting and having sufficient demand in the region to consume the additional supply.

3.1 Copper industry

Opportunity

Mount Isa has historically been at the forefront of both the national and international copper mining sectors. To continue thriving and sustainably expanding its role in the copper industry, the region should where possible leverage existing assets, including the smelter and transport infrastructure. These assets could provide a solid economic foundation for Mount Isa as it diversifies towards mining critical minerals, currently in high and growing demand.

Challenge

The announced closure of the MIM copper mine in 2025 and copper smelter in 2030 risks the collapse of the local copper industry. The MIM copper mine is the largest source of copper ore that is processed in the MIM copper smelter. MIM is the second largest producer in Australia¹¹ and has been the economic stimulant for the region. The uncertainty of retaining the specialised workforce and growing the economy will be the biggest challenge.

The copper smelter plays a crucial role in processing copper ore for several smaller mines in the Mount Isa region and has emissions used by Incitec Pivot that are essential for their processes. However, with the impending closure of the copper smelter, organisations that depend on it will explore other avenues to continue their operations. This shift may have adverse effects on the viability of these dependent consumers, potentially resulting in further job losses.

3.2 Critical minerals

Opportunity

The region's vast mineral resources, including copper, are essential for the global transition to clean energy. With an estimated \$500 billion in unexploited mineral resources, Mount Isa is well-positioned to meet the forecasted demand for minerals like copper, which is projected to reach 1.4 billion tonnes by 2050.

Mount Isa has a legacy of pioneering mining innovations, such as the Isa Process, ISASMELT, ISAMILL, and Jameson Cell technologies¹². The city's potential closure of iconic mining operations by 2025 presents an opportunity to focus on new technologies and practices that could solidify its future as a centre for mining innovation.

Challenge

There is significant global competition for investment in critical minerals, with major economies such as the United States and the European Union offering incentives to secure supply chains and support the decarbonisation of their economies¹³. This competition is geopolitical as well as economic, with nations seeking to maximise the benefits of critical minerals to address issues such as energy security and national security¹⁴.

Addressing these challenges will require strategic planning, investment, and possibly policy reform to ensure Mount Isa can effectively compete on the national and global stage and overcome the limitations posed by current barriers.

¹¹ [Mount Isa Mines Fact Sheet 2020.pdf \(minedocs.com\)](#)

¹² [Mount Isa Mines celebrates 100 years of operation \(australianminingreview.com.au\)](#)

¹³ [Seizing the opportunities for Australia's critical minerals | Ministers for the Department of Infrastructure](#)

¹⁴ [Critical Minerals: Global Supply Chains and Indo-Pacific Geopolitics | The National Bureau of Asian Research \(NBR\)](#)

3.3 NWPS operation

3.3.1 Islanded power system

Opportunity

Islanded power systems have several key advantages. Firstly, their isolation from the broader network provides immunity from external disruptions. For instance, blackouts in the broader network would not affect the islanded network and provides the opportunity to safely operate independently.

These systems also exhibit a higher degree of flexibility, allowing for efficient management and adaptation to changing conditions. As these systems are not connected to the NEM, they also have fewer prerequisites for new connections. This aspect not only expedites the connection process but also reduces associated costs, thereby providing a more cost-effective solution for stakeholders.

Another unique opportunity that an isolated network has is black start capability. This refers to the process of restoring an electric power station or a part of an electric grid to operation without relying on the external electric power transmission network. In the event of a total or partial shutdown, the quick black start capability is crucial to minimising downtime and restoring power supply swiftly.

Challenge

One of the critical challenges that an isolated network (such as NWPS) faces is maintaining system strength and stability. System strength relates to the ability of the system to manage rapid changes in power flows, maintain voltages, and withstand short-circuits. Stability services involve maintaining frequency within acceptable ranges and managing power quality issues.

The inherent characteristics of an isolated network can complicate the process of integrating renewable energy sources. This necessitates the implementation of spinning reserves or Battery Energy Storage Systems (BESS) to provide immediate power support. Such systems are particularly crucial and costly in mitigating the impact of generation fluctuations that may arise due to variable environmental conditions.

3.3.2 NWPS operational structure

Opportunity

The NWPS Dispatch Protocol is authorised until 2 April, 2025¹⁵. This presents a timely opportunity to review and potentially reform the Dispatch Protocol and the operational structure of the NWPS within the upcoming year.

A reformed Dispatch Protocol could be administered by Ergon Energy, the principal network asset owner of the NWPS, serving as an independent operator without generation or load asset ownership. The introduction of an independent operator of the NWPS could:

- Enhance the autonomy of network planning, design, and the connection process.
- Alleviate the administrative load on NWPS participants.
- Standardise the procedures for network operation as well as generation and load connection with those of the NEM and other isolated power systems.
- Reduce the uncertainty associated with connecting to the NWPS, owing to the above improvements.

A pathway for regulatory reform aimed at fostering increased competition within the NWPS is outlined in Section 5.2.1.

¹⁵ [ACCC grants conditional re-authorisation for participants within the North West Power System to agree to rules in the Dispatch Protocol | ACCC](#)

Challenge

The NWPS committee allocates the generation shares and the integration of new generation assets. The challenge with this extends to the structure of the power system committee, chaired by APA, as shown in Figure 2-6 above.

The network connection process is controlled by APA and may have barriers for new competitors seeking entry, as there are potentially cost, terms and conditions and approval process challenges.

Furthermore, the requirement for generators and major load representatives to partake in NWPS operations imposes an undue administrative and financial burden on businesses. Such responsibilities would typically fall under the purview of an independent market operator, like Ergon or AEMO. By contrast, the North West Interconnected System (NWIS) in Western Australia, which caters to the substantial mining demands of the Pilbara region, benefits from the governance of Horizon Power, a state-owned entity.

The perceived conflict in managing new generation connections, coupled with the administrative load shouldered by network participants, creates a complex and challenging business environment within the NWPS.

3.3.3 CopperString and NEM integration

Opportunity

To assist in the NWPS's integration to the NEM, a legacy clause (also known as 'grandfathering') could be implemented which would regulate certain assets based on older rules. Under an agreement, these assets would gradually transition to the new rules over a set period of time.

Issues relating to system strength support and back start services could be provided by existing generation assets, such as those owned by APA Group.

Challenge

In the case of CopperString, the process of integrating the NWPS into the NEM will need to be explored as various issues can arise when integrating an existing network. This is due to discrepancies between dispatch control, existing agreements, and NEM requirements such as updating existing connections to meet NEM standards.

CopperString's connection may also require:

- System strength support due to the location of the NWPS network being at the end of the NEM, connected by a long spur line.
- Black start capabilities in the case of CopperString encountering a fault (e.g. impacted by a cyclone).
- Sufficient demand in the region to reduce marginal loss factors and reduce energy prices.

3.4 Energy supply

Opportunity

Enhancing the NWPS with additional low-cost renewable energy sources, such as solar and wind, will lessen the region's reliance on gas. Encouraging new market entrants through a Renewable Energy Zone scheme will not only diversify energy generation but also expand contracting options. The potential of such a Renewable Energy Zone in Mount Isa is elaborated in Section 5.1.2.

The execution of CopperString would also enable additional connections to the NWPS, broadening the array of energy supply options available to customers.

There is also the potential to repurpose and upgrade the Carpentaria Gas Pipeline for hydrogen, which could serve future hydrogen production and export initiatives. For a detailed exploration of Mount Isa's hydrogen production prospects, refer to Section 5.1.3.

Challenge

There are three primary concerns for Mount Isa's energy supply:

- **Monopolistic control** – APA dominates the NWPS, owning:
 - The sole large-scale solar asset, Dugald River Solar Farm.
 - Key gas generation facilities: Diamantina, Leichhardt, and Thomson Power Stations.
 - The Carpentaria Gas Pipeline, which affects gas pricing for other generation assets.
- **Limited generation diversity** – An overreliance on gas as an energy source makes the region vulnerable to fluctuating gas prices, which have steadily risen since 2011 in Australia¹⁶.
- **Potential underutilisation** – The introduction of CopperString might lead to reduced use of the Carpentaria Gas Pipeline and gas generation assets if NWPS consumers secure energy from renewable sources or other generators outside Mount Isa.

3.5 Geographic Location

Opportunity

Although remote, there is opportunity to capitalise on Mount Isa's location between Darwin and Townsville, and South East Queensland more broadly. The development of an intermodal logistics hub would encourage economic growth within the region and help to support local businesses who would benefit from increased traffic through the city.

Mount Isa is situated where it has sunlight hours during the evening peak times in South East Queensland (SEQ) region. This creates an opportunity to shift energy generated by renewable energy (in particular, solar) from Mount Isa to help supply the peak loads in South East Queensland.

Challenge

The geographic location of Mount Isa is an important factor when considering economic development and investment within the region. Situated in the Northwest of Queensland, its remote location results in high costs associated with transport and utilities. This isolation also influences housing and labour shortages.

¹⁶ Gas market price trajectories for major population centres in Australia: [Gas market prices | Australian Energy Regulator \(AER\)](#)

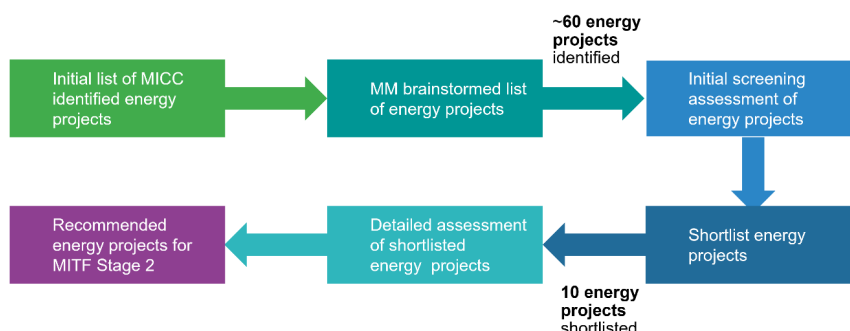
4 Energy projects assessment in Mount Isa

The assessment of energy projects within the Mount Isa region was first initiated through engagement with all relevant project stakeholders. Consistent communication with Council was prioritised, as was engagement with key energy players and the four other pillars involved in the project.

Through these various paths of communication and internal deliberation, all relevant energy options were identified, outlined in Figure 4-1 below. Following this, a screening assessment was conducted, rating each option using the RAG rating system against three key weighted criteria (Commercial Feasibility, Environmental Feasibility and Economic Development Potential). This assessment generated 9 shortlisted items: five for energy supply and four load projects.

The final stage of review involved a comprehensive evaluation of each option using a detailed assessment spreadsheet to highlight key points of interest for each project. Each shortlisted option was rated out of five in relation to five weighted criteria (Commercial Feasibility, Commercial Readiness, Ease of Implementation, Deployment Time, and Economic & Employment Potential). This detailed analysis generated overall scores for each option, assisting in presentation of recommendations and findings.

Figure 4-1: Options identification process



Source: Mott MacDonald

4.1 Stakeholder engagement

Engagement with all relevant project stakeholders was essential to determine the most viable energy options for the Mount Isa region. The four key stakeholder categories and their relevance to the project are outlined below.

4.1.1 Client engagement

To maintain consistent communication throughout the duration of the project, Mott MacDonald conducted weekly meetings with Council to provide project updates, ask questions to gain further insight, and receive feedback. There was also consistent engagement with the other four pillars in the form of monthly coordination meetings. In addition to this, each of the pillars were engaged individually to facilitate the identification of points of intersection, and share ideas to ensure the best possible outcome for Council. This is outlined in greater detail in Section 4.2.

4.1.2 Key energy players in Mount Isa

As APA are the owners of the majority of energy assets in the Mount Isa region, and are a generation representative for the NWPS committee, we prioritised open and constructive engagement to ensure we received insightful and constructive information from this key stakeholder. Ergon Energy were also engaged, as they are responsible for the management and maintenance of poles and wires for the NWPS. Powerlink Queensland were consulted, as they will own the transmission assets of CopperString once connected, and would likely play a key role in the energy development of Mount Isa.

4.1.2.1 Engagement with key energy users in Mount Isa

Network development is largely driven by load rather than generation, with a majority of the load on the NWPS attributed to the mining sector. We engaged a number of demand-side stakeholders in the NWPS and Mount Isa region who had existing connection or were looking to connect:

- Glencore
- North West Phosphate
- Incitec Pivot
- Harmony Gold
- Mount Isa Water Board.

These companies are drivers of investment in the network, as additional load on the network prompts generators to respond to this demand. The two main constraints of operation are energy and water. The energy component is concerned with cost and reliability, issues that stakeholders who consume energy would like to see addressed as it can greatly impact their bottom line.





4.1.3 Engagement with potential energy generators in Mount Isa

The final stakeholder engagement activity involved contacting the prospective generators of the shortlisted energy options for Mount Isa. Communication with these organisations enabled a thorough and effective assessment of all options which is outlined in Section 4.5.

4.2 Coordination with other economy transformation pillars

To ensure the best possible outcome for Council, monthly coordination meetings were held with the other four pillars, in addition to meeting with the pillars individually. Through this consistent coordination, points of intersection were identified which provided further insight into the energy landscape within the Mount Isa region. Points of intersection are shown in Table 4-1.

Table 4-1: Energy as a solution for the needs of Mount Isa’s future economy pillars

	Agriculture 	Critical Infrastructure 	Resources 	SME 
Identified need¹⁷	<ul style="list-style-type: none"> Cheaper power and reduced reliance on diesel generation for pastoralists 	<ul style="list-style-type: none"> Strong, reliable power network Improved fibre optic connection Improved logistics 	<ul style="list-style-type: none"> Diversity and competition in power supply Low emissions energy to meet safeguard mechanism requirements 	<ul style="list-style-type: none"> Diversification of the local education and career pathways away from resources
Energy as a solution	<ul style="list-style-type: none"> Modular solar installations 	<ul style="list-style-type: none"> Connection to the NEM via CopperString Future ready EV logistics hub 	<ul style="list-style-type: none"> Connection to the NEM and wholesale energy contracts via CopperString Increased renewable energy penetration in NWPS 	<ul style="list-style-type: none"> Expansion of the electro-mechanical course to include solar and HV line construction
Actionable next steps	<ul style="list-style-type: none"> Collaboration with innovation centres to develop modular solar solutions 	<ul style="list-style-type: none"> Make a start on any required environmental permits/approvals to increase readiness for CopperString Explore the integration of EV infrastructure into the logistics hub development 	<ul style="list-style-type: none"> Make a start on any required environmental permits/approvals to increase readiness for CopperString Advocate for Federal and State Gov. to underwrite renewable generation projects in the NWPS 	<ul style="list-style-type: none"> Engage with TAFE for updates on the new electro-mechanical course Consult with other training agencies to identify any relevant energy courses

Source: Mott MacDonald

4.3 Identification of energy projects

The identification of energy projects was a two staged approach.

Stage 1

In stage 1, we held meetings with Council to gain further insight into the scope of the project. This provided important background context for the project and assisted in aligning the project steps with the objectives of Council.

¹⁷ Based on discussion and engagement with other Mount Isa City Council Pillar consultants.

Building on this and workshoping with internal subject matter experts, we identified a list of diverse ideas. In parallel, we developed an initial assessment framework to quantify the potential value of each option. Options were shortlisted for more rigorous evaluation in the second stage.

Stage 2

In stage 2, stakeholder engagement extended beyond the Mott MacDonald team, and we arranged meetings to liaise with relevant parties to understand their plans or initiatives for the Mount Isa region under consideration.

Finally, we undertook a strict evaluation of each option, considering factors such as commercial feasibility, commercial readiness, ease of implementation, deployment time and employment/economic potential. We then selected the most viable and impactful options for consideration in the next phase.

4.3.1 Long list of energy projects

After understanding the context and background of Mount Isa and engaging key stakeholders, we conducted an internal workshop to collaborate and generate a long list of potential projects within the energy context. Council also provided several options for the energy projects.

The list of projects was then shared with Council to seek their feedback and add potential projects. In total, over 60 projects were identified for the initial screening assessment phase. For the long list of ideas, refer to the attachment ‘MICC_Detailed Assessment Framework.xlsx’.

4.4 Initial screening assessment

The options analysis stage involved an initial screening assessment and a viable impact assessment. The initial screening eliminated any projects that were assessed as too difficult to implement or have minimal immediate impact on Mount Isa’s economy transformation. The shortlisted options from the initial screen assessment then progressed to the viable impact assessment.

4.4.1 Approach for initial screening assessment

Once an extensive list of options was identified, we conducted an initial screening assessment. Each option was assessed on three criteria: commercial feasibility, environmental feasibility, and economic development potential. The intent of this framework is to provide a uniform structure to screen and assess economic development options available to the Mount Isa region.

The process involved providing an indicative assessment rating (RAG rating system) based on the criteria assessment items outlined below, along with commentary as shown in Table 4.2 on the following page.

Table 4-2: Initial screening assessment template

Criteria	Weighting	Description	Assessment rating (RAG)	Assessment rationale
Commercial Feasibility	60%	Strategic constraints assessment of: <ul style="list-style-type: none"> The project financial cost (is it likely to be high or low costs) Ability for project to get funding 	R = Highly constrained A = Moderately constrained G = Limited to no constraints	Describe why the rating was chosen (to be complete when assessing projects)

Criteria	Weighting	Description	Assessment rating (RAG)	Assessment rationale
		<ul style="list-style-type: none"> Maturity of core project technology 		
Environmental Feasibility	15%	Strategic constraints assessment of: <ul style="list-style-type: none"> Matters of State and National Environmental Significance Flooding and fire risk Renewable resource hosting capacity 	R = Highly constrained A = Moderately constrained G = Limited to no constraints	
Economic Development Potential	25%	Strategic constraints assessment of: <ul style="list-style-type: none"> Economic potential for Council Expected timeframe for when the project would be operational / commissioned Freehold land assessment 	R = No to little economic potential / Mid to long-term (after 2035) A = Some economic potential / Near-term (2026-2035) G = Plenty of economic potential / Immediate to short-term (before 2026)	

Source: Mott MacDonald

4.4.1.1 Weighting of options

The weighted score for each option is based on a score from 0 to 2 for each criterion. Descriptions of what each score means for the relevant criteria is outlined in Where,

- x = commercial feasibility score
- y = environmental feasibility score
- z = economic development potential score
- maximum score = 2

Table 4-3, and the overall weighted score is calculated using the below equation:

$$\text{Weighted score} = \frac{x \times 60\% + y \times 15\% + z \times 25\%}{\text{maximum score}}$$

Where,

- x = commercial feasibility score
- y = environmental feasibility score
- z = economic development potential score
- maximum score = 2

Table 4-3: Weighted Score Criteria

Rating / Score	Commercial Feasibility	Environmental Feasibility	Economic Development Potential
R = 0	Low feasibility	Highly constrained	Little to no economic potential / mid to long term (after 2035)
A = 1	Moderate feasibility	Moderately constrained	Some economic potential / near term (2026-2035)
G = 2	High feasibility	Limited to no constraints	Plenty of economic potential / immediate to short-term (before 2026)

4.4.2 Identified projects for detailed assessment

Of the over 60 projects, nine energy projects were selected from the initial screening assessment for shortlisting. The selected projects were the projects with the highest rating. The five shortlisted energy supply projects were all renewable energy options, while the other four are load projects (see Table 4-4 below).

Table 4-4: Shortlisted energy projects

Project Type	Lead Organisation	Energy projects
Supply	APA	Solar Extension and Battery Storage
Supply	Harmony Gold	Solar + Diesel + Battery Storage
Supply	Someva	Wind Project
Supply	Neoen	Wind Project
Supply	Green Gravity	Gravity Energy Storage Systems in mine shafts
Demand	Council	Transport Ecosystem
Demand	Incitec Pivot Limited	Connection to NEM
Demand	Harmony Gold	Connection to NEM
Demand	Ergon	Microgrids at Regional Townships

Energy as an enabler for the region requires new developments in both supply and demand. Generation of renewable energy is critical to the transition to net-zero, contributing to increased energy security and lower prices, while demand will be required in order to stimulate a circular economy. This economic development would be greatly benefited by the integration of the NWPS into the NEM via CopperString, where investment in infrastructure will be essential for this transition. Connection to the NEM would also assist in the establishment of a REZ in Mount Isa and would provide a multitude of benefits. These benefits include the lowering of electricity costs, attracting investment and facilitating development which would thus generate new employment opportunities. Further details will be outlined in Section 4.5.2.

4.5 Detailed assessment

4.5.1 Approach and detailed assessment framework

The shortlisted options were analysed in greater detail using a detailed assessment spreadsheet to determine the most viable and most impactful projects to proceed with Phase 2: Execution.

The assessment framework is underpinned by five key criteria:

- Commercial Feasibility (CF)
- Commercial Readiness (CR)
- Ease of Implementation (EI)
- Deployment Time (DT)
- Economic & Employment Potential (EEP).

Each criterion has at least three sub-criteria which represent the key areas of interest for assessment, enabling a comprehensive analysis (see Table 4-5).

The options are then rated numerically based on the five key criteria. The most viable and impactful projects will be selected to proceed with the business case development and detailed design for implementation.

Table 4-5: Detailed assessment template

Criteria	Sub-criteria	Weighting	Assessment rating (Out of 5)	Assessment rationale
Commercial Feasibility (CF)	CF1: Profitability or viability of the project	40%	1 – Low feasibility. 2 – Low-to-moderate feasibility. 3 – Moderate feasibility. 4 – Moderate-to-high feasibility. 5 – High feasibility.	Describe why the rating was chosen (to be complete when assessing projects).
	CF2: Estimated CAPEX evaluations			
	CF3: Supply chain considerations (Ability to source assets and construction assets)			
	CF4: Funding availability			
Commercial Readiness (CR)	CR1: Technology Readiness Level (TRL), including the technology maturity and scale of implementation	20%	1 - Significant regulatory/policy barriers & TRL < 6. 2 - Significant regulatory/policy barriers or TRL < 6. 3 - Limited regulatory/policy barriers & TRL < 9. 4 - Limited regulatory/policy barriers or TRL < 9. 5 - No regulatory/policy barriers & TRL < 9.	
	CR2: Policy enablers of or barriers to commercialisation			
	CR3: Regulatory constraints or opportunity for commercialisation.			
Ease of Implementation (EI)	EI1: Land tenures	15%	1 – Crown land, does/does not require Native Title approval with constrained resource availability. 2 – Crown land, does require Native Title approval with good resource availability. 3 – Crown land, does not require Native Title approval with good resource availability. 4 – Freehold land with constrained resource availability. 5– Freehold land with good resource availability.	
	EI2: Resourcing availabilities			
	EI3: Native Title holders’ approval			

Criteria	Sub-criteria	Weighting	Assessment rating (Out of 5)	Assessment rationale
Deployment Time (DT)	DT1: Permit and approval timeframe	10%	1 – > 10 years deployment time. 2 – 5.5 – 10 years deployment time. 3 – 4.5 – 5.5 years deployment time (before 2030, Copper Smelter closure). 4 – 1.5 – 4.5 years deployment time (before 2029, CopperString). 5 – Less than 1.5 years (before 2026) deployment time.	
	DT2: Expected procurement lead times			
	DT3: Commissioning timeframes			
Employment and Economic Potential (EEP)	EEP1: Job opportunity	15%	1- Short term economic outcomes; limited opportunities to value add; limited opportunities for inclusive for inclusive opportunities; long/complex path to socio-economic development value realisation 3- Mixture of short-term and long-term opportunities; moderate opportunities to value add; moderate opportunities for inclusive opportunities; moderate path with some complexity to socio-economic development value realisation. 5- Long-term, permanent economic outcomes; significant opportunities to value add; significant opportunities for inclusive for inclusive opportunities; short/direct path to socio-economic development value realisation.	
	EEP2: Ability to upskill local workforce			
	EEP3: Opportunities for local industry inclusion			
	EEP4: Economic growth potential			
	EEP5: First Nations involvement			
	EEP6: Ability to include vulnerable populations (long-term unemployed & youth etc.) in the workforce			
	EEP7: Contributing to net zero transition			
	EEP8: Ability to enable copper smelter operations			
	EEP9: Ability to justify and capitalise CopperString			

Source: Mott MacDonald

4.5.1.1 Weighting of Options

The weighted score for each option is based on a score from 1 to 5 for each criterion. Descriptions of what each score means for the relevant criteria is outlined in Table 4-6, and the overall weighted score is calculated using the below equation:

$$\text{Weighted score} = \frac{CF \times 40\% + CR \times 20\% + EI \times 15\% + DT \times 10\% + EEP \times 15\%}{\text{maximum score}}$$

Where,

- CF = Commercial Feasibility score
- CR = Commercial Readiness score
- EI = Ease of Implementation score
- DT = Deployment Time score
- EEP = Employment and Economic Potential score
- Maximum score = 5

Table 4-6: Weighted Score Criteria

Rating / Score	Commercial Feasibility	Commercial Readiness	Ease of Implementation	Deployment Time	Employment and Economic Potential
1	Low feasibility.	Significant regulatory/policy barriers and TRL < 6.	Crown land, does/does not require Native Title approval with constrained resource availability.	> 10 years deployment time.	Short term economic outcomes; limited opportunities to value add; limited opportunities for inclusive for inclusive opportunities; long/complex path to socio-economic development value realisation.
2	Low-to-moderate feasibility.	Significant regulatory/policy barriers or TRL < 6.	Crown land, does require Native Title approval with good resource availability.	5.5 – 10 years deployment time.	Between 1 and 3.
3	Moderate feasibility.	Limited regulatory/policy barriers and TRL < 9.	Crown land, does not require Native Title approval with good resource availability.	4.5 – 5.5 years deployment time (before 2030, Copper Smelter closure).	Mixture of short-term and long-term opportunities; moderate opportunities to value add; moderate opportunities for inclusive opportunities; moderate path with some complexity to socio-economic development value realisation.
4	Moderate-to-high feasibility.	Limited regulatory/policy barriers or TRL < 9.	Freehold land with constrained resource availability.	1.5 – 4.5 years deployment time (before 2029, CopperString).	Between 3 and 5.
5	High feasibility.	No regulatory/policy barriers and TRL < 9.	Freehold land with good resource availability.	Less than 1.5 years (before 2026) deployment time.	Long-term, permanent economic outcomes; significant opportunities to value add; significant opportunities for inclusive for inclusive opportunities; short/direct path to socio-economic development value realisation.

4.5.2 Identified projects for the Mount Isa Transition Fund and Phase 2 – Execution

Nine projects were identified for the Mount Isa Transition Fund Stage 2; five of which are supply projects and four demand operations. Each option and the corresponding overall rating is listed in Table 4-7 below. A detailed description highlighting the key points of interest for each option is outlined below.

Table 4-7: Identified Projects

ID	Lead Organisation	Energy Project	Description	Rating
S1 / S3	APA	Battery Storage &	Adding a 55MW / 80MWp solar extension to the existing Dugald River solar farm & the addition of 50MW / 100MWh of battery storage.	4.15

ID	Lead Organisation	Energy Project	Description	Rating
		Solar Extension		
S2	Harmony Gold	Solar + Diesel + Battery Storage	The implementation of a 50MW solar + diesel + battery storage system at a cost of \$250m.	3.55
S4	Someva	Wind Project	A wind farm project with generation capacity between 150MW and 230MW. The proposed site is located 7km east of Mount Isa City.	2.85
S5	Neoen	Wind Project	A wind energy proponent to be located 30km east of Mount Isa	2.6
S6	Green Gravity	Gravity Storage Systems in mine shafts	Repurposing up to 15 MIM Copper Mine underground shafts as Gravity Energy Storage Systems (GESS) to produce between 2-2.5GWh of energy storage.	3.5
D1	Council	Transport Ecosystem	Creating a transport ecosystem enabling Mount Isa to be the central connection point between QLD and NT. This project focusses on the incorporation of EV and hydrogen charging stations.	3.05
D2	Incitec Pivot	Connection to NEM	Phosphate Hill Project wants to connect to the NEM to enable expansion keep up with their company's decarbonisation policy. The plant is currently powered by an onsite gas plant.	3.05
D3	Harmony Gold	Connection to NEM	Connecting a new mine to the NEM via CopperString to enable expansion and decarbonise through renewables.	3.05
D4	Ergon	Microgrids at Regional Townships	The implementation of microgrids at regional townships (Doomadgee, Burketown & Camooweal). These townships currently run on diesel.	4.05

(S1/S3) APA battery storage and solar extension

APA is currently assessing the viability of a 50MW / 100MWp battery storage system to store excess energy from the current 88MW solar farm and new 55MW / 80MWp solar farm extension. At this stage, the solar expansion and battery integration option for APA are well-progressed. With the success of the first phase of the solar farm, APA have identified the requirement for expansion and the market and supply potential with battery integration.

Figure 4-2: APA solar farmSource: APA Group¹⁸

It is worth noting that the approval is lengthy, and the deployment may take two years. This project would require 100-150 full time construction jobs and 2-4 ongoing positions within Mount Isa, with opportunities for local industry inclusion and upskilling the local workforce. [The final investment decision on this project is expected to be made in June of 2024, and APA at this stage does not require investment support.](#)

(S2) Harmony Gold solar + diesel + battery storage

The second supply option is to support Harmony with their energy requirements through funding for their onsite 50MW power generation worth approximately \$250m. This option is to be seriously considered as it is a major development in the region with potential job generation of 800 positions during the construction phase and 400 ongoing operational jobs. With the overall goal of connection to the NEM through CopperString, onsite generation was deemed to be the only economically feasible alternative in order to expedite operations. [The company would consider using solar and gas as an option in the short term with support from the State.](#)

Figure 4-3: Representative solar + diesel + battery systemSource: Engineers Australia¹⁹¹⁸ <https://www.apa.com.au/news/opinion-articles/2023/decarbonising-australias-resources-sector/>¹⁹ <https://createdigital.org.au/remote-town-energy-pinnacle/>

(S4) Someva wind farm

Someva Mount Isa Wind Farm is a proposed development located 7km east of Mount Isa City. With an estimated CAPEX of \$500m, the farm will be capable of generating between 150-230MW of power, utilising the abundant wind resources in the area.

Figure 4-4: Proposed location

Source: Someva²⁰

The project will create over 100 full-time construction jobs over a two-year period, and 20 ongoing operation and maintenance positions utilising local industry with opportunities to upskill the local workforce. Although the economic growth potential of this project is promising, a key barrier to its success lies in the pathway to the market and the need to have shared ownership with an offtaker in order to 100% firm. **Someva is also looking to have the government underwrite the project in order to address uncertainty and risk associated with a lack of an offtake agreement.**

(S5) Neoen wind farm

The Neoen wind farm project is part of 'ReNW', a partnership between Neoen and Cleanco, which is exploring the delivery of a wind, solar and battery project as a part of a REZ within the NWMP. A REZ would potentially benefit the region through lowering electricity costs, facilitating development, employment opportunities and attracting investment.

The Neoen wind farm component would be located 30km east of Mount Isa City, generating up to 200MW of power and potentially providing up to 200 construction jobs and 6 ongoing positions during operation. Although this project would be viable with CopperString, profitability will likely be impacted due to competition with the Hughenden REZ wind farms once connected to the NEM. In order to progress with the project, **Neoen is seeking clarity surrounding the region's expected demand and how CopperString will impact this. Further information on the role of variable generation on the NWPS would also benefit progress.**

Figure 4-5: Representative Wind Farm

Source: Collgar Renewables²¹

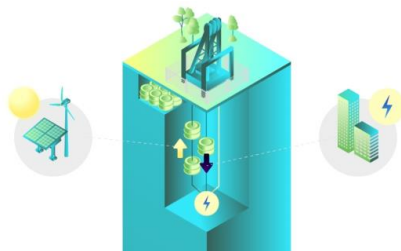
²⁰ <https://www.somevarenewables.com.au/project/mount-isa/>

²¹ <https://www.collgar.com.au/>

(S6) Green Gravity energy storage

Green Gravity are proposing to repurpose MIM Copper Mine underground shafts as Gravity Energy Storage Systems (GESS) with an estimated CAPEX of \$900m over several years. At this stage, the company has identified 15 mine shafts which could be converted to provide 2-2.5GWh of storage creating up 350 jobs during construction, and 20-50 full-time positions during operations. The project would take the following staged approach:

- Stage 1 (2025-2027) – 250MWh
- Stage 2 (2027-2029) – 500MWh
- Stage 3 (2029-2033) – 1500MWh

Figure 4-6: Gravity storage systemSource: Green Gravity²²

A key challenge to consider is the readiness of this technology. Although most components for Green Gravity will be high on the technology readiness level (TRL) scale, many of the sub-systems have a range of TRLs on the lower end of the scale with the company expected to advance this rating in time for commercial deployment. [Policy stewardship from planning departments and/or mining regulators regarding the conversion of legacy mining assets into GESS would greatly assist the project implementation timeframe.](#)

(D1) Mount Isa City Council Transport ecosystem

Council are considering the establishment of a transport ecosystem in Mount Isa City which would enable the city to be a central connection point between Queensland and the Northern Territory. Specifically, the assessment of this option focused on the incorporation of EV and hydrogen charging stations into a logistics hub, as well as the production of heavy and commercial vehicles used for mining operations, (e.g. Fuel Cell Electric Vehicles). A transport hub would assist in generating demand for the new renewable energy supply, stimulating a circular economy, and contributing to economic diversification away from a sole reliance on the mining sector.

Figure 4-7: Representative hydrogen charging stationSource: Heavy Vehicle Industry Australia²³²² <https://greengravity.com/>²³ <https://hvia.asn.au/renewable-hydrogen-hub-unveiled-for-north-queensland/>

(D2) Phosphate Hill Connection to NEM**Figure 4-8: Phosphate Hill**Source: Phosphate Hill²⁴

The Phosphate Hill manufacturing plant operated by Incitec Pivot is currently powered by an onsite gas plant but is looking to connect to the NEM. This connection would allow for facility expansion, leading to job creation, and would further the company's efforts to decarbonise. Although connection would not occur until 2029 during the latter stages of CopperString, this would provide sufficient time to allow for the procurement of critical items with long lead times. **In addition to this, Incitec Pivot will need government certainty to connect.**

(D3) Harmony Gold Connection to NEM

Harmony Gold are in the process of establishing the new Eva Copper Mine Project, located 95km North East of Mount Isa. The CAPEX required will depend how the mine is connected to the NEM, with the two leading options outlined below:

- Option 1: Connect the MMG owned substation and construct an 11km line from the SS to the project site
- Option 2: Construct a new transmission line from the project site to Cloncurry

Similar to option D2, connecting to the NEM would allow Harmony Gold to expand their operations, leading to long term job creation and upskilling of existing workforces. **Harmony Gold will also require certainty from the Government to further expand their operations.**

Figure 4-9: Representative QLD Copper MineSource: Glencore²⁵²⁴https://www.incitecpivot.com.au/~/_media/Files/IPL/Work%20with%20us/phosphate_hill_leaflet.pdf²⁵ <https://www.glencore.com.au/operations-and-projects/qld-metals/resourceful/resourceful-may-2021/ernest-henry-mine-on-the-way-to-safer-drill-and-blasting>

(D4) Ergon regional microgrids

Figure 4-10: Representative microgrid



Source: Horizon Power²⁶

The final demand option is the establishment of multiple microgrids at regional townships. Possible locations include Doomadgee, Burketown and Camooweal, all of which are currently powered by diesel generation. Microgrids would improve the reliability and security of supply to these regional townships. Even if the CopperString connects to Mount Isa, these regional places would likely remain too far to connect to the NEM. The development of these projects may obtain funding from the ARENA Regional Microgrids Program, increasing economic viability of the microgrids.

4.5.3 Development risk and mitigation

Several risks have been identified that are associated with the development of each project, and could negatively impact employment, energy prices and economic growth in the Mount Isa region. Significant risks that may affect a range of projects are highlighted below in Table 4-8. Each risk has a rating of Low (L), Medium (M) or High (H), and a relevant mitigation plan.

Table 4-8: Development risks

Item	Risk	Risk Implication/Impact	Risk rating	Mitigation plan
All	CopperString does not go ahead	Connection to the NEM would not be possible, limiting new job opportunities and potentially reducing economic growth and diversification.	M	There will need to be strong, coordinated advocacy from industry and Council for CopperString. It would also be beneficial to ensure that there is dual purpose in the projects that get developed (i.e., suited for both NEM SAPS)
D2, D3	Lengthy procurement lead times for critical items	Some critical items needed for connection to the NEM may take up to five years, potentially slowing the connection process.	L	Identify items with long lead times and prioritise their acquisition.
All	Inadequate resources for local energy training/upskilling courses	Reduced opportunity for local industry inclusion for new developments, negatively affecting economic growth in the region.	M	Actively engage with TAFE and other training organisations to identify gaps in the training currently offered.
All	Lack of full-time job opportunities with new energy projects.	Unemployment due to Glencore mine closures may be sustained due to a lack of full-time positions available with new developments.	M	Council to engage with relevant companies to prioritise the local workforce for any employment opportunities

²⁶ <https://www.horizonpower.com.au/your-community/getting-future-ready/midwest-centralised-solar/>

Item	Risk	Risk Implication/Impact	Risk rating	Mitigation plan
S2, S4, S5, S6, D1, D4	Land acquisition barriers due to issues with land tenure types or Native Title holders' approval	An inability to secure land for new developments may drive away potential renewable energy investment in the area.	L	Develop an engagement management plan for energy development with Kalkadoon PBC. This could potentially promote co-ownership models. Create tailored development approval pathways for crown and pastoral leasehold land in partnership with State Government.
All	Hesitation from local business to participate in construction of new energy developments	Construction businesses from outside the Mount Isa region will need to be enlisted, leading to sustained unemployment.	H	Educate local businesses on the new developments within the Mount Isa region and how they can participate.
S1 – S6	Generation remains largely based on only a few generators	Energy prices will remain high due to lack of competition in the region	M	Instate a policy that will improve grid strength through increased competition, and encourage greater investment in renewables and mining, (see Figure 5-11).
All	Uncertainty on energy prices	<ol style="list-style-type: none"> 1. Uncertainty in electricity prices could impact a willingness to invest in new energy projects. 2. There is also future risk with the connection costs to CopperString and prohibitive marginal loss factor (MLF) 	M	<ol style="list-style-type: none"> 1. Reshaping the Community Service Obligation (CSO) & offer green loans or other financial/planning incentives to encourage investment, which will thus be recovered through the NWMP resources boom (see Figure 5-11). 2. Create demand to minimise the connection costs and prohibitive marginal loss factors
S1-S6	Uncertainty over the connections and curtailment process	Without an established regulation on the connection and curtailment process, all customers willing to connect renewable energy in Mount Isa will inherently be at risk	H	Develop regulations to remove uncertainty of connection and curtailment process
S1-S6	Curtailment of additional renewable energy in the region	With circa 50% of the demand reduction through the closure of the Glencore copper mine and concentrator, the power station may need to reduce their contracted supply, and there may be curtailment with the additional renewable energy in the region	H	Create demand in the region to create a balance in supply and demand. This will stimulate the economic development in Mount Isa

Mott MacDonald | Diversification and Transformation of the Mount Isa Economy: Energy
 Response to the closure of the Mount Isa Copper Mine

Page 40 of 75

Item	Risk	Risk Implication/Impact	Risk rating	Mitigation plan
		even with CopperString due to the system strength challenges		

May 2024

Mott MacDonald Restricted

5 Recommendations and findings

The detailed assessment of all identified energy developments in Mount Isa revealed three projects for the Mount Isa Transition Fund (Stage 2):

1. Harmony Gold solar + diesel + battery storage (S2)
2. Someva wind farm (S4)
3. Green Gravity energy storage (S6)

These projects scored highest due to their potential to support employment transitions, upskill vulnerable populations, and contribute to economic growth.

Several medium to long term opportunities were also revealed through stakeholder consultation (see Table 5-1 below):

Table 5-1: Medium-long term opportunities

Medium-long term opportunities	Summary
CopperString	<ul style="list-style-type: none"> • CopperString is poised to be a transformative economic stimulus for Mount Isa, offering a regulated energy market, reliable supply, and opportunities for renewable energy development and hydrogen storage. Uncertainty still remains in the NWPS however, as to whether Powerlink will follow through with development from Townsville to Mount Isa. • It is essential for the advancement of renewable energy and regional load-side development that the CopperString project progresses as envisioned. Council's advocacy efforts are crucial and should be actively pursued to facilitate the successful realisation of CopperString's potential.
Renewable Energy Zone	<ul style="list-style-type: none"> • The Mount Isa region in Australia, rich in natural resources and infrastructure, faces high energy costs and low supply reliability due to its isolation from the Queensland super grid and the NEM. The proposed CopperString project aims to connect the region to the NEM, reducing energy costs and stimulating economic growth by unlocking renewable energy potential and attracting investments. • Despite its advantages, Mount Isa is not identified as a Renewable Energy Zone (REZ) in the Queensland government's roadmap, which highlights the need to consider its establishment for the region's technical, economic, social, and environmental benefits. • Council should engage State Government and Powerlink to push for the establishment of a REZ in the Mount Isa region.
Hydrogen	<ul style="list-style-type: none"> • The region's high solar irradiance and wind speeds facilitate green hydrogen production, which can be used for energy storage, power generation, and as a carbon-neutral fuel for industries and exports. • Hydrogen can strengthen the local power supply and serve as a backup during critical failures, addressing Mount Isa's energy reliability issues. • The viability of a hydrogen hub depends on available land, renewable power, water, and nearby hydrogen offtakers. The region has suitable infrastructure and a potential hydrogen demand of 229,000 TPA from various sectors. • Establishing a hydrogen hub could create jobs, upskill the workforce, and provide educational opportunities, contributing to the socio-economic development of Mount Isa.

Policy advocacy	<ul style="list-style-type: none"> • The current committee-based system, dominated by APA, hinders competition, suggesting a need for Ergon to assume an independent operator role, fostering transparency and competition. This shift, drawing inspiration from similar networks, would simplify NWPS's integration into the NEM, especially if CopperString doesn't proceed. A strategy to transition responsibilities to Ergon, engaging with ACCC, and develop a roadmap with AEMO for NWPS's NEM integration. • To ensure sustainable development in Mount Isa, it is crucial to diversify the region's economy beyond mining by embracing renewable energy. Implementing policies that encourage investment in both mining and renewables will create a balanced supply-demand ecosystem. Key strategies include establishing a robust energy investment framework, incentivising green loans, and enhancing grid infrastructure. These measures will not only create jobs and support the workforce but also promote social inclusion and benefit First Nations communities, maximising Mount Isa's natural assets.
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5.1 Medium to long term opportunities

5.1.1 CopperString connection

5.1.1.1 Feedback from industry

Harmony Gold

In the case of Harmony Gold and their proposed development of the Eva Copper Mine, there is a preference for an ability to utilise grid power at equivalent pricing of the NEM, possibly through an electricity cost equalisation mechanism. Project economics have also been significantly impacted by late-2023 changes to safeguards mechanism thresholds and diesel generated power charges. Due to this, Harmony requested that there be support for a Safeguard Mechanism holiday for the project, and a fixed network tariff for CopperString during the initial period after commissioning.

Incitec Pivot

To assist in the connection of Phosphate Hill to CopperString, there will need to be explicit political support for the southern link, and recognition of the existence of economic interdependencies of all major operations in Mount Isa. Assurance that all operators will receive reliable power from the NEM is also necessary, as this was originally intended by Copperstring. In order for this to occur, the scope of the project would need to include the southern link, however Powerlink's current focus on infrastructure poses a barrier to this as they are neglecting customer connections for the northern and southern links. This could risk excluding some customers and may not support the growth of North West Queensland's economy through affordable power.

North West Phosphate

North West Phosphate are looking to expand operations within the Mount Isa region, but subject to the connection of CopperString. North West Phosphate's main concern is access to both energy and water. Regarding the energy component, the challenges are the cost effectiveness and reliability of energy, amongst other factors, for North West Phosphate to expand. There is substantial potential to expand from 1 million tonnes per annum of high-grade phosphate to approximately 2 million tonnes per annum ²⁷, if the right conditions enable them to do so.

²⁷ Quoted by North West Phosphate in the stakeholder engagement on the 5th of Feb. 2024

Energy developers

There have been mixed responses from energy developers with respect to the connection of CopperString. Comments received include:

- CopperString will benefit our business case due to increased offtake market.
- Copperstring will negatively impact our business case due to increased competition from other renewable energy sources (particularly Hughenden REZ).

5.1.1.2 Catalyst for economic stimulus

CopperString will enable for Mount Isa to connect to the NEM. NEM connection would provide the Mount Isa region with a regulated energy market for customers, increased reliable and secure supply, and increased supply capacity. Existing customers have already expressed their strong interest in connecting the transmission lines, and potential new customers have been more inclined to connect to the region as well.

CopperString offers the opportunity for renewable energy developers to construct and contribute to the supply of renewable energy. Other opportunities include utilising excess renewable energy or draw energy from the grid to store energy in batteries, and in the form of renewable hydrogen. The hydrogen could then be used for a variety of end uses, including on and off-road transportation, industrial processes, such as ammonia production, and to augment general gas system supply. CopperString will be one of the key drivers to the future of Mount Isa's transformation and diversification economy. Further details are outlined in the subsequent sections.

The framework in Figure 5-1 shows the potential impacts that CopperString could have on the region collectively. The requirements to get CopperString connected are also listed. Although it is planned for CopperString to connect to Mount Isa, there is uncertainty on whether this will proceed due to economic viability. Powerlink is also still deciding on whether the 'Southern Spur' line will be constructed to connect areas such as Phosphate Hill, located south of Mount Isa and Cloncurry.

Figure 5-2 demonstrates the key considerations, risks, and opportunities if CopperString was to be connected into Mount Isa. These assessments will need to be explored further to completely understand the impacts on Mount Isa and the NWPS.

Figure 5-1: Impact of CopperString connection on Mount Isa's future economy

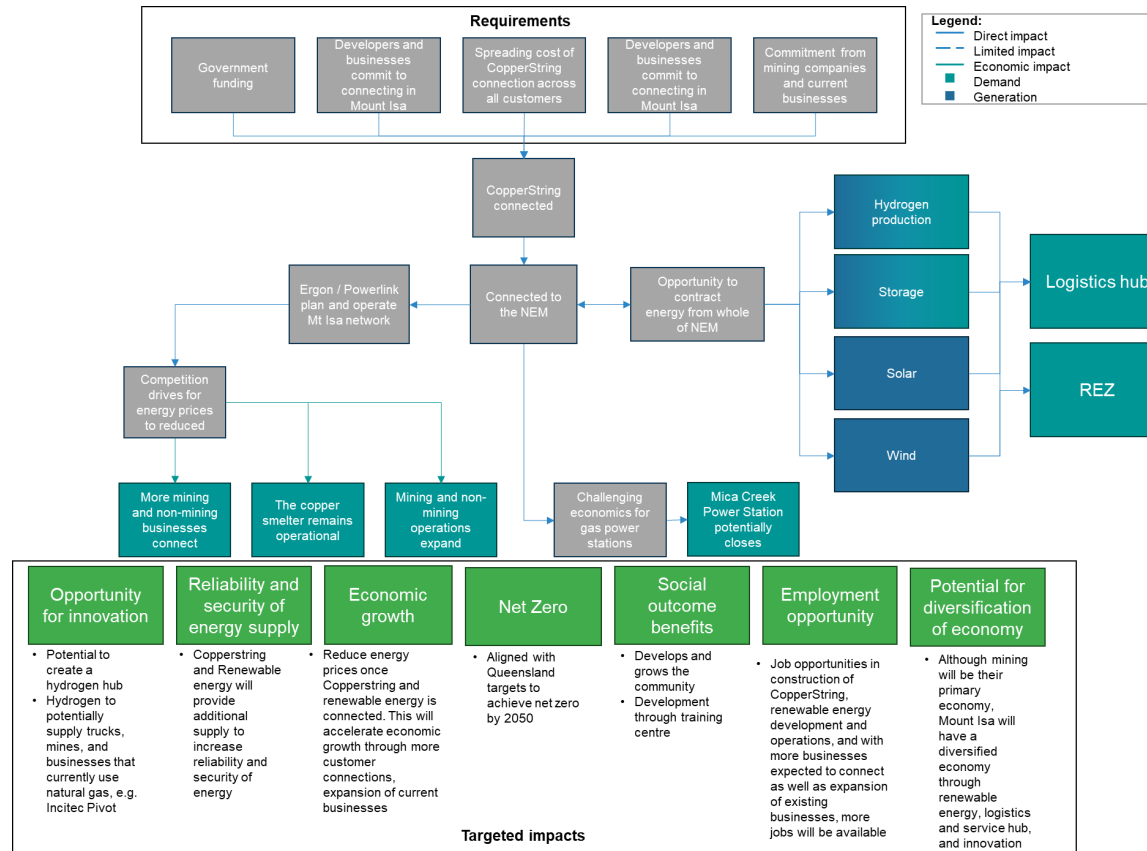


Figure 5-2: Considerations, risks and opportunities for a CopperString connected future

Considerations	Risks	Opportunities
<ul style="list-style-type: none"> • To connect CopperString to Mount Isa, the business case needs to be justified from the Government/Powerlink perspective. This can be achieved through: <ul style="list-style-type: none"> • Significant interest from developers, small and medium businesses, etc. to connect in Mount Isa • Government funding to help subsidise the costs • Spreading the cost across all CopperString participants • Supporting delivery of non-financial and indirect benefits for Copperstring, such as net zero transition, employment opportunity, security of supply and resilience of network • Policy and regulations decisions will be critical to the CopperString impact on Mount Isa and on the region • Existing connections will have to upgrade to NEM requirements 	<ul style="list-style-type: none"> • Not enough demand to make it viable • Customers don't connect, and existing businesses leave • Could lead to over reliance on CopperString line 	<ul style="list-style-type: none"> • If CopperString is connected, the region has the potential to prosper with a diversified economy • Mount Isa is strategically located in a regional area of Queensland, and connects the NT, SA and QLD. Copperstring will enable Mount Isa to capitalise on this location • The mining businesses in Mount Isa have supply chain benefits for the rest of the corridor to Townsville. There is significant economic potential for Queensland, and Australia, including export opportunities. • Encouraging private investment to meet Net Zero targets • Strengthening economic and political connection to east coast

5.1.2 Mount Isa Renewable Energy Zone

Economic development in the Mount Isa region can be sustained through supportive economic regulation of the power system, such as a REZ.

The Mount Isa region, including Mount Isa, Cloncurry, and Julia Creek, is home to an abundance of natural resources (including critical minerals), existing mining operations, a strategic logistics location between Queensland and Northern Territory, good solar and wind resources, land availability, existing infrastructure including rail and gas networks, and an existing power system including generation.

Figure 5-3: Photovoltaic Power Potential of Australia

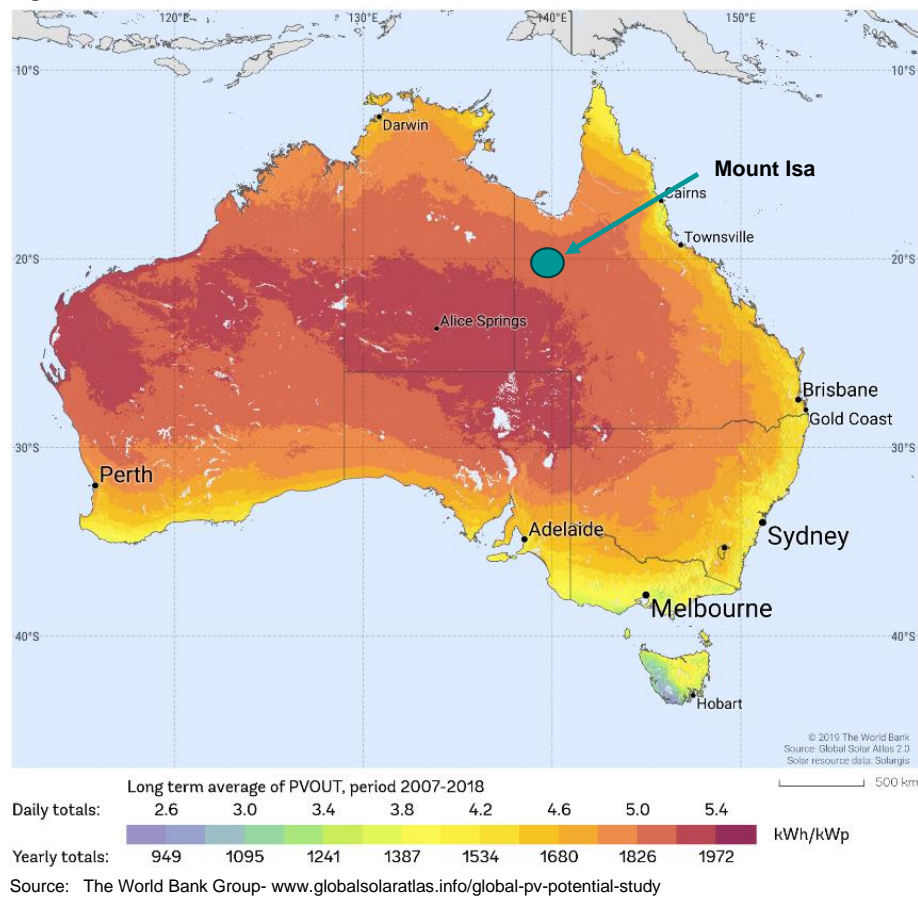
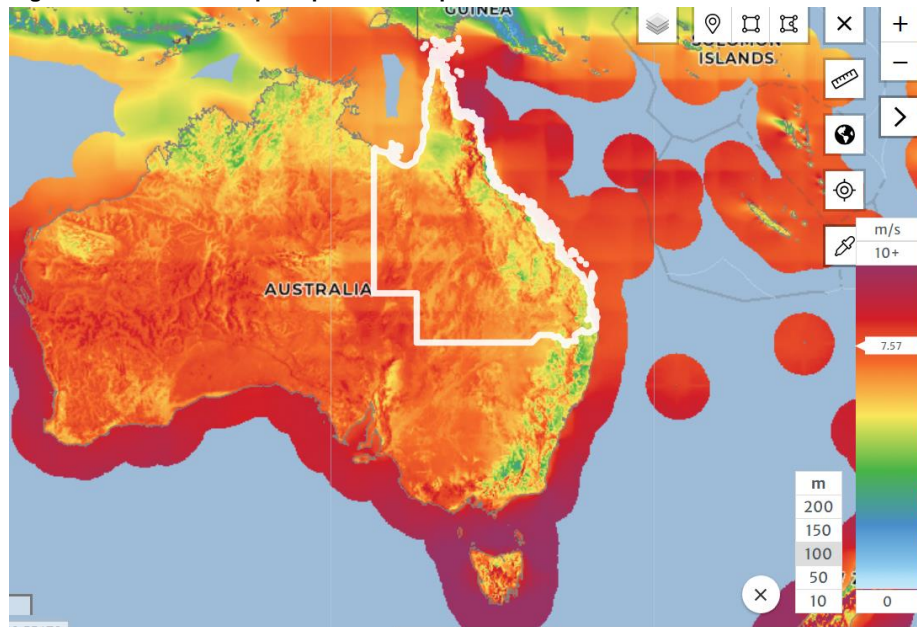


Figure 5-4: Mean wind speed/potential map of Australia



Source: Global Wind Atlas - [Global Wind Atlas](#)

The development and full utilisation of these critical resources and infrastructure is inhibited by being electrically isolated from the Queensland super grid and the NEM. As an isolated power system, supply of power in the region is characterised by high energy costs, low supply reliability, and monopolised power generation.

Establishing Mount Isa as a REZ would stimulate economic growth and development in the region through lower energy costs, increased capital investment and employment opportunities, as well as contributing to state and national decarbonisation and renewable energy objectives.

The existing NWPS is mainly served by gas fired generators and a limited number of solar power plants. Since the system is not connected to the NEM, the NWPS Dispatch Protocol has been established by agreeing to the regulation of technical and operational matters with the generators and its offtakes. This NWPS Dispatch Protocol is revised from time to time.

The CopperString project is a transmission infrastructure project proposed from Townsville to Mount Isa via Hughenden and Cloncurry. This transmission line will connect the NWMP to the NEM with the key purpose of serving as a vital power network backbone by addressing existing issues faced by industries and users in the NWMP. Key benefits include:

- **Industry Development:** The project will unlock industry development opportunities in the region.
- **Renewable Energy Integration:** It will allow for the integration of additional renewable energy sources from the Mount Isa area and other regions along the transmission corridor.
- **Local Load:** Existing mining operations, industrial facilities, and townships in the NWMP, along with future mining and industrial loads, will contribute to a localised load supplied with minimal network losses.

The Queensland Government published a roadmap for REZ development in the state, identifying 12 locations. These REZ locations aim to leverage the state’s abundant renewable energy resources, particularly solar and wind, to generate renewable energy. Three of these REZ locations are in North and Far North Queensland as shown in Figure 5-5.

Figure 5-5: Identified REZs in North and Far North Queensland



Source: Queensland Renewable Energy Zone Roadmap- March 2024

Despite the Mount Isa region’s advantages and opportunities in relation to renewable energy, the region was not identified as a REZ in the roadmap. The closest identified REZ to the Mount Isa region is the Flinders REZ which is approximately 500km to the east of Mount Isa.

Establishing a REZ in the Mount Isa region has the potential to deliver technical, economic, social, and environmental benefits.

5.1.3 Hydrogen hub blueprint

5.1.3.1 Overview

Green hydrogen, or renewable hydrogen, is receiving considerable attention as a potentially valuable low carbon fuel and energy storage medium, particularly as the world decarbonises out to mid-century. The cost-effective production of green hydrogen requires access to cheap and plentiful renewable energy resources as well as water. The hydrogen industry remains in the

early stages of project demonstration. A limited number of projects have reached final investment decisions²⁸ and only small-scale operating hydrogen production and refuelling stations are operating in Australia²⁹.

The Mount Isa region is well-positioned with the natural resources that could support a hydrogen production hub, although a number of challenges and issues would need to be addressed to realise the potential for hydrogen production in the region.

This subsection provides an overview of the technical and practical considerations to implement a hydrogen production hub, including the production process, supply chain, infrastructure requirements, and socio-economic benefits. Implementation pathways, a road map, and the direct benefits to Mount Isa becoming a green hydrogen hub are also outlined in this subsection.

Overview of hydrogen supply chain

Green hydrogen refers to hydrogen generated from electrolysis using renewable electricity. Electrolysers split water into hydrogen and oxygen. This hydrogen electrolysis conversion method is not new, and there are four mature electrolyser technologies: alkaline (ALK), proton exchange membrane (PEM), anion exchange membrane (AEM), and solid oxide (SOEC).

Alkaline electrolysers provide low-cost hydrogen when operated under steady load. Proton exchange membrane can flexibly react to variable renewable energy, and it is faster developing technology. Solid-oxide electrolyser and AEM provide attractive advantages for niche applications, however PEM and Alkaline are most attractive for commercial scale applications. Solid-oxide and anion exchange membrane electrolysers provide attractive advantages for niche applications, with PEM and alkaline the most attractive for commercial-scale applications.

Hydrogen production and supply chain involves several steps, which are shown in Figure 5-6 below. The key components include:

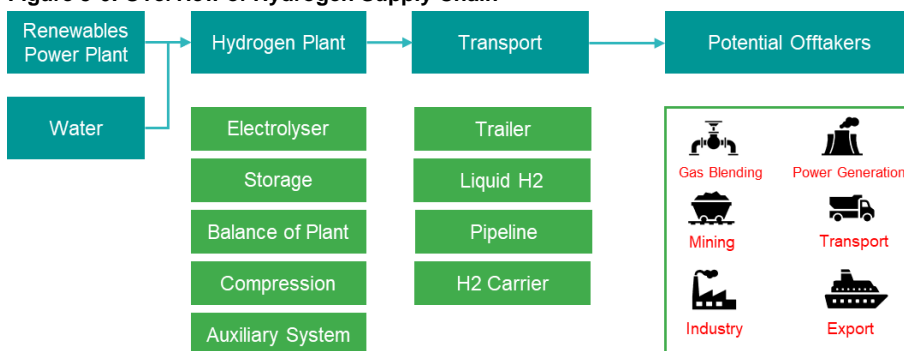
- Inputs: availability of low-cost renewable electricity and a sustainable source of water.
- Hydrogen production plant: production facility with selected electrolyser technology, as well as the balance of the plant required to run the electrolyser system.
- Transportation: infrastructure required to transport hydrogen from the production facility to the designated end-use or storage facility, which could via pipeline, truck, and carrier, and in the form of gas or liquid.
- Offtaker: end-use application.

The co-location of hydrogen producers with end-users is generally the preferred approach to support a cost-effective hydrogen industry, as it reduces infrastructure and transportation costs as well as limit or avoid other technical barriers. Hydrogen production plants can be scaled depending on the availability of inputs and land, and the scale of demand from end-users.

²⁸ HyResource. (2024). Industry - active projects portal. [online] Available at: <https://research.csiro.au/hyresource/projects/facilities/>.

²⁹ Geoscience Australia, "Geoscience Portal, Hydrogen Projects"

Figure 5-6: Overview of Hydrogen Supply Chain



Source: Mott MacDonald

5.1.3.2 End users

Hydrogen can be delivered to end-users, or offtakers, depending on the location via pipeline, trailer, or liquid hydrogen. For large volumes of hydrogen, pipeline infrastructure is typically the most cost-effective transportation mode. Depending on offtakers requirements, additional infrastructure is often required for the final end-use, including:

- Refuelling station: infrastructure capable to refill vehicles with hydrogen fuel³⁰.
- Gas network infrastructure: blending green hydrogen with conventional natural gas may require upgrades or modifications to existing gas network infrastructure and end-use applications.
- Fuel cell installation: fuel cells generates electricity through a chemical reaction between hydrogen and oxygen³¹.
- Industrial facility infrastructure: hydrogen can be used in industrial processes, such as a feedstock for fertiliser and other chemical production, which would likely require additional or modified infrastructure, including on-site storage.

Mount Isa has an isolated power network with issues concerning reliable supply of energy (as discussed in section 3.3.22.4). Reliability can be strengthened by hydrogen energy storage to achieve localised power supply as well as backup power solution in the event of a critical failure in the power network.

5.1.3.3 Hydrogen potential in Mount Isa

Existing infrastructure and resources

Figure 5-7 below outlines some components of a hydrogen supply chain in the Mount Isa region that could be suitable to support the development of a hydrogen hub. The energy and water requirements for hydrogen production are driven by the capacity of the production facility, availability and timeliness of input resources, and the type of electrolyser technology. In general,

³⁰ <https://www.csiro.au/en/about/challenges-missions/Hydrogen/Hydrogen-Refuelling-Station>

³¹ Singla, M.K., Nijhawan, P., and Oberoi, A.S. (2021). Hydrogen fuel and fuel cell technology for 61a cleaner future: 61a review. Environmental Science and Pollution Research, 28. doi:<https://doi.org/10.1007/s11356-020-12231-8>.

the water and electricity demand for hydrogen production is estimated at 15-18 L³² and 50-57 kWh per kg of hydrogen respectively.³³

High-quality solar and wind resources, with respective capacity factors greater than 25% and 40%, are available south of Mount Isa. Mount Isa is suitably positioned to access low-cost dedicated renewable generation, as well as excess (curtailed) generation should the uptake of renewable energy development increase significantly over time.

The Mount Isa region also appears well-positioned with respect to water resources and availability. The region draws water from two reservoirs, Lake Moondarra and Lake Julius, with a combined estimated available capacity of over 190,000 ML. These reservoirs supply residential and industrial customers with an average water consumption of 30,000 ML per year. Despite drought risks, the Mount Isa Council anticipates a high-level of water security out to 2041³⁴.

Based on high-level assumptions for demand from the end-users outlined below, we estimate that there is the potential for total hydrogen demand of 229,000 tonnes per annum (TPA):

- Incitec Pivot's ammonia plant: 48,000 TPA
- Gas pipeline blending (10%): 8,000 TPA
- 320 MW Mount Isa power station: 162,000 TPA
- Average power demand for one mining site to replace onsite natural gas-powered generation: 11,000 TPA.

A 1.6 GW hydrogen plant would meet this estimated hydrogen demand, consuming approximately 5,000 ML of water per year. The land requirement for a 1 GW electrolyser plant is 10 ha,³⁵ excluding land for additional energy infrastructure.

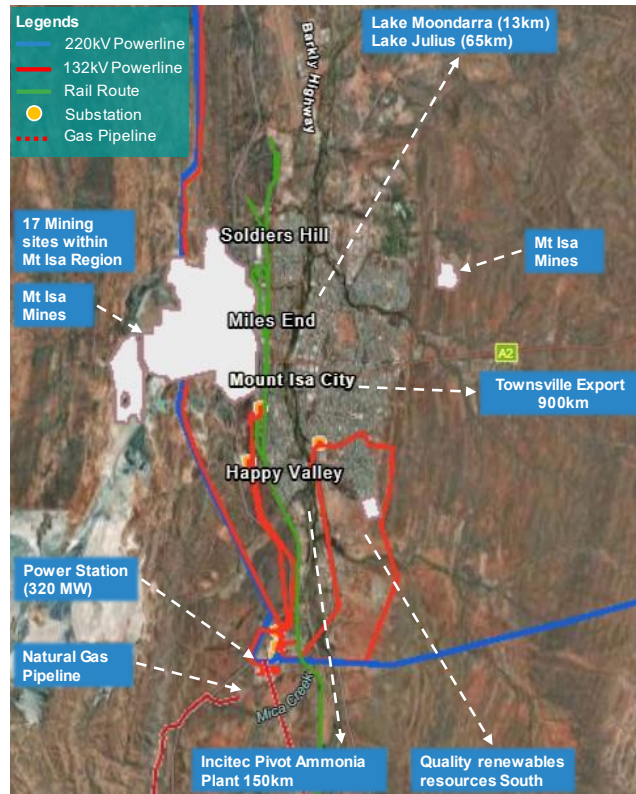
³² Slanger, D. (2023). Hydrogen Reality Check: Distilling Green Hydrogen's Water Consumption. [online] RMI. Available at: <https://rmi.org/hydrogen-reality-check-distilling-green-hydrogens-water-consumption/>.

³³ IRENA - Characterisation of the four types of water electrolyzers

³⁴ Mount Isa regional water supply security assessment. (2019). Department of Natural Resources, Mines and Energy.

³⁵ Public-report-gigawatt-advanced-green-electrolyser-design.pdf (ispt.eu)

Figure 5-7: Satellite image of infrastructure availability around Mount Isa



Source: Mott MacDonald analysis of AusH2 – Australia's Hydrogen Opportunities Tool map

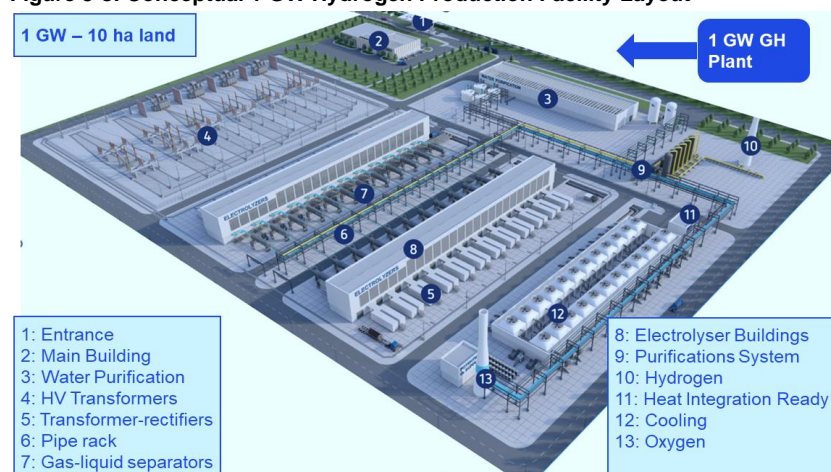
Infrastructure requirements

Large scale hydrogen supply will require new and modified infrastructure, sector coupling with renewables and the electricity grid, and the development of end-use demand in a range of industries and applications. Production of green hydrogen could be led by energy developers or, ideally, in partnership with Mount Isa City Council, to ensure that the development of required renewable energy generation and infrastructure is effectively planned, coordinated, and aligned. Hydrogen production in the Mount Isa region will likely require:

- Additional renewable generation
- Electricity or water infrastructure upgrades
- Commercial development that may be suited to multi-modal energy hubs

A simplified overview of the hydrogen supply chain that could apply to a hydrogen hub is shown in Figure 5-8 below Figure 5-6. Localised production includes hydrogen electrolyser plants, hydrogen storage, compression, balance of plant, and key enabling infrastructure. In order to develop a robust hydrogen supply chain roadmap, each step of the supply chain needs a detailed assessment to evaluate the challenges and high-level techno-economic details.

Figure 5-8: Conceptual 1 GW Hydrogen Production Facility Layout



Source: Hydrohub, ISPT (2022)

5.1.3.4 Hydrogen hub in Mount Isa

Green hydrogen hub benefits

The benefits of green hydrogen hubs extend beyond the key driver of tackling climate change by decarbonising existing industries. Some of the benefits that may be realised by a hydrogen hub development in Mount Isa are included in Table 5-2.

Table 5-2: Socio-economic benefit of a hydrogen hub

Key drivers	General socio-economic benefits	Impact on Mount Isa
Employment and upskilling opportunities	<ul style="list-style-type: none"> Establishing a hydrogen hub can lead to the creation of new jobs in various sectors, including construction, operation, and maintenance of hydrogen production facilities³⁶. The influx of new technologies and industries could lead to improved educational and training opportunities for residents, enhancing skill sets and employability³⁷. 	<ul style="list-style-type: none"> Construction jobs Ongoing and maintenance jobs Community development through training
Economic growth	<ul style="list-style-type: none"> They can stimulate local economies by attracting investments and fostering new business opportunities related to hydrogen production and utilisation³⁸. 	<ul style="list-style-type: none"> Investment attraction Economic diversification (away from mining)
Environmental benefits	<ul style="list-style-type: none"> Hydrogen hubs contribute to reducing greenhouse gas emissions, which can improve public health 	<ul style="list-style-type: none"> Improved environment, air quality and overall liveability

³⁶ <https://www.hydrogen.sa.gov.au/projects>

³⁷ <https://www.abc.net.au/news/2022-11-15/north-queensland-energy-super-hub-renewable-solar-wind-power/101655280>

³⁸ <https://www.hydrogen.sa.gov.au/projects>

Key drivers	General socio-economic benefits	Impact on Mount Isa
	and reduce healthcare costs associated with pollution ³⁹ .	
Energy security	<ul style="list-style-type: none"> By producing hydrogen locally, regions can reduce their dependence on imported fuels, enhancing energy security⁴⁰. 	<ul style="list-style-type: none"> Reduced reliance on gas and diesel Backup energy generation source should network be isolated
Innovation and technology development	<ul style="list-style-type: none"> Hubs can serve as centres for innovation, driving the development of new technologies and applications hydrogen⁴¹. 	<ul style="list-style-type: none"> Technology and innovation centre

Implementation pathways

A potential implementation pathway for a hydrogen hub is presented in Figure 5-9. The pathway outlines the key steps involved to deliver a hydrogen hub and provides an indication of the underlying actions that are required for a clear and structured approach for hub development.

The Australian Renewable Energy Agency (ARENA) has provided funding for several projects that demonstrate the potential for hydrogen to support the decarbonisation of multiple industrial end users. Accessing government funding programs, such as ARENA’s investment strategy for commercialising renewable hydrogen,⁴² could facilitate that development of a Mount Isa hydrogen hub.

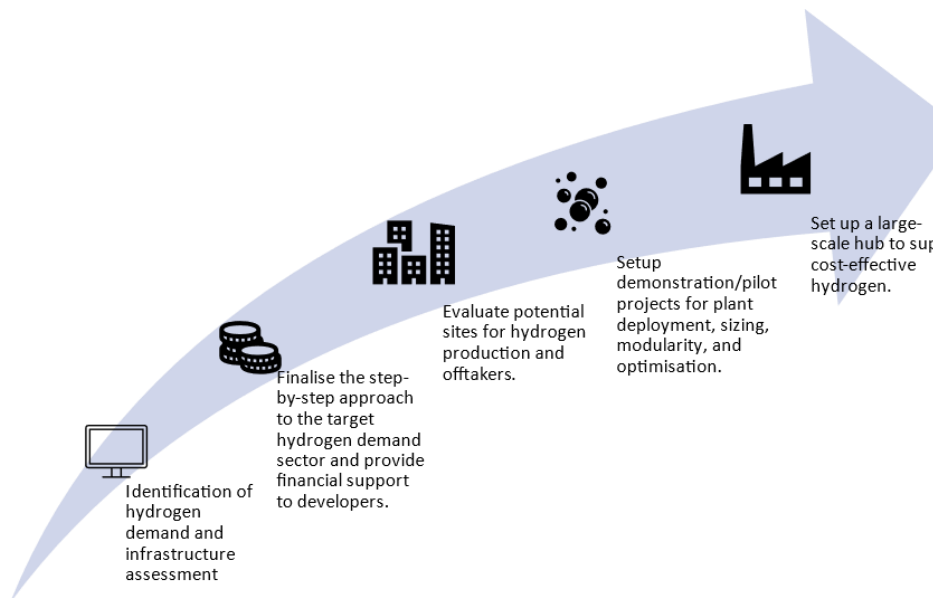
³⁹ <https://hydrogencouncil.com/en/newsroom/>

⁴⁰ <https://seshydrogen.com/en/hydrogen-hub-what-is-it-description-of-the-concept-areas-of-application/>

⁴¹ <https://seshydrogen.com/en/hydrogen-hub-what-is-it-description-of-the-concept-areas-of-application/>

⁴² ARENA Investment Plan 2023. (2023). Australian Government - Australian Renewable Energy Agency.

Figure 5-9: Hydrogen hub implementation pathways



Source: Mott MacDonald

5.2 Policy and regulation advocacy

There are several policy and regulatory initiatives that could facilitate an improved development environment for renewable energy projects, as well as the loads they aim to service identified in this report. This subsection provides a summarised overview of the different policy and regulatory reforms that could support the development of low-cost renewable energy supply and associated demand in the Mount Isa region.

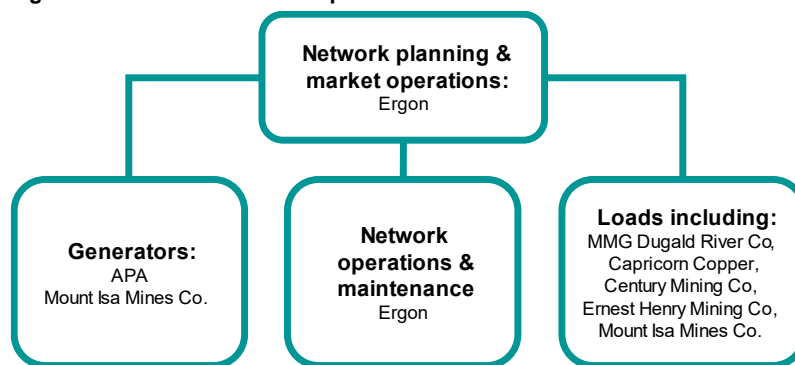
5.2.1 NWPS operational structure

Context and opportunity for reform

Currently, the NWPS is a committee-based system with APA appointees holding the Chairperson and Generation Coordinator roles. This strong presence has allowed APA to dominate the network connection process, creating barriers for new competitors who seek entry, (see Section 3.3.2 for further detail). To support diversity of energy generation and increased competitiveness across suppliers, reforming the NWPS Dispatch Control and operational structure should be explored.

A potential reform could be for Ergon to take on the role of independent network operator for the NWPS, rather than a committee-based system, and would divest direct ownership over generation or load assets within the region, effectively dismantling the existing monopolistic landscape. In addition to this reform, inspiration can be drawn from the North West Interconnected System (NWIS) or Alice Springs network, in which government-owned transmission asset owners and operators (Horizon (WA) and Power and Water Corporation (PWC)), operate islanded grids. Should this reform gain traction, the change would need to be formalised through engagement with the Australian Competition and Consumer Commission (ACCC). See Figure 5-10 below for the potential new operational structure discussed above.

Figure 5-10: Reformed NWPS operational structure



Source: Mott MacDonald

Benefits of Reform

Reforming the NWPS’ operational structure would improve overall transparency and independence within the region, fostering an increasingly competitive landscape for energy generation. As Ergon already operates and manages NEM-compliant networks, the pathway for integration of the NWPS into the NEM would likely be simpler for Ergon rather than the NWPS committee to manage.

CopperString Context

If CopperString does not go ahead, NWPS reform is potentially more critical to ensure the aforementioned renewable energy benefits are realised in the Mount Isa region. However, if CopperString does proceed as planned, Ergon would hand management over to AEMO. It is likely that having Ergon as the network operator would ensure a smoother transition when connecting to the NEM in comparison to the current setup.

Delivery strategy

In order to introduce reform, the following steps should be considered:

- Review the current operational structure, roles, and responsibilities to identify and assess which functions of the committee could be transferred to Ergon.
- Prepare a submission to the NWPS Committee and ACCC outlining the proposed structural changes and its benefits to the NWPS participants.
- Develop a roadmap to integrate the NWPS into the NEM in partnership with AEMO, Powerlink, Ergon and NWPS participants.

5.2.2 Energy investment landscape

Transitioning and diversifying Mount Isa’s economy away from the current reliance on mining is essential to the longevity of the region and will likely need to be facilitated through the implementation of policies that foster growth or reform in different areas. Figure 5-11 below highlights several policy options that could deliver the desired growth outcomes for Mount Isa. As part of the continuing the initial engagement with the Department of Energy and Public Works on shortlisted energy options identified in this report, the Council could advocate for these policy options more broadly.

To fully capitalise on Mount Isa’s abundant mineral resources and its significant potential for solar and wind energy production, it is necessary to establish a robust framework for energy

investment and devise a comprehensive strategy for the development of renewables. This strategic approach will ensure that Mount Isa reaps the maximum benefits of its natural assets.

Balancing resources and renewables

A supply-demand balance of renewables and resources could be achieved through policies that facilitate sustainable investment in mining, to increase energy demand aligned with rising renewable energy supply. Stimulating this growth would generate a large number of direct industry jobs in construction and operation of new energy and resources developments, with opportunities for 'like-for-like' job replacement in the resources sector, and upskilled positions in renewables.




Reduced investment uncertainty

The introduction of policies such as reshaping the Community Service Obligation (CSO), offering green loans or other financial/planning incentives, will encourage investment in the region through lower and certain electricity prices, with investment recovered through the resources boom. This reduction in investment uncertainty in Mount Isa would stimulate growth and thus create more job opportunities through an increased demand in diversified infrastructure and services. Such services include school and healthcare which would be needed to support a growing population.

Existing energy as an enabler

The introduction of a policy that defines access arrangements, separates system planning functions from APA and subsidises connection and new loads, would ultimately improve the strength of the grid. This improved strength would result from a more competitive and independent system planning body, leading to greater investment in mining and renewables.

Figure 5-11: Recommended reforms, frameworks, and incentives

Context	Recommendation	Policy Options	Outcomes
 <p>Balance Resources & Renewables</p>	<ul style="list-style-type: none"> More renewables supply to the region should stimulate lower cost electricity if targeted at a growing energy demand from the resource sector. 	<ul style="list-style-type: none"> Create an economic growth policy which leverages the benefits of CU string supported by economic stimulus for mining through renewable targets. 	<ul style="list-style-type: none"> Create a supply - demand balance by matching an increase in renewables supply with an increased demand through mining investment.
 <p>Reduce Investment Uncertainty</p>	<ul style="list-style-type: none"> Provide electricity price & connection certainty by creating a LT infrastructure cost recovery approach (e.g. park & loan, smearing to SEQ or new region). 	<ul style="list-style-type: none"> Reshape the CSO, offer green loans or other financial / planning incentives to investment recovered through the NWMP resources boom. 	<ul style="list-style-type: none"> Lower and certain electricity prices will drive economic development if supported by a LT resource development policy and decarbonisation target.
 <p>Existing energy as an Enabler</p>	<ul style="list-style-type: none"> Centralise system strength through existing gas generation & BESS at Mt Isa will enable more VREs which enables a lower LCOE locally. 	<ul style="list-style-type: none"> Define access arrangements, separate system planning function from APA, and possibly subsidies connections, new load & system strength capacity. 	<ul style="list-style-type: none"> Improved grid strength, facilitated by a more competitive & independent system planning body will provide greater renewables & mining investment.

Source: Mott MacDonald

Ultimately, each of these policy options will facilitate sustained economic growth in Mount Isa which will lead to an increased demand for direct, indirect, and enabled job opportunities to support this growth. This would assist in supporting the current Glencore Copper Mine workforce in either transferring to other resources employment or upskilling to join the renewable energy generation boom. Additionally, these initiatives present an opportunity to actively include and support First Nations communities.

5.3 Social outcomes

5.3.1 Summary

When investing in energy projects to support diversification of Mount Isa's economy and maintaining its population base, a number of socio-economic factors need to be considered by Council and the state government (see Appendix A for further detail). At this early stage detailed data and modelling is not yet available but is recommended to be developed for subsequent phases of planning. Notwithstanding this, there are several factors that should be considered when reviewing potential energy projects for the ability to contribute to the goal of Mount Isa's ongoing sustainability including:

- Considering the type of job creation from economic investment and the broader value it delivers (e.g. direct, indirect and enabled)
- A detailed understanding on the current workforce and its socio-economic footprint
- Consideration of levels of job replacement vs job redeployment
- Delivery of socio-economic outcomes (e.g. equity, inclusion and intergenerational opportunities).

In reviewing and evaluating energy projects it is important to be mindful of other enabling factors to a successful transition including:

- Levels of stakeholder involvement, including in planning, decision-making and implementation
- Achieving alignment and participation across all levels of Government
- Planning across short, medium, and long-term
- Proactively partnering to inject capability and capacity
- Integrating economic and community development programs
- Taking a dual approach to leveraging current capability as well as diversifying into new industries.

5.3.2 Risks

There are some specific social risks that would need to be addressed in conjunction with any future energy developments. The key risks and relevant options for mitigation are described below:

- **Housing and accommodation** – The management would be to develop a housing and accommodation strategy and amend the planning scheme to reflect the strategy. There may be an 18-month lag for this process, however this time may be shortened through planning options in the short term (e.g. Council and/or community housing led development, Ministerial Infrastructure designation etc). It may still take up to 12 months to get this processed.
- **Engagement with Native Title Holders** (especially on lands that possess exclusive native title determination) – There is high risk associated with a failure to engage Native Title Holders and ensuring that they are on board with the project. If there is a failure to engage, further development of the project may be restricted, with Native Title Holders refusing to enter an Indigenous Land Use Agreement (ILUA).
- **Training and Skill Development Opportunities Provided Locally** – This would allow potentially retrenched workers to access opportunities enabling a transition from mining jobs to new industry. This should be part of the mine closure strategy that Glencore are developing; however, it does pose a significant risk if it is not successfully addressed.

- **Adverse Impacts on Workers Affected by the Transition** - Risks including health and wellbeing, financial impacts (capacity to pay mortgage) and skill development will need to be mitigated. A just transition strategy that supports the workforce as it transitions out of mining to the other industries should be developed. There is information on employment transition programs available on the Queensland Government's Transition Programs webpage⁴³, however there is currently no content relating to the energy transition yet. An example of one of these programs for Stradbroke Island can be found on this Queensland Government site⁴⁴.
- **Community Involvement/Engagement from Stage 1 to Stage 2** – It will be essential to have community involvement/engagement on the final strategy outcomes (stage 1) to guide the implementation of stage 2. A mitigation strategy for this would be to develop a community and stakeholder engagement plan to support the industry transition.
- **Local Industry Involvement** – There will need to be local industry capability to access procurement opportunities associated with the transition. A mitigation for this could involve applying the Qld Resources and Energy Sector Code of Practice for Local Content⁴⁵ by developing a local content strategy.

⁴³ <https://desbt.qld.gov.au/employment/transition-programs>

⁴⁴ <https://desbt.qld.gov.au/employment/transition-programs/north-stradbroke-assistance>

⁴⁵ <https://www.qrc.org.au/policies/local-content/>

6 Next steps

The options assessments for the energy pillar successfully provided nine shortlisted options for Mount Isa City Council to consider for the next phase. It was highlighted that the Mount Isa region has the potential to convert into a REZ given its abundance of natural resources and land. Additionally, its strategic location can transform the economy into a logistics hub. CopperString also has the potential to be one of the most significant drivers for economic growth in Mount Isa and will be critical for a sustainable future involving renewable energy developments in the region.

With the research and preliminary assessments completed, the initial wins can be actioned immediately to assist with retaining the population from the anticipated copper mine closure. The MITF Stage 2 will guide the broader market on what is required to be constructed within Mount Isa. This will instigate further interest within the region to proceed with construction and development in Mount Isa.

The medium to longer term opportunities, such as hydrogen development, will need to be assessed for their practicality and viability. This includes detailed feasibility studies supported by technical, financial, regulatory, and environmental assessments and analyses. These studies will lead to a detailed design for execution and clear implementation pathway.

Mount Isa may encounter key risks from the shortlisted options, which are outlined in Table 4-8. A brief mitigation plan outlines approaches to avoid, minimise, and mitigate these risks. The high-level risk plan requires further assessment for individual shortlisted options as they progress and develop.

In summary, the actionable next steps for Council are detailed in Table 6-1.

Table 6-1: Actionable next steps

Actionable step	Details
Advocate for Stage 2 funding for the Mount Isa Transition Fund projects that have been identified as high priority.	As discussed in Section 5.1, the three high priority projects are; <ul style="list-style-type: none"> • (S2) Harmony Gold solar + diesel + battery storage • (S4) Someva wind farm • (S6) Green Gravity energy storage Each of these projects would benefit from funding and would ultimately contribute to the creation of a REZ in Mount Isa if they are able to proceed.
Initiate the development approval process with Powerlink and the State Government for the Mount Isa phase of CopperString within this calendar year to prevent any potential delays	To provide certainty with connecting CopperString into the Mount Isa region, Powerlink and the State Government need to approve this connection. This will provide confidence for existing and prospective customers to operate in Mount Isa. Taking this step will greatly benefit Incitec Pivot Limited and Harmony Gold in their plans to connect to the NEM (project's D2 and D3).
Craft a compelling business case for the Mount Isa Renewable Energy Zone to present to Powerlink and the State Government, ensuring alignment with the Queensland Renewable Energy Zone (QREZ) strategy.	Advocating for Mount Isa as a REZ would greatly incentivise the establishment of a hydrogen hub and create a favourable case for CopperString to go ahead in order to support new renewable energy projects. This action will positively affect

	<p>the majority of the shortlisted projects as discussed below:</p> <ul style="list-style-type: none"> Project’s S1/3 to S6 would greatly benefit as they will all either supply or store renewable energy. D1 would benefit if the establishment of a REZ leads to investment in hydrogen. An increase in renewable generation in the region would also provide the needed supply for EV charging stations. <p>As the establishment of a REZ would necessitate CopperString, D2 and D3 would benefit by the ability to connect to the NEM.</p>
<p>Formulate a hydrogen infrastructure roadmap that aligns with the blueprint provided in this report, outlining key steps and milestones.</p>	<p>Creating a hydrogen roadmap may assist in paving the way for Mount Isa to utilise its favourable natural resources which aid in hydrogen production. Through this, a hydrogen hub could be established which would generate jobs and investment in the region. Project D1 would greatly benefit from this proposed action due to the proposed use of hydrogen charging stations as a part of the new logistics hub.</p>
<p>Develop a demand strategy to reinforce the requirement for renewable energy and CopperString which in turn will stimulate the economy.</p>	<p>Through assessments of all pillars for the diversification and transformation of Mount Isa economy, a strategy to create energy consumption activities needs to be developed. A transport/logistics hub (D1), expansion of existing large consumers such as North West Phosphate and Incitec Pivot (D2 and D3), and the attraction of other potential customers looking to connect into Mount Isa (from other pillars) will enable the region to further diversify, transform and grow.</p>
<p>Propose a restructuring of the NWPS Committee’s operational framework, recommending Ergon as the interim market operator until CopperString’s integration, followed by AEMO assuming the market operator role.</p>	<p>As discussed in Section 5.2.1, a restructure of the current operational framework of the NWPS Committee may ensure a smooth transition when connecting to the NEM via CopperString. A restructure would also ensure that CopperString goes ahead as there would be decreased incentives to the contrary.</p> <p>Again, taking any measure to ensure CopperString goes ahead would benefit the majority of the projects, however D2 and D3 would benefit directly through an ability to connect to the NEM.</p>
<p>Promote for the establishment of a conducive energy investment environment in Mount Isa by proposing new policy initiatives that encourage energy development in the region.</p>	<p>Policy advocacy options are explored in greater detail in Section 5.2.2. Overall, advocating for increased development in Mount Isa would encourage all new renewable energy supply and demand projects within the region, leading to new employment opportunities.</p>
<p>Develop a roadmap for energy transition social outcomes that focuses on maximising employment opportunities and benefits for the Mount Isa community.</p>	<p>A focus on social outcomes is essential to the successful transition of Mount Isa’s economy. Having a clear plan in place will assist in identifying new positions required for new energy projects. This knowledge will benefit all projects as relevant companies can use this as a tool when planning projects in the region.</p>

6.1 Funding Options

A key next step for the MICC would be to seek further funding to support the next stages of Mount Isa’s transition. Various funding and financing options are offered through ARENA, CEFC, the Australian Government, and the Queensland Government. Table 6-2 provides details of relevant options, the target audience for the application, and the action required by MICC.

Table 6-2: Funding Options

Funding / support body	Fund / Support	Relevant Applicant	Action for MICC
ARENA	Driving the Nation Program <ul style="list-style-type: none"> A fund providing \$500 million to invest in cheaper and cleaner transport. This program could assist Mount Isa as a transport hub. Relevant link: https://arena.gov.au/funding/driving-the-nation-program/ 	An entity willing to undertake the development project, (e.g. MICC).	Investigate the potential of Mount Isa as a transport hub.
	Powering the Regions Industrial Transformation Stream <ul style="list-style-type: none"> A fund providing \$400 million intended to support the reduction of industrial emissions at existing National Greenhouse Energy Reporting (NGER) industrial facilities in Regional Australia. Relevant link: https://arena.gov.au/funding/powering-the-regions-industrial-transformation-stream/ 	Existing industry in Mount Isa, (e.g. mines, processing facilities).	Communicate the existence of the program to industry in Mount Isa.
	National Industrial Transformation Program <ul style="list-style-type: none"> A fund providing \$40 million to support the reduction of emissions related to Industrial Activity across Australia. Relevant link: https://arena.gov.au/funding/national-industrial-transformation-program/ 	Existing industry in Mount Isa, (e.g. mines, processing facilities).	Communicate the existence of the program to industry in Mount Isa.
	Regional Microgrids Program <ul style="list-style-type: none"> the Program seeks to support the development and deployment of renewable energy microgrids across regional Australia. There are two different streams: <ul style="list-style-type: none"> Stream A: Regional Australia Microgrids Pilots Stream B: First Nations Community Microgrids Relevant link: https://arena.gov.au/funding/rmp/ 	Ergon Energy (As a part of the proposed microgrid development in Doomadgee, Burketown & Camooweal).	Communicate the existence of the program as an option for Ergon.
CEFC	Innovation Fund <ul style="list-style-type: none"> A venture capital investment program for investment in innovative businesses helping to accelerate the transition to net zero emissions. Relevant link: https://www.cefc.com.au/where-we-invest/special-investment-programs/clean-energy-innovation-fund/ 	Innovative projects in the region (e.g. Green Gravity/MIM).	Communicate the existence of the program to entities interested in developing in Mount Isa.
	Powering Australia Technology Fund <ul style="list-style-type: none"> \$500 million worth of investment in businesses and entities that are developing, commercialising, and supporting the deployment of technologies with the potential to accelerate Australia’s transition to net zero emissions by 2050. Relevant link: https://www.cefc.com.au/where-we-invest/special-investment-programs/powering-australia-technology-fund/ 	A business requiring investment to deploy new technology. (e.g. Green Gravity/MIM).	Communicate the existence of the program to entities interested in developing in Mount Isa.
	Advancing Hydrogen Fund <ul style="list-style-type: none"> \$300 million to support the growth of a clean, innovative, safe, and competitive Australian hydrogen industry. Alongside the \$2 billion Hydrogen Head start Program, this fund will seek to provide complementary equity and debt financing for relevant projects. 	An entity seeking to invest in hydrogen production in Mount Isa.	Communicate the existence of the program to entities interested in the development of

Funding / support body	Fund / Support	Relevant Applicant	Action for MICC
	<ul style="list-style-type: none"> Relevant Link: https://www.cefc.com.au/where-we-invest/special-investment-programs/advancing-hydrogen-fund/ 		hydrogen in Mount Isa.
Australian Government	<p>Emissions Reduction Fund</p> <ul style="list-style-type: none"> A fund which provides businesses with the opportunity to earn Australian carbon credit units for every tonne of carbon dioxide equivalent that a business store, or avoids emitting through adopting new practices and technologies. Relevant link: https://business.gov.au/grants-and-programs/emissions-reduction-fund 	A business that is wanting to reduce carbon emissions	Communicate the existence of the program to industry in Mount Isa.
	<p>Large-scale Renewable Energy Target</p> <ul style="list-style-type: none"> Encourages investment in the development of renewable energy power stations, like wind and solar farms, by: <ul style="list-style-type: none"> providing a financial incentive for electricity generated from renewable sources, creating a market for creating and selling large-scale generation certificates (LGC). Relevant link: https://cer.gov.au/schemes/large-scale-renewable-energy-target 	Business who are interested in the development of renewable generation in Mount Isa (e.g. Neoen, APA, Someva, Green Gravity etc.)	Communicate the existence of the program to the businesses who are interested in developing renewable generation in Mount Isa.
	<p>Remote Jobs and Economic Development Program</p> <ul style="list-style-type: none"> The program will provide people in remote communities with meaningful jobs with fair pay and conditions which will be supported by employment services. The program was created in partnership with First Nations people, initially funding 3,000 jobs over three years. Relevant link: https://www.niaa.gov.au/our-work/employment-and-economic-development/remote-jobs-and-economic-development-program 	People in remote communities who require employment support	Communicate the existence of the program to relevant communities and industry in Mount Isa.
	<p>DCCEEW Capacity Investment Scheme</p> <ul style="list-style-type: none"> This scheme has the aim of providing a national framework to encourage new investment in renewable capacity, such as wind and solar, as well as clean dispatchable capacity, such as battery storage. The Australian Government are seeking competitive tender bids for renewable capacity and clean dispatchable capacity projects. Relevant link: https://www.dcceew.gov.au/energy/renewable/capacity-investment-scheme 	Businesses who are interested in the development of renewable generation in Mount Isa (e.g. Neoen, APA, Someva, Green Gravity etc.)	Communicate the existence of the program to the businesses who are interested in developing renewable generation in Mount Isa.
	<p>Northern Australia Infrastructure Fund</p> <ul style="list-style-type: none"> A Commonwealth Government financier, providing concessional loans for the development of infrastructure projects in northern Australia and the Australian Indian Ocean Territories. Relevant Link: https://www.naif.gov.au/our-investments/how-and-where-we-invest/ 	Businesses who are interested pursuing development in Mount Isa (e.g. Neoen, APA, Someva, Green Gravity etc.)	Communicate the existence of the program to the businesses who are interested in developing in Mount Isa.
Queensland Government	<p>Queensland Energy and Jobs Plan</p> <ul style="list-style-type: none"> The plan outlines how Queensland's energy system will transform to deliver clean, reliable and affordable energy to provide power for generations. The plan sets out our state's bold vision to achieve 70 percent renewable energy by 2032 and 80 per cent by 2035. https://www.energyandclimate.qld.gov.au/energy/energy-jobs-plan/about-plan 	A good resource for any entity looking to develop in the realm of renewable energy.	Communicate this resource to businesses who are interested in the development of renewable energy in Mount Isa.
	<p>Regional Economic Futures Fund</p>	(e.g. copper smelter, Incitec	As REFF funding

Funding / support body	Fund / Support	Relevant Applicant	Action for MICC
	<ul style="list-style-type: none"> A \$200 million program to support communities in seizing industry development opportunities presented by global decarbonisation. Funding will be allocated to specific projects that have been identified through regional consultation. Relevant link: https://www.statedevelopment.qld.gov.au/industry/queensland-new-industry-opportunities/regional-economic-futures-fund 	Pivot ammonia production).	announcements are due to be made in the second half of 2024, MICC to monitor for future rounds of funding.
	<p>Industry Growth Program</p> <ul style="list-style-type: none"> An advisory Service program for startups and small and medium enterprises (SMEs) undertaking innovative commercialisation and/or growth projects to help build Australia’s manufacturing capability for the future. Relevant Link: https://business.gov.au/grants-and-programs/industry-growth-program 	SMEs or startups interested in development within Mount Isa.	Communicate the existence of the program to the businesses who are interested in developing in Mount Isa.

Appendices

A.	Socio-economic considerations and case studies	66
B.	Long list of options	72
C.	Assessment of shortlisted options	73
D.	Stakeholder consultation notes	74

A. Socio-economic considerations and case studies

A.1 Key considerations when planning for Mount Isa's future socio-economic prosperity

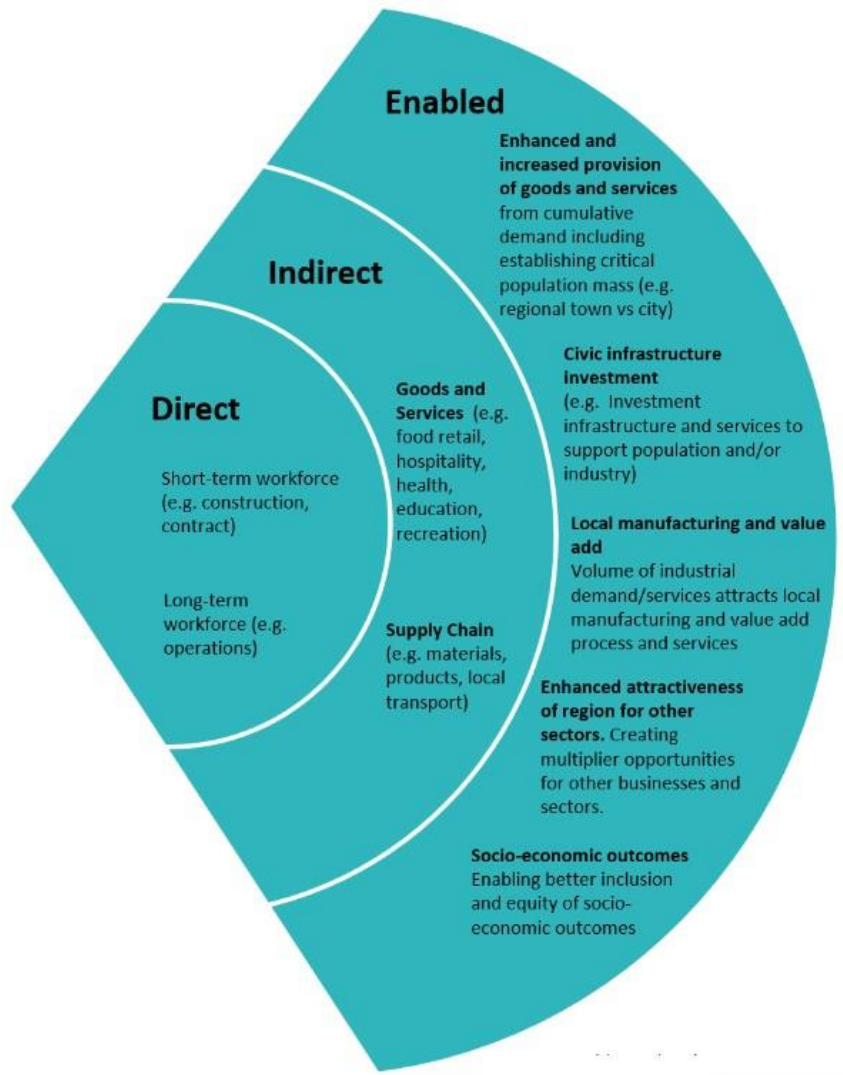
Creation and transition of employment opportunities are complex, with the quality of the job and the mechanism for facilitating the transition equally important success factors. To better assess the potential Energy projects and the value they can provide to Mount Isa's transition, this section explores some of these elements in two parts. Firstly, it will consider factors that inform the 'quality' of the job and how these might contribute to the achievement of Mount Isa City Council's goal. Secondly, by looking at two case studies it will look at supporting mechanisms and capacity required to successfully facilitate a transition.

A.2 Quality of job creation

Types of economic and employment opportunities

When considering the relationship between employment ('jobs') and population and liveability of a regional town there are many interconnected factors and relationships to consider, (see Figure 6-1). These different elements work as a complex system where each town and industry function differently. Some elements of this system are easier to measure and predict (e.g. direct employment opportunities on a Project). Others are more difficult to measure and/or contingent on multiple factors (e.g. enabled employment). Some projects, businesses or industries may offer larger, direct employment opportunities but less enabled employment (e.g. some agricultural sectors have higher levels of employment from primary production with value-add processes undertaken in other localities/offshore), while others may offer smaller amounts of direct employment but larger enabled or multiplier effects (e.g. the renewable energy sector employs relatively small numbers of people during operations, however access to renewable energy can catalyse and attract other industries such as mining, manufacturing and transport).

Figure 6-1: Examples of the types of direct, indirect and enabled job creation opportunities as result of a particular economic activity (e.g. project, business and/or industry)



Source: Mott MacDonald

While employment can have an impact on a community, the population size and liveability can also impact the type of workforce that can be attracted and retained. For example, more liveable towns with diverse employment opportunities and good quality service and infrastructure are more likely to attract long-term residential families. This, in turn, increases the population base and demand for diversified infrastructure and services (e.g. schools, health care, recreation).

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FIFO and DIDO workforces often have a different economic flow-on effect on communities and economies with single workers spending a limited time on-site with families and personal activities located in a different community.

Delivery of inclusive and equitable intergenerational outcomes

Economic and employment opportunities that seek to deliver inclusive and equitable outcomes also have a different socio-economic impact than those that do not. This may include improvement in skills through training and capacity building, providing improved economic conditions for disadvantaged households and communities; or enabling First Nations people to live and work on Country. This type of opportunity often has broader socio-cultural, economic and health and wellbeing flow on effects.

Consideration should also be given to intergenerational opportunities. For example, short-term opportunities may provide temporary respite but ultimately only delay the population decline. Projects, businesses, and industries that will directly or indirectly create a sustainable economic and employment base will systemically address the issue in the long-term and potentially across multiple generations.

Developing a detailed socio-economic baseline was not included in this scope of work, however, it is recommended that this work is undertaken to support detailed and robust future planning.

Current Glencore workforce

Glencore's copper mine operations currently employ 1,200 people directly and procure significant amounts in local goods and services. Assessing the viability of different options for diversifying Mount Isa's economy and retaining its population base (including energy options), requires a detailed breakdown of the copper mine's existing workforce. Age, family composition, years of service and other factors all enable an understanding of what this workforce currently contributes to Mount Isa's broader economy, and therefore the potential impact of this workforce either leaving or being redeployed locally. For example, if the average age of workers at the copper mine is relatively high or there is a large percentage nearing retirement, this presents a different type of scenario than if the workforce is largely middle-aged with a high number of residential families. Equally some occupations may be more directly transferrable than others.

Access to this type of information was not available for this analysis, however, it is recommended data collection and analysis be included in future work.

Job redeployment vs job replacement

There are different approaches to how Council can approach maintaining its population following closure of the copper mine. One approach involves looking for a like-for-like redeployment of jobs which leads to the retention of the existing population. For example, Joe works at the Mount Isa copper mine and is going to lose his job in 2025. If Joe is provided with support to redeploy to another industry in Mount Isa, his partner continues to work in her existing job outside of the mining industry, his family continue to contribute to the local economy, his children remain at their existing school and the family continue to spend their money locally, attend local events and use local infrastructure and support services.

Another possible scenario is for Council to focus on local replacement of the existing copper mine workforce. For example, when Joe loses his job with the closure of the copper mine, he is unable to find work locally and both he and his family leave town. They might be replaced with a new family or someone without dependents who works in the energy sector. This family or individual could potentially continue to bolster the local economy in the same way as Joe, but they would not be an existing community member. While they would replace or potentially add to the existing population, they would also contribute to reshaping the location population and Mount Isa's overall identity.

Access to this type of detailed information was not available for this analysis, however, it is recommended data collection and analysis be included in future work.

A.3 Mechanisms required to support the transition

To successfully navigate a transition a certain amount of intervention and capacity building is required to develop and deliver the transition plan. To support the assessment of the energy projects in this context, two case studies were reviewed to understand factors which may require further investment and effort to ensure the realisation of the transition objectives. The two case studies highlight communities that have navigated similar transitions to the one facing Mount Isa - the Newcastle steelworks closure and the Latrobe Valley Power Station closure. It should be noted these case studies are relatively high-level and further engagement and research may be worthwhile by Mount Isa City Council to leverage their learnings.

A.4 Newcastle steelworks closure

Overview

In the early 1980s, the global demand for steel collapsed, competition from steel producers in Asia grew and Newcastle steelworks' profitability dropped. Efforts were made to restructure the business and financial support was provided by government, but production continued to decline. Over a 15-year period starting in 1982, the Newcastle steelworks shed around two thirds of its over 12,000-strong workforce. In 1997, BHP announced that the Newcastle steelworks (opened in 1915) would close in 1999. Nearly 4,000 employees and contractors lost their jobs when the main section of the steelworks closed, and Newcastle's unemployment rate rose above 10%. The steelworks' average employee was 44 years old with an average length of service of 21 years. It was reported that "widespread fears that the steelworks closure would imperil the Newcastle economy, fracture social cohesion, devastate workers and their families, and increase violence and crime did not come to pass. Instead, some view the steelworks closure as a catalyst that led the regional economy to diversify, and the city to develop a new identity".⁴⁶

Managing Newcastle's economic transition

Newcastle's transition began over a decade and a half prior to the steelworks closure announcement.

In the early phases of the steelworks declining, targeted support was given by government to keep the steelworks competitive and also redevelop parts of the city's urban centre. In 1992, the state government established a new authority to drive redevelopment and revitalisation of parts of inner-city Newcastle – the Honeysuckle Development Corporation. This urban renewal effort created a more resilient socio-economic foundation for the city ahead of the shock of the steelworks closure announcement. BHP and the labour unions also established a more cooperative relationship through the negotiation of various initiatives in the years leading up to the closure announcement to improve the plant's viability and allow some workers to continue employment. In 1996, this cooperative relationship between BHP and the unions led to formation of the Transition Steering Team (TST) comprised of representatives from labour unions, non-union employees, and management.

Over the two-year notice period between 1997 and 1999, the community of wider Newcastle and the Hunter region mobilised to prepare for the closure. Following the closure announcement in 1997, a number of approaches were key to supporting Newcastle's transition including:

⁴⁶ [Closure-of-steelworks-in-newcastle.pdf \(sei.org\)](#)

- Locally led efforts to support workers, develop strategic economic and employment diversification strategies, and redevelop the steelworks site to support new industrial activity.
- TST assisted with negotiating redundancy packages and redeployment benefits for workers. TST also helped develop the Personal Pathways program to provide tailored support services for retraining and finding new jobs, mental health services and financial planning services.
- The Personal Pathways program was used by local employers to recruit staff, and BHP collaborated with tertiary providers and the NSW Department of Education to provide specific training for employees in industries where there were skills shortages (e.g. teaching). The program also provided special support for certain worker groups such as those aged over 40 or with disabilities.
- Outside of the steelworks, community interest groups and organisations joined to form the Common Purpose Group to develop a common vision for the economic development of the city and region. The group included representatives from business development, research and education institutions, regional development, industry, and unions and had connections to local business, community groups, local and state government.
- University of Newcastle coordinated with the Common Purpose Group to conduct a skills analysis to identify alternatives to the region's reliance on a single industry as well as how to diversify employment. The university assessed what type of skills and training it could deliver to support Newcastle's transition.

There are many elements that supported Newcastle's transition once the steelworks closed that sit outside of the scope of this report. However, a key factor included the extent of locally led transition efforts, where initiatives were led and 'owned' by those most impacted by the steelworks closure.

At a high-level, the approach to the close of Newcastle steelworks combined direct and tailored support along with regional economic development initiatives. Strong collaboration also underpinned the approach – collaboration between a variety of parties including BHP, unions, local, state, and federal government, education institutions and community and business groups.

A.5 Latrobe Valley power station closures

Overview

The Latrobe Valley's brown coal mines and power stations have produced most of Victoria's electricity for much of the last 100 years.⁴⁷ With Victoria's transition from coal to more renewable energy sources underway, Hazelwood power station and mine was closed in 2017, and Yallourn and Loy Yang power stations and mines are currently scheduled for closure in 2028 and 2035 respectively.⁴⁸

The Latrobe Valley's population is approximately 77,000.⁴⁹ The closure of the Hazelwood resulted in the loss of 750 direct jobs. The planned closure of Yallourn in 2028 is expected to result in the loss of over 1,000 jobs, similar to the amount of direct job losses expected on closure of the Loy Yang in 2035.⁵⁰

The Latrobe Valley faces a need to accelerate diversification of the region's economy to enable it to thrive into the future.

⁴⁷ [Latrobe Valley coal mines - Resources Victoria](#)

⁴⁸ [Latrobe-Valley-Regional-Rehabilitation-Strategy-Amendment.pdf \(resources.vic.gov.au\)](#)

⁴⁹ [2021 Latrobe Valley, Census All persons QuickStats | Australian Bureau of Statistics \(abs.gov.au\)](#)

⁵⁰ [Latrobe City Council Submission - Inquiry into Closure of Hazelwood and Yallourn.pdf](#)

Managing the Latrobe Valley's transition

Latrobe City Council developed a transition plan to tackle the challenges and opportunities presented by the closure of its brown coal mines and power stations, and, in their own words, pursue the "opportunity for our Regional City to reinvent itself. For us to see our City in the new light with new opportunities."⁵¹ *Transition Latrobe 2021-2025*, builds on its community vision and other key plans developed in collaboration with the community. It also highlights the need to partner closely with State and Federal government, partners, and the community to support a successful transformation.

A Latrobe City Transition Task Force was formed by Council as a governance framework for bi-partisan support from Government and the Opposition to collaborate to inform priority investments in the region, diversify the economy and create jobs. It brings together State and Federal Government and Opposition and is supported by the Government, industry, and a Business Reference Group.

Significant State and Federal government investment has been provided to support the Latrobe Valley's transition, including a \$266 million Latrobe Valley Support Package established by the Victorian Government following closure of the Hazelwood Power Station and mine.

The Latrobe Valley Authority was also established by the State government in 2016 to support the Latrobe Valley and Gippsland navigate a sustainable economic transition.

The initiatives above have a shared focus on:⁵²

- Delivering major and community infrastructure, events and programs to delivery local economic stimulus, boost liveability and attract visitors.
- Collaborating with community, business, industry, and government to support economic diversification and long-term sustainable prosperity.
- Providing support for workers impacted by mine and power station closures.
- Identifying growth sectors and increasing the skill base of local employers and workers in these sectors.
- Maximising local procurement.
- Aligning education and training programmes to growth industries.

There are similar principles and lessons to be learnt from both the Newcastle and Latrobe Valley case studies including:

- Importance of high levels co-design and engagement at an enterprise level (e.g. workforce, unions) and at a community level (e.g. community groups, businesses).
- Alignment and participation across all levels of Government – particularly local and state authorities.
- Needing a long-term plan and being patient with its realisation.
- Proactively partnering to build capacity and knowledge (e.g. through trans-disciplinary approaches and groups and/or partnerships with institutions such as Universities).
- Integrating economic and community development programs.
- Seeking to leverage existing capability to attract replacement industries and technologies as well as diversify the economic and industry base to reduce reliance on just one sector.

⁵¹ [Latrobe City Advocacy Plan Design - final2.pdf](#)

⁵² [About us - Latrobe Valley Authority \(lva.vic.gov.au\)](#)

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Response to the closure of Mount Isa copper mine and copper concentrator in 2025

Page 72 of 75

B. Long list of options

Refer to the attachment '**MICC_Energy Development Options Screening Assessment_MICC and MM comments.xlsx**'

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C. Assessment of shortlisted options

Refer to the attachment '**MICC_Detailed Assessment Framework**'

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Page 74 of 75

D. Stakeholder consultation notes

Refer to the attachment '**MICC_Consultation Schedule.xlsx**'

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Delta Pearl
Partners

The Diversification and Transformation of the Mount Isa Economy - Resources Pillar – Summary Final Report

Prepared for Mount Isa City Council

21 June 2024

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Table of Contents

EXECUTIVE SUMMARY	5
1. INTRODUCTION.....	9
1.1. THE PROJECT	9
1.2. THE RESOURCES PILLAR	9
1.3. PHASE 1: IDEAS GENERATION: ACTIONS AND INVESTMENTS FOR THE RESOURCES SECTOR.....	11
2. THE MOUNT ISA ECONOMY	12
2.1. THE NWMP AND CRITICAL MINERALS	12
2.2. THE ROLE OF GLENCORE IN THE ECONOMY AND THE IMPACT OF ITS CLOSURE.....	17
2.3. MANAGING ECONOMIC TRANSITION - THEORY.....	18
2.4. POLICY CONTEXT.....	19
3. RAPID IMPACT ASSESSMENT FRAMEWORK	22
4. OPTIONS FOR CRITICAL MINERALS AND TAILINGS.....	23
5. MAPPING STATE AND FEDERAL FUNDING AND FINANCING PROGRAMS.....	24
6. TECHNICAL ASSESSMENT OF MINE VIABILITY AND PROSPECTS.....	25
7. NWMP STUDIES AND EARLY WORKS FUND	26
8. AUSTRALIAN CRITICAL MINERALS INVESTMENT DATABASE.....	27
9. GLOBAL CRITICAL MINERALS EXCHANGE.....	28
10. PRODUCTION OF SULPHURIC ACID	28
11. AUSTRALIAN CRITICAL MINERALS HUB IN MOUNT ISA	28
12. STAKEHOLDER CONSULTATIONS.....	31
13. ADDENDA	33
14. CONCLUSIONS AND NEXT STEPS	34
APPENDIX A: MOUNT ISA/GLOBAL CRITICAL MINERAL ENDOWMENT LISTS.....	36
APPENDIX B: PROJECTS / DETAILS	43
NWQROC - WASTE MANAGEMENT POLICIES.....	43
EVA COPPER MINE.....	43
MOUNT ISA TECHNOLOGY METALS HUB (SMI).....	44
QUEENSLAND POLICY PLATFORM (AMEC)	45
GREEN ADVANCED MINERALS PROCESSING FACILITY IN MOUNT ISA.....	46

Table of Figures

Figure 1: The six pillars of the economic base.....	10
Figure 2: The North West Minerals Province	12
Figure 3: Critical Minerals in Queensland	13
Figure 4: Resource, major projects and infrastructure in Queensland	14
Figure 5: Map of granted mining leases around the Mount Isa region including North West Minerals Province	15
Figure 6: Map of granted mining leases and exploration leases around the North West Minerals Province	16
Figure 7: Map of latest geochemical analyses of ores across the Northwest Minerals Province.....	23
Figure 8: Mine waste sites (tailings dams and mullock heaps) across the North West Minerals Province.	24

Executive summary

Mount Isa is one of Australia's most productive economic regions. Its economy is driven by the resources sector, in particular the operations of Glencore which operates, inter alia, the 100-year-old Mount Isa Mine. However, emanating from this cornerstone project is a geographically spread, diverse and nationally significant economic ecosystem which underpins a vital society and economy across northern Australia. This, in turn, sits at the centre of the world-class North West Minerals Province (NWMP).

In late 2023 Glencore, the operator of Mount Isa Mines, announced major changes to its operations. It announced that it will close its underground copper mine and copper concentrator in Mount Isa. The mine is expected to cease operations in 2025, and the smelter in 2030. There will be a significant impact on the economy and society of Mount Isa, with the loss of 1,200 direct jobs and the potential for even greater losses in the service sector supporting the whole mining region. Larger effects, though, will, in fact, be felt further afield.

Many other projects and businesses that are underpinned by the operations of the copper mine and smelter will be adversely affected, as will Townsville, the corridor between Mount Isa and Townsville, and to a lesser but not immaterial extent Cairns and Brisbane. The Queensland and Australian treasuries will be directly negatively affected by the Glencore business decision, with their combined taxation and royalty incomes potentially to decline by several hundred million dollars per year.

The value and security of the local economy is at risk in the face of these closures. Mount Isa City Council has determined that it needs to diversify its economy and achieve structural transformation in order to avoid diminishing levels of wealth, population, standards of living, as well as the likely onset of increased social problems. In recognition of the shock to the economy, the Queensland Government is providing an initial small support package to the Mount Isa region, with up to \$20 million for mine workers and the Mount Isa community and up to \$30 million to accelerate development of resource projects in the NWMP over the next five years. Beyond this initial Queensland Government grant program, Council is investigating pathways for investments across six identified pillars of the economic base, namely resources, critical infrastructure, energy, agriculture, tourism, and small and medium business. Of all the competing priorities that lay ahead in the diversification and transformation journey, Council made it clear that job replacement and population retention and growth were most critical.

Focusing on the resources sector, this report proposes pathways to realise investment and accelerate project development to facilitate Mount Isa's shift to a new economy. This forms Phase 1 of the project, with Phase 2 to follow from July 2024 onwards. Phase 1: Ideas Generation, is focused on generating ideas and short-term actions relevant to the resources sector to prevent population loss and to support the Mount Isa economy and community. In Phase 2, the Execution Phase, Council will focus on execution of the high priority projects identified in Phase 1

Transition will require careful planning, stakeholder engagement, and a commitment by Council and the community to diversification and transformation. In addition, careful synthesis will be required of actions in the resources sector along with those recommended in the other five pillars identified by the Council, namely critical infrastructure, energy, agriculture, tourism, and small and medium business.

Project Opportunities

A large number of competing ideas seeking capital, whether private finance, government funding, or both, have arisen in response to the Glencore closure and the Queensland Government's support packages. This Resources Pillar project has produced a series of modular reports putting forward various key initiatives and programs for consideration.

This report summarises those and adds a list of potential projects for the Mount Isa region for Council's consideration, ranging from a new copper mine, a minerals processing facility, and a rail

connection to North Queensland through to tyre recycling and critical minerals opportunities in the surrounding the NWMP.

Rapid Preliminary Assessment Framework

Given the plethora of potential projects within the resources sector, the report proposes a framework for initial assessment of these projects. Although information on the array of competing projects will be limited in their initial stages, the Rapid Preliminary Economic Impact Assessment model developed by DeltaPearl Partners enables the comparison of these opportunities, examining timing, type and value of identified costs and benefits, with a particular focus on jobs. As well as assessing competing resources sector projects, the framework will aid in synthesising and comparing competing projects across all six economic pillars.

Technical Analysis of Mine Viability and Prospects

The Mount Isa region is rich in a wide range of base and precious metals. The area is unlikely to be exhausted of its potential. The technical analysis provided to Council recommends further progression of the Swan-Mt Elliott copper deposit which, of all the possible undeveloped mines in the region, evinces the most upside potential. The analysis also suggests common infrastructure investments, incentives for near-mine explorations, and 'pre- competitive' studies to support resource projects to maintain a pipeline of mining jobs in the region.

Some Key Findings

- An enormous amount of pre-competitive and pre-investment assessment and exploration of mineral potential has occurred in Mount Isa and the NWMP over many years. There are hundreds of prospective projects at various stages of development. The mineralisation of the region is widely accepted as world class. However, per extensive previous analysis by multiple agencies, many new projects do not go ahead, normally citing uncompetitive access to water, power, rail and other common user infrastructure. This is despite Mount Isa hosting major copper and critical mineral reserves. GeoSciences Australia and the Queensland Government's Department of Resources have excellent databases on the region's mineralogy which is accessible at low or nil cost by industry actors.
- The main economic citizen in Mount Isa is Glencore. It is crucial to understand and accept that Glencore views its interests as different to and separate from Mount Isa's. Glencore uses its economic and political power to advance its own interests. While this is normal and acceptable, it has to be recognised by policymakers that Glencore must be treated dispassionately and no less or more favoured than any other business. Having made its decision about the future of its underground copper mining and smelter operation, Glencore acted responsibly in alerting key stakeholders and providing advance notice. Glencore is well-placed to make further contributions to the prosperity of Mount Isa, and positive engagement with Glencore going forward is essential.
- Mount Isa's future prosperity will depend on having diverse economic sectors and multiple major industry players whose individual market power cannot excessively disrupt the economic future of Mount Isa and NWMP.
- The Australian Government has an extremely limited footprint in Mount Isa, despite the criticality of Mount Isa as a service centre for huge portion of northern Australia and despite its enormous productivity and wealth-generating capability. This can be remedied in a way that benefits both Mount Isa and the Australian Government through effective investment. Mount Isa is evidently a proven investment region. The Australian Government's newly announced Future Made in Australia policy is an example of the support of policy and funding support that Mount Isa needs and which should generate a significant return on investment.
- Mount Isa is world renown. Other major economies such as the United States, Japan and Korea will likely have an interest in seeing Mount Isa progress to its next stage of productivity.

- The Queensland Government has the most regulatory influence in the resources sector in Mount Isa but the Queensland Government's actual policy and cash investments in the region are low relative to the economic scale and capacity of Mount Isa.
- The economic ecosystem of Mount Isa and the surrounding region is enormously complicated and inter-dependent. This is a major risk to Queensland and Australia in terms of the security of supply chains, the pursuit of new policy goals in relation to renewable energy, decarbonisation and critical minerals development. Effective future-proofing of the inter-relatedness of all these facets of the eco-system eludes current policymaking arrangements and, in short, falls between the responsibilities of the three levels of government.
- The future of Mount Isa will not depend on the success of one company, mining project, or type of mineral. Rather, the overall ecosystem will benefit from a deliberate and long-running public sector investment program that shores up confidence and focuses on improving access to well-priced and highly efficient common user infrastructure.

Recommendations

The report recommends that initial investments focus on various opportunities that will foster near-term traction to prevent population, job losses and economic decline, as well as contributing to ongoing structural transformation. There are many of these, but key ones are summarised below.

- Continued exploration of options for critical minerals and characterisation of tailings: Most mine leases in the Mount Isa region have waste in their tailing dams and mullock dumps. Mine wastes contain a wide suite of elements including gold, copper, lead, zinc, silver, cobalt, antimony, rare earths, uranium, iron, cadmium, phosphates, and magnesium. Thus, there are opportunities to develop critical minerals in the mines' tailing dams and mullock dumps. Council should monitor and utilise the active research programmes on this topic by government and universities. Geoscience maintains a Critical Minerals Atlas¹ and has mapped and defined the resources of at least 63 mine tailings dams in the region. A separate report provides details. The University of Queensland is also progressing a body of work in this space.
- Mapping of funding and financing programs: Council should pursue large-scale federal funding and financing programs relevant to Mount Isa, including actively seeking updates on the \$50 million support package, the Queensland Jobs Fund, and the Regional Economic Futures Fund, as well as seeking to secure support from the Australian Government's Future Made In Australia fund to support proposals to bring about major new investment in Mount Isa, in particular in relation to common user infrastructure such as the smelter and production of sulphuric acid.
- a NWMP "Studies and Early Works Fund": The aim of the proposed Fund, centred around Mount Isa, is to co-fund miners to conduct feasibility, scoping, sampling, and early works on projects where costs of studies and risks of failure are high or unknown. The Fund, which should be substantial in scale, will generate value for Mount Isa and the region by bringing forward and de-risking mining projects to the next phase of operation, signal to businesses and community members that future opportunities are present in Mount Isa, and encourage the development of new technologies and techniques to extract critical minerals.
- an Australian-first "Critical Minerals Regional Hub": demand for critical minerals is growing rapidly and Australia is well placed to be a significant provider. A network of hubs across Australia would provide support for an end-to-end focus on the whole value chain from the mine to a processor to an end-user or manufacturer, thus encouraging critical minerals processing capabilities, and encouraging the development of processing and refining industries. Hubs would assist in coalescing mineral access, key infrastructure, and specialist

¹ <https://portal.ga.gov.au/restore/42745f84-70bb-4d42-a652-e212c2c56ffe>

capabilities and experience, which would drive efficiencies and attract investment at all stages of the value chain. Mount Isa's mineral, technology and infrastructure endowments mean it is ideally placed to become the first of a series of critical minerals regional hubs.

- an Australian Critical Minerals Investment Database centred on Mount Isa: the database would be an analytical and data visualisation platform that integrates up-to-date data on critical minerals – location, depth, quality, quantity, and metallurgy – as well as their related value chain – processing, logistics, manufacture, export, prices and markets. It would enable effective communication and planning for critical mineral opportunities, risks, constraints, and options for public agencies and private enterprise, easing the pathways for potential investors in critical minerals. If the platform was based and maintained within Mount Isa, it would provide new employment and training opportunities and otherwise help centre Mount Isa as an international critical mineral centre.
- a Global Critical Minerals Exchange: a critical minerals commodity exchange established in Mount Isa would act as a regional/national manager, regulator, and arbiter of the critical minerals market, employing futures trading to cover risk in markets vulnerable to supply-chain disruption and price instability. It would increase Australian and international understanding of markets and prices for critical minerals and rare earth elements, and centralise Australia's and Mount Isa's place in the global market. This opportunity also allows Mount Isa to leverage its mineral and resource potential into the development of a new, unique technology and digital opportunity.

This phase of the project, Phase 1: Ideas Generation, has focused on generating ideas and short-term actions to prevent population loss and to support the Mount Isa economy and community. In Phase 2, the Execution Phase, Council will focus on execution of the high priority projects identified in Phase 1. It will also be important for Council to synthesise the ideas across the six pillars identified to ensure that funds are allocated optimally.

1. Introduction

1.1. The Project

This project has been initiated by Mount Isa City Council and the Mount Isa Copper Mine Closure Taskforce (the Taskforce) in the context of the impending closure of the Glencore underground copper mine and copper concentrator in Mount Isa, announced by Glencore in mid-October 2023. The mine is expected to cease operations in 2025, and the smelter in 2030.

Mount Isa originally came into existence because of the rich mineral resources in the Gulf Country region and particularly the Carpentaria mineral province in which it is located. Over time, it has become a modern, family-friendly, multicultural city, home to 21,000 people, and the service centre of the region. There is “more to Mount Isa than mining” as Council states in the project description, and the strong community enhances its prospects of diversifying.

Nevertheless, there will be a significant impact on the economy and society of Mount Isa, with the loss of 1,200 direct jobs and the potential for even greater losses in the service sector (contractors, suppliers, businesses) that supports the mines in the region in the absence of intervention (estimated at around 3,600 jobs).

In response, the Palaszczuk government has announced a support package of up to \$50 million for mine workers and the Mount Isa community. Up to \$30 million will be allocated to accelerate development of resource projects in the North West Minerals Province (NWMP) over the next five years. Up to \$20 million, to be matched dollar-for-dollar by Glencore, will go toward an economic structural adjustment package for Mount Isa and North West Queensland.

The Queensland State Government and Council have set up a joint initiative – a Mount Isa Copper Mine Closure Taskforce (the Taskforce) – to respond to the economic transition challenge necessitated by Glencore’s reduced activities Mount Isa.

Hence, Council and the Taskforce are seeking advice on responding to the shock of Glencore’s closure and actions to accelerate the diversification and structural transformation of the Mount Isa economy, prevent population loss by determining near-term employment opportunities and ensuring future prosperity.

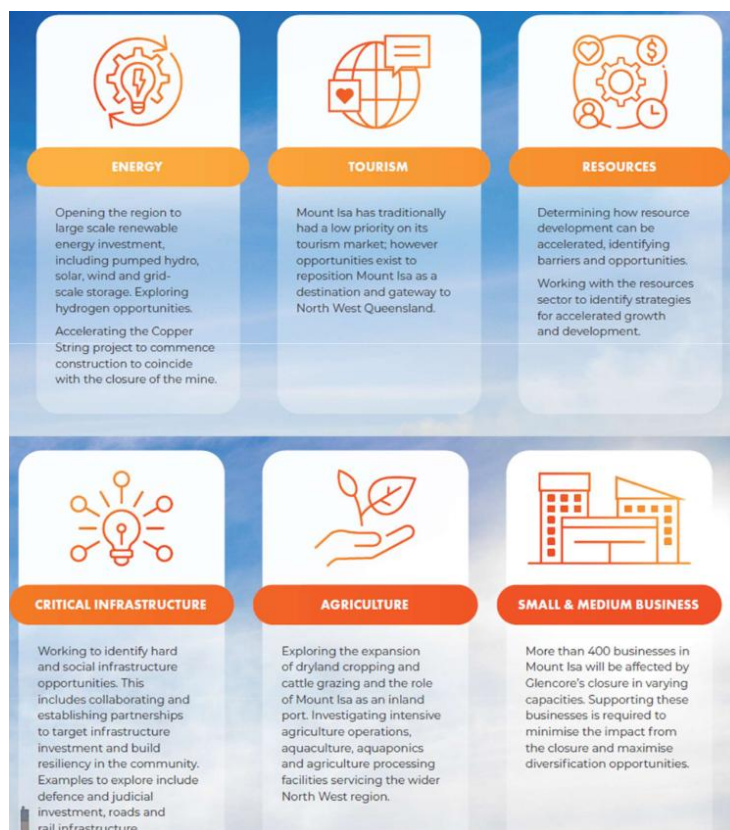
Council’s aims are to identify near-term employment opportunities, stem population loss, and to assist the region achieve structural transformation, gains in productivity and the attraction of people and new industries in the medium to long term.

During the life of the project, multiple modular reports have been submitted to Council – this report seeks to summarise all the foregoing reports and advice.

1.2. The Resources Pillar

Council and the Taskforce have identified six pillars of Mount Isa’s economic base – a key pillar being the resource sector and its potential to drive transformation into the future. The resources sector is the focus of this report. Five other identified pillars (critical infrastructure, energy, agriculture, tourism, and small and medium business) are being addressed separately.

Figure 1: The six pillars of the economic base



This project on the Resources Pillar is focused on establishing pathways to realise investment in this critical area. In particular, Council is seeking ways to accelerate resource development, and to determine barriers and opportunities.

Mining has underpinned the economy for many years, and indeed, was the reasons for Mount Isa's initial establishment, but diversification and structural transformation is required in the face of Glencore's closure and the shift to a new economy to avoid diminishing levels of wealth and reduced standards of living for residents.

Definitions of resources, the region, and a key focus, critical minerals, for the purposes of the project are provided below.

Definitions for the Purpose of the Project

Resources: Resources are defined broadly to include hydrogen, water, limestone, land, and renewable energy, and the (ageing) workforce, but with a key focus on critical minerals.

Critical minerals: Critical minerals are also defined in a broad sense, and not limited solely to the Federal Government's list of critical minerals, which excludes copper, nickel, phosphate,

and uranium. The Mount Isa, Queensland Government and the QRC lists are taken into account.²

The region: The region is defined as not only the Mount Isa LGA but also the broader North West Minerals Province (NWMP) given that contractors from Mount Isa service a broad region of North West Queensland, and given the abundant mineral wealth of the NWMP.

1.3. Phase 1: Ideas Generation: Actions and Investments for the Resources Sector

To achieve pathways to realise investment and accelerate resource development, this report provides a summary of the multiple other reports that have been produced:

- an overview of key features of the economy of Mount Isa and the NWMP and the surrounding policy context
- a review of critical minerals and other resources present in the region
- a review of Australian and international critical minerals lists
- an initial list of potential key projects for consideration for the Mount Isa region
- a framework for initial assessment of projects based on input-output analysis
- options for critical minerals and tailings
- a mapping of relevant State and Federal funding and financing programs
- a technical analysis of mine viability and prospects
- recommendations to facilitate foster near-term projects and ongoing structural transformation by establishing:
 - an NWMP “Studies and Early Works Fund”
 - an Australian-first “Critical Minerals Regional Hub” for the North West Minerals Province centred on Mount Isa
 - an Australian Critical Minerals Investment Database
 - a Global Critical Minerals Exchange

Transition will require careful planning, stakeholder engagement, and a commitment by Council and the community to diversification and transformation. Mount Isa will need to examine the restrictions to its transition and structural transformation and aim to remove as many as possible to help turn the economy around. Improving transportation and communications infrastructure will enhance connectivity, and attracting people to the region initially through tourism and longer term through liveability and vitality of the centres are some of the actions that are likely to be required.

In the shorter term, transition will require support for the community and for small businesses (contractors, service providers, etc.) affected by the mine closures, and also to encourage the growth of new small businesses in non-mining related sectors, which will foster entrepreneurship and job creation.

² (https://www.resources.qld.gov.au/_data/assets/pdf_file/0005/1726430/critical-minerals-strategy.pdf; <https://www.allens.com.au/insights-news/insights/2023/12/critical-minerals-list-expands-and-new-strategic-materials-list/>)

2. The Mount Isa economy

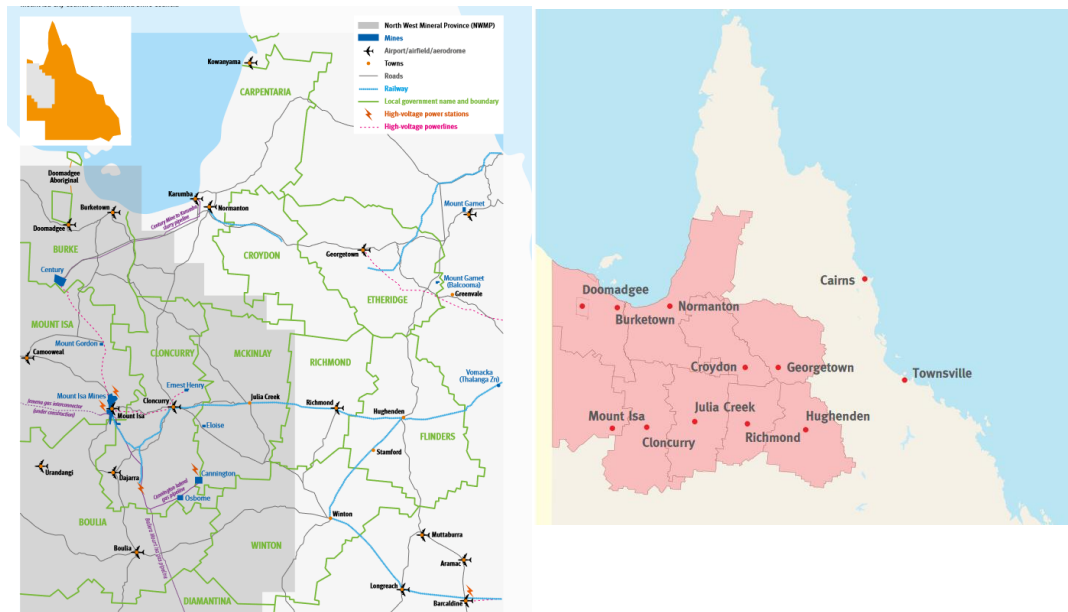
Mount Isa is located in North West Queensland with a population of just over 18,000 people. It is the largest population centre located within the NWMP, a key region for Queensland’s resources industry. The closest city to Mount Isa is over 800 km away, which leaves Mount Isa as a primary services hub for the region, with its healthcare sector being a major employer in the area.

For the purposes of the project, the region is defined as not only the Mount Isa LGA but also the broader NWMP given that contractors from Mount Isa service a broad region of North West Queensland, and given the abundant mineral wealth of the NWMP.

2.1. The NWMP and critical minerals

Mount Isa sits in the middle of arguably the most prospective and highly endowed mineral regions in the world, the NWMP.

Figure 2: The North West Minerals Province³



The NWMP is rich in critical minerals, including cobalt, copper, gallium, gold, iron, lead, magnetite, molybdenum, phosphate, rare earth elements, rhenium, silica, silver, sulphur, uranium, vanadium, yttrium, and zinc as important minerals, all of which are identified as important by the Queensland Government.

Although critical minerals are found across Queensland, they are concentrated in North West and North East Minerals Provinces—from Mount Isa in the west to Townsville in the east, a distance of nearly 1, 000km (see the map below).

³ Source: https://www.statedevelopment.qld.gov.au/_data/assets/pdf_file/0009/12231/nwmp-strategic-blueprint.pdf; https://www.statedevelopment.qld.gov.au/_data/assets/pdf_file/0022/77512/nwqeds-implementation-plan-2025.pdf

Figure 3: Critical Minerals in Queensland

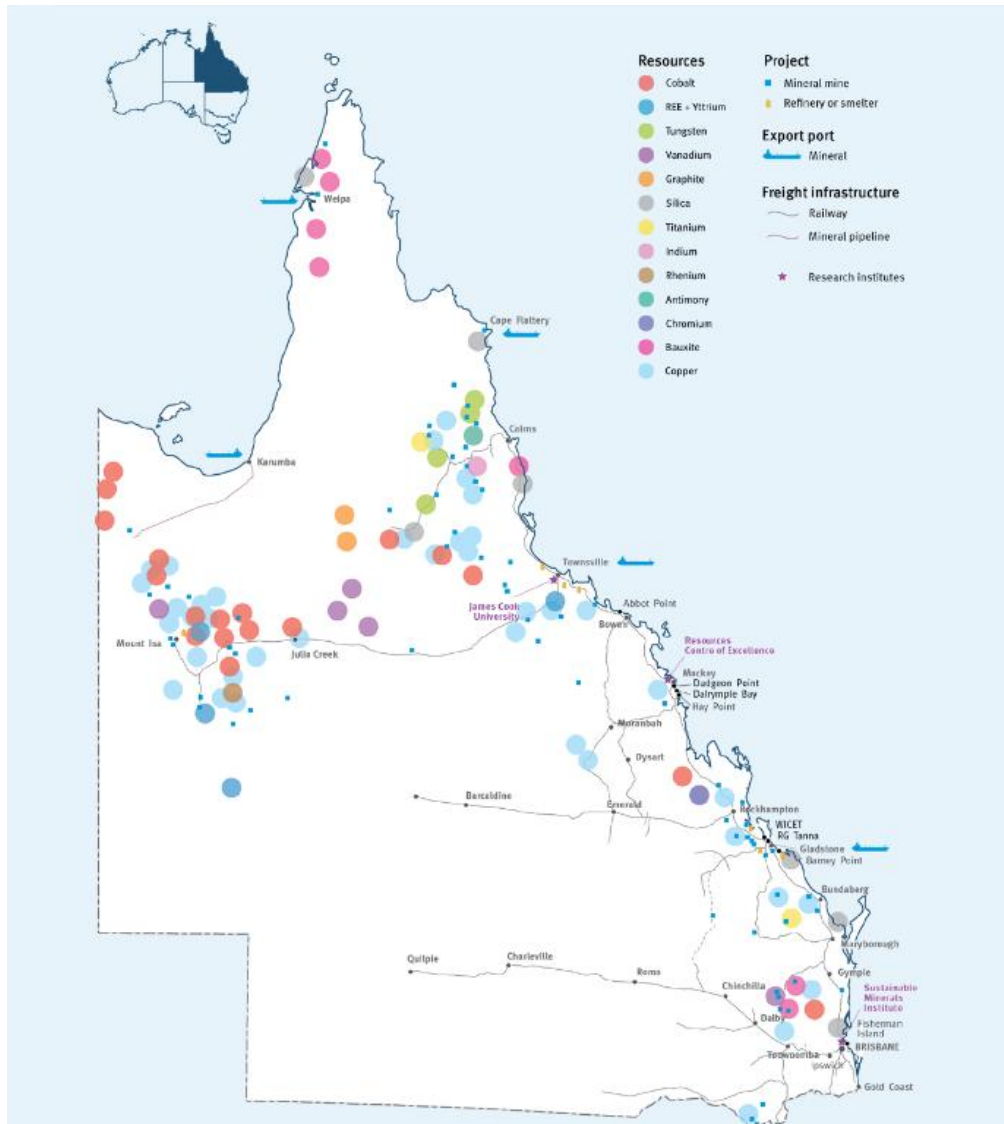
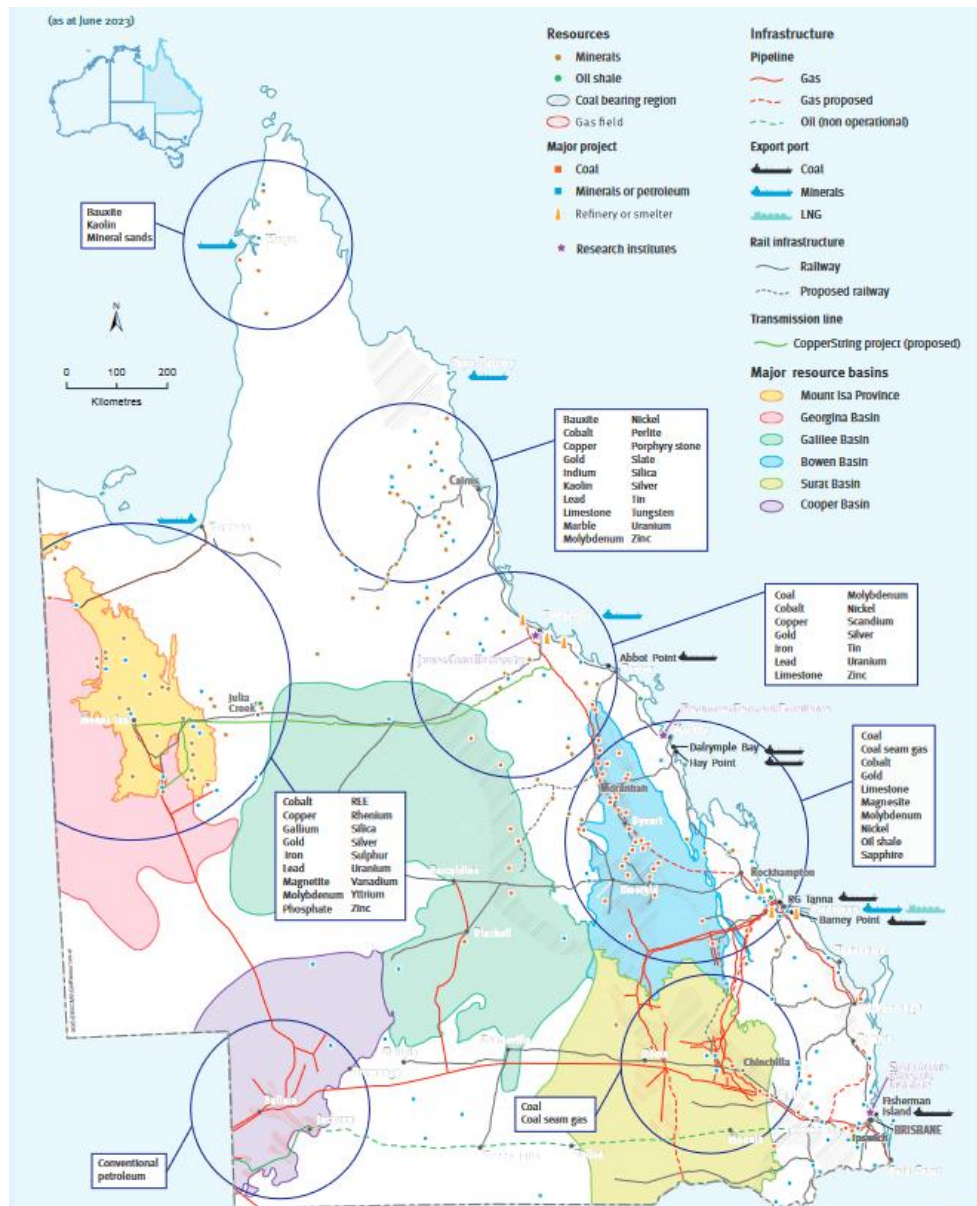


Figure 4: Resource, major projects and infrastructure in Queensland



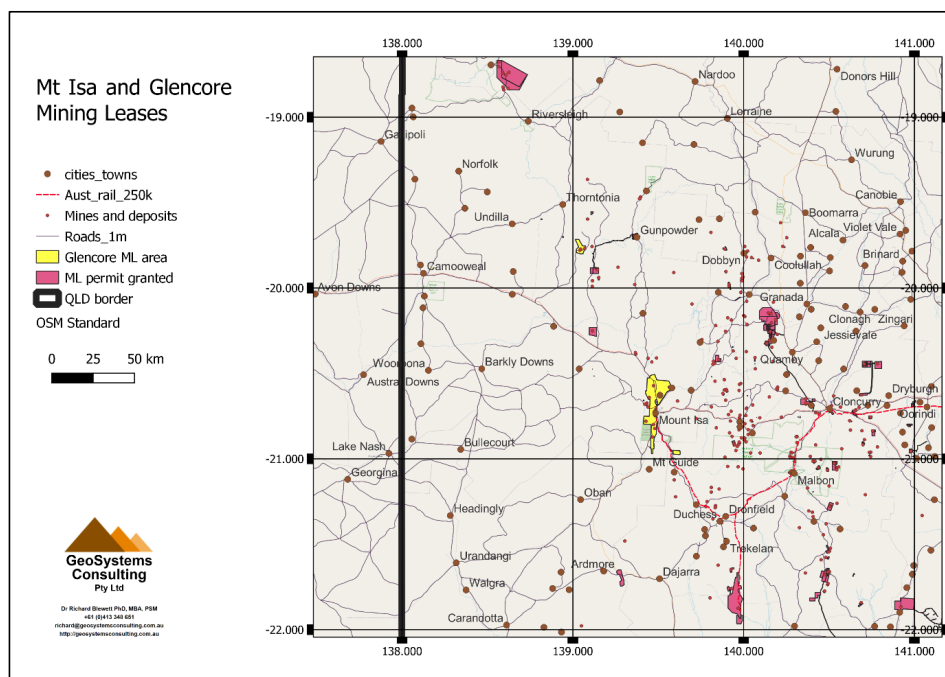
Large copper and zinc-lead-silver ore bodies define the Mount Isa region and its economy. The Mount Isa copper orebody is estimated to be 82.9 million tonnes (Mt), down from 300 Mt before mining operations began over 90 years ago. The zinc-lead-silver orebody is estimated to be approximately 11.2 Mt down from 395 Mt before mining operations began^{4,5}.

Currently, Glencore operates three copper mines and two zinc mines in addition to concentration facilities for copper and zinc-lead, and smelters for copper and lead.

Alongside Glencore’s operations many smaller mines operate in the region, extracting copper, zinc, gold, silver, lead, granite, and other minerals. Companies have begun exploring the region for rare earth elements (REEs) and other critical minerals, as well as examining options for extraction from existing waste streams.

The figure below shows granted mining leases around the Mount Isa region including North West Minerals Province.

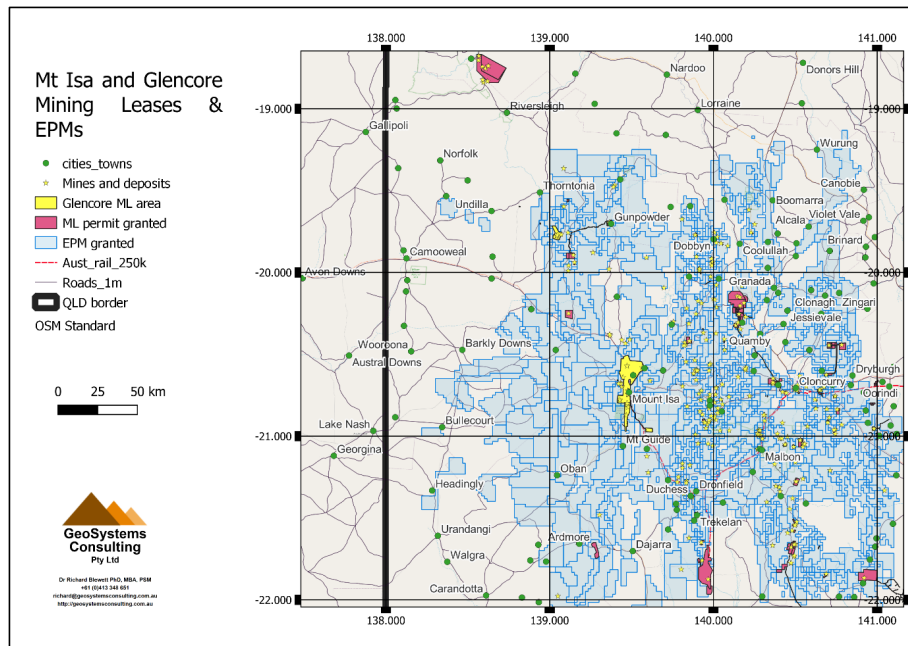
Figure 5: Map of granted mining leases around the Mount Isa region including North West Minerals Province



⁴ Sustainable Material Institute (2020), *North West Mineral Province Deposit Atlas*, [Online], Available at: <https://geoscience.data.qld.gov.au/data/dataset/ds000037/resource/59dad67-7ef8-420f-833a-21c01c8908ba>

⁵ Mount Isa Mines, (n.d.), *Mount Isa Project Summary*, [Online], Available at: <https://www.mountisaminerals.com.au/mount-isa-project/>

Figure 6: Map of granted mining leases and exploration leases around the North West Minerals Province



Critical minerals are defined by the Australian Government as metallic or non-metallic elements found in the earth that are crucial for modern technologies, economies, or national security and have supply chains that are at risk of being disrupted.⁶ Copper and zinc are but excluded from the Australian Government's Critical Minerals List because their supply chains are not restricted, but included on its Strategic Minerals / "watch" list because of their importance to the economy. Related analysis prepared for this project shows the alignment between Australian and international critical minerals lists and the endowments in Mount Isa and the NWMP; see Appendix A.

Thus, Mount Isa and the surrounding region host known critical mineral deposits and existing infrastructure. New investment and technology across the value chain, closely linked with Australia's strategic international partners, could produce compounding economic benefits in a global economy where demand for critical minerals is forecasted to grow at exorbitantly over the coming decades⁷.

⁶ <https://www.statedevelopment.qld.gov.au/news/what-are-critical-minerals-and-why-are-we-mining-them-in-queensland>
⁷ International Energy Agency, (2021), *The role of critical minerals in clean energy transitions*, [Online], Available at: <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions>

The North West Minerals Province

Since 1923, Mount Isa and the North West Minerals Province (NWMP) has had an internationally significant reserves of key minerals and metals, including copper.

The NWMP holds some of richest deposits of new world minerals that will be key to enable Queensland's ever increasing urgency to transition to a carbon free economy. As an example, Merlin Mine owned by Chinover has the world's highest grades for molybdenum, this mine has had decline and new unused treatment plant sitting on site for several years, there are reasons why resources in the region remain undeveloped.

The wealth of critical minerals is vast based on known exploration data gathered over many decades and more recently through record mineral exploration, most of which targets critical minerals and the NWMP.

The Queensland government's list of minerals in the NWMP includes cobalt, copper, gallium, gold, iron, lead, magnetite, molybdenum, phosphate, REE, rhenium, silica, silver, sulphur, uranium, vanadium, yttrium, and zinc.⁸

2.2. The role of Glencore in the economy and the impact of its closure

Currently, Glencore operates three copper mines and two zinc mines in addition to concentration facilities for copper and zinc-lead, and smelters for copper and lead. Alongside Glencore's operations many smaller mines operate in the region, extracting copper, zinc, gold, silver, lead, granite, and other minerals. On 18 October 2023, Glencore announced that after 60 years of copper mining and a six-year extension beyond its original expected life of mine, the Mount Isa Mines underground copper operations (Enterprise, X41 and Black Rock) and copper concentrator will close in the second half of 2025. Over the next two years, Mount Isa Mines will transition operations to focus on long-life zinc assets, and copper smelting and refining operations in North Queensland.

The planned closure of the Mount Isa Mines underground copper operations and copper concentrator poses the closure of an existing, long-standing and essential employer and local (Mount Isa, North West and Townsville), State and national economic contributor. In the Mount Isa region, Glencore's impact on the economy is as follows:⁹

- 4,450 direct jobs
- \$524 million wages and salaries
- 2,130 suppliers
- \$1.70 billion goods and services spend

⁸ <https://geoscience.data.qld.gov.au/dataset/ds000036>

https://www.australianminerals.gov.au/_data/assets/pdf_file/0017/91241/emerging-strategic-minerals-in-qld.pdf

⁹ All dollar figures are in AUD and relate to the 2022 calendar year. The federal income taxes figures represent Glencore's share of our Australian operations. All other figures, including royalties, represent 100% of the operations that Glencore manages, or participates in, in Australia and include any joint venture partners' interests. Total economic activity is measured using Gross Value Added, an estimate of the value of goods and services produced in an economy. Flow-on jobs and economic activity were estimated using ABS data in an Input-Output model developed by EY, measuring the indirect and induced impact of Glencore's operations.

The closure of underground copper mines and the copper concentrator will have a significant impact to the Mount Isa community and economy. Glencore estimates that the assets earmarked for closure and well as supporting services employ around 1,200 people all of which will be impacted.

Additionally, contractors and other industries along the supply chain are likely to be affected. With Mount Isa Mines' closure announcement come risks associated with future structural unemployment and a lack of options for young people in the region.

Glencore stated that it will continue to invest in the long-term future of Mount Isa Mines, including the George Fisher Mine with a current life of mine to 2036, and the zinc-lead concentrator and lead smelter. Glencore also expect the copper smelter and refinery to continue operating to 2030, subject to approval of additional capital investment.

A separate report on the *Background on the Role of Glencore in the Mount Isa Economy and the North West Minerals Province* provides more detail on Glencore's role and expectations post-closure, including near-term prospects for mining. David Wilson, founder and managing director of Transition Resources commented on the importance of focusing attention on near-term mines.

Directing funds to exploration creates mines in 10 or 15 years ... But allocating funds to near-term mines now will generate replacement jobs in a timeframe that matters to these 1200 workers. It also produces ore for toll treating at the Mount Isa concentrator and creates much-needed economic stimulus for the region. ... By keeping the Mount Isa concentrator going, potentially for at least another four years, it saves hundreds of jobs. This gives everyone time to find alternatives, and for the government to accelerate the new Queensland Critical Minerals Strategy. Regardless of whether the Glencore concentrator stays open or not, and the preference is for it to stay open, there's still an argument for the Queensland Government to fund and bring other near-term mines forward, by utilising toll treating options available at other processing plants in the North West Minerals Province.

The continued operation of Glencore's copper concentrator enables near-term mines in the region to enter production – by feeding ore to the Glencore mill – subsequently creating replacement jobs for the 1200 workers. The region is rich with near-term mining opportunities suited to toll treating development models. These often require only modest up-front capital to bring online, because there is no need to build processing plants or tailings facilities. There are opportunities to develop critical minerals in the tailing dams and mullock dumps. There are active research programmes on this topic by government and university personnel. Wilson's research identified at least 15 million tonnes of copper ore in the North West Minerals Province that could be funded and progressively brought online from 2025, subsequently feeding Glencore's concentrator.

Near-term producers include Wilson's own company Transition Resources, Austral Resources, Hammer Metals and Aeris Resources at its Barbara underground project. Aeris executive chair André Labuschagne said a prudent way for the Queensland Government to support the North West Minerals Province would be – as Wilson suggested – to fund projects that could produce in the next two-to-three years.

2.3. Managing Economic Transition - Theory

With the withdrawal of Glencore, Mount Isa as a region is facing a difficult economic future unless there are significant changes and acceptance from the residents of those changes. Mining has underpinned the economy for many years, and indeed, was the reasons for Mount Isa's initial establishment, but change will be required to meet the new economy, or residents are likely to experience diminishing levels of wealth and reduced standards of living.

Transitioning to the 'new economy' for Mount Isa in the face of Glencore's closure of the Mount Isa copper mine will require careful planning, stakeholder engagement, and a commitment to diversification of the economy. It will be highly important to ensure a just and equitable transition for workers, businesses, and the community, and to determine constraints, essential inputs, and pathways and projects for the short, medium and longer terms.

Taking into account theoretical principles for diversification and transition will be important in ensuring a successful future for Mount Isa.

Principles for successful diversification and transition

- Ensure short-term support in response to the economic shock is combined with medium and longer-term measures
- Consider the Mount Isa region's relative strengths and inherent advantages
- Incorporate the views and knowledge of regional communities and businesses
- Identify barriers to people or businesses adjusting, including any regulatory barriers
- Enhance the capabilities of people - improve human capital through better targeted and/or improved access to new training and skills education
- Enhance regional connectivity and infrastructure to support regional development
- Conduct rigorous strategic regional planning and cost-benefit analysis of proposed programs, policies or strategies

2.4. Policy context

Assessment of the appropriate actions and investments for Mount Isa City Council takes place in the context of policies highlighting critical minerals at the national, state, and international levels, and rapidly growing demand for such minerals. The policy context also encompasses efforts to decarbonise and establish a clean economy at all levels of government, ranging from global efforts to regional, such as the NWQ resource recovery strategy for waste recovery. In addition, there are policies encouraging diversification at the regional level, specifically the North West Minerals Province - Economic Diversification Strategy.

The support from the Queensland Government provided to Mount Isa is intended to complement other government initiatives and investment – including the Critical Minerals Strategy, Infrastructure Pipeline projects, the NWQ Economic Diversification Strategy, the Regional Transformation Strategy, and Regional Economic Futures Fund. Related programs of work at the local level include Glencore's Social Transition Plan, and Mount Isa City Council – Transitioning Mount Isa's Economy.

Critical and Strategic Minerals Policies

Critical minerals are metals and non-metals which are considered vital for the economic well-being of the world's major and emerging economies. However, the supply critical minerals globally may be at risk due to geological footprint, access and development, geopolitical issues, trade policy or other factors, including supply chain logistics. Among these important minerals are metals and non-metals used in the manufacture of battery energy storage systems, mobile phones, flat screen monitors, wind turbines, electric cars, solar panels, and many other high-tech applications.¹⁰ In 2020, the World Bank estimated that the production of minerals, such as graphite, lithium and cobalt, could increase by nearly 500% by 2050, to meet the growing demand for clean energy technologies.¹¹

Recent targets set by nations across the world to reach net zero climate goals have contributed to this increase in demand for critical minerals. In the Net Zero Emissions step change scenario (which is compliant to the Paris Agreement), the value of critical minerals is expected to triple by 2050,

¹⁰ Australian Government, Clean Energy Regulator (2024), *Related industries: critical minerals*, [Online], Available at: <https://cer.gov.au/news-and-media/case-studies/related-industries-critical-minerals>

¹¹ World Bank Group (2020), *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*, [Online], Available at: <https://pubdocs.worldbank.org/en/961711588875536384/Minerals-for-Climate-Action-The-Mineral-Intensity-of-the-Clean-Energy-Transition.pdf>

equating to US \$400bn, where the combined market size for wind turbines, solar panels, lithium-ion batteries, electrolysers, and fuel cells represents a cumulative market opportunity to 2050 worth US \$27trillion.¹² It is understood that batteries have the largest share with 60% of the total cumulation, this mainly comes from the central role batteries will play in new energy economy through electric vehicles and energy storage. There is also growing recognition of the importance of critical minerals in the manufacturing of many new and emerging technologies such as super alloys, magnetic products, fibre optic cables, advanced electronics, lasers, photovoltaics, and rechargeable batteries.

As technological development continues to accelerate, the demand for critical minerals continues. As such, Federal and State Governments have recognised that with Australia's extensive mineral supply, we are well placed to be a significant provider of critical minerals, including as a processor and value-add manufacturer.

In common with many governments around the world, the Australian Government issues a Critical Minerals List, which was recently revised in December 2023 and currently includes 30 minerals. The List defines critical minerals as follows:

Critical minerals are metallic or non-metallic materials that are essential to our modern technologies, economies and national security, and whose supply chains are vulnerable to disruption. Risks of disruption to critical mineral supply chains are heightened when mineral production or processing is concentrated in particular locations, facilities or companies., Critical Minerals Strategy 2023–2030 (industry.gov.au)

Dedicated critical minerals support and finance is available from the Australian Government for their extraction, processing and market development.

In addition to the critical list, the Australian Government recently began to issue a shorter "Strategic Minerals List"; the six strategic materials identified are aluminium, copper, nickel, phosphorus, tin, and zinc. They are not considered critical because supply risks are lower than those on the critical minerals list, but they are considered important such that the government intends to support the extraction and processing, and monitor market developments. The Queensland Government has issued a Critical Minerals Strategy which identifies cobalt, copper, gallium, gold, iron, lead, magnetite, molybdenum, phosphate, rare earth elements, rhenium, silica, silver, sulphur, uranium, vanadium, yttrium, and zinc as important minerals.¹³ Reports detailing the Australian, Queensland, and international critical minerals lists and the Mount Isa minerals endowments, including the NWMP, have been provided to Mount Isa City Council.¹⁴ Minerals in the NWMP that are not included on the Critical Lists are cadmium, copper, gold and iron, lead and phosphates, silver, yttrium and zinc.

Local and regional policies

At the regional level, relevant policies include the *North West Minerals Province - Economic Diversification Strategy and NWQROC Waste Management Plan*. The North West Queensland Economic Diversification Strategy identifies opportunities across the resources, agriculture, tourism, business and industry sectors to support long-term sustainable growth in North West Queensland. The Strategy is a key deliverable of A Strategic Blueprint for Queensland's North West minerals Province and is structured around three key themes: enhanced investment environment, strong supply chains, and sustainable communities, with initial actions focusing on a drone facility and minerals for renewable, medical and defence technologies. The NWQROC Waste Management Plan was developed by the 10 councils, including Mount Isa City Council, that are members of the North West Queensland Regional Organisation of Councils (NWQROQ). The waste management plan is designed to assist the region to meet ambitious waste management targets by leveraging economies of scale through cooperation.

¹² International Energy Agency (2020). *Net Zero by 2050 – A Roadmap for the Global Energy Sector*, [Online]. Available at: https://iea.blob.core.windows.net/assets/deebef5d-0c34-4539-9d0c-10b13d840027/NetZeroBy2050-ARoadmapfortheGlobalEnergySector_CORR.pdf

¹³ Personal communication, Ross Thisbee.

¹⁴ DPP - Mt Isa - International Lists of Critical Minerals and Alignment with Mount Isa including the NWMP.

The Mount Isa Economic Development Strategy 2023-2028 is relevant to Mount Isa's vision and objectives for its economy and society. It sets out six objectives to achieve the vision of "Mount Isa, Moving Ahead," focus on the concepts of competitive industries, innovation and entrepreneurship, strategic infrastructure, a skilled workforce, liveability and equitable opportunities. Other relevant strategies include the Mount Isa Tourism Development Strategy 2020-2025, the Mount Isa CBD Master Plan, the Mount Isa City Council Sport and Recreation Strategy 2018-2027, the Mount Isa Youth Strategy, the Townsville and North West Queensland Economic Recovery and Growth Strategy 2020-2030, the North West Queensland Economic Diversification Strategy and the MITEZ Strategic Plan 2022-2025.

Other relevant 'clean economy' state and national policies and investments

Both the Australian and the Queensland Governments have a number of initiatives and strategies relating to decarbonisation and a 'clean economy' that are relevant to Mount Isa. The relevant policy context includes emissions and renewable energy targets, renewable energy infrastructure investments, and workforce initiatives. Examples are the National Safeguard Mechanism, the \$1.9 billion *Powering the Regions Fund (PRF)*, which supports trade-exposed industries to invest in low emissions technology and aids support industries providing critical inputs to clean energy industries, and the Gladstone Grid Reinforcement at the Federal level.

At the state level, the Queensland Government has committed to emissions and renewable targets in an Energy and Jobs Plan¹⁵ and reiterated these in the Climate Action Plan.¹⁶ It is also progressing with investments in renewables, such as the new Queensland SuperGrid to connect solar, wind, battery and hydrogen projects, and has established a \$570 million Battery Industry Strategy that aims to promote Queensland as a driving force in the development, manufacture and deployment of new energy storage technologies. Queensland's regions are expected to be key beneficiaries, playing a major role in successfully delivering the strategy, and reaping dividends through the creation of new jobs and more economic growth and long-term prosperity. In terms of workforce initiatives, the Queensland government has committed to a Job Security Guarantee for workers.

The Australian and Queensland Governments are designating certain regions as Renewable Energy Zones (REZs) to encourage investment in renewable energy projects and grid infrastructure in those regions. Queensland recently (July 2023) issued a draft 2023 Queensland Renewable Energy Zone Roadmap to progress the development of REZs, including in central Queensland, and the development and connection of solar and wind generation resources to the grid. There are 12 potential future REZs to be developed across three phases to 2035, spread across the Southern, Central, and Northern (including North and Far North Queensland) regions. The Government has allocated \$6 million to undertake Strategic REZ Readiness Assessments for each region.

¹⁵ <https://www.qld.gov.au/about/newsroom/queensland-energy-and-jobs-plan>

¹⁶ <https://www.des.qld.gov.au/climateaction>

3. Rapid impact assessment framework

In the initial stages, information on the array of competing projects will be limited, but it is important to develop a framework to compare these opportunities, looking at the timing, type and value of identified costs and benefits.

DeltaPearl Partners has developed a Rapid Preliminary Economic Impact Assessment model to help consider various options. We have proposed employing input-output (IO) multipliers for rapid preliminary economic impact assessment. We have developed Mount Isa SA2, Queensland and Australia IO multipliers for this impact assessment. The data sources used to estimate the regional input-output tables are ABS (2021 Census of Population, Australian input-output tables, regional employment, Agricultural Census, Australian Industry, Merchandise Trade), ABARES (Agricultural Exports and Production), and the Australian Department of Industry, Science and Resources (resource production by state and prices). Using the regional IO tables, DeltaPearl Partners estimated regional IO multipliers. Using IO multipliers with an indicative resource investment profile of each project, we can estimate the direct and indirect contributions of the resource project impacts on Mount Isa SA2. Generally, four types of multipliers are used to assess the impacts on different measurable indicators:¹

- Output: measures the contribution to the production of all economic sectors.
- Income: measures the effect on the wages and salaries paid to workers within the economy.
- Employment: measures the jobs creation contribution and
- Value-added: measures the contribution of wages and salaries, profits, and indirect taxes.

IO multipliers are a flexible tool for economic analysis. Their flexibility stems from the different forms of each multiplier type – initial effects, first-round effects, industrial support effects, production-induced effects, consumption-induced effects, simple multipliers, and total multipliers. The sum of wages and salaries, profits and indirect taxes for a given industry provides a measure of its contribution to the size of the local economy – its contribution to gross regional product (GRP). Therefore, the value-added multiplier can also be considered the GRP multiplier.

When additional demand is created due to new investments, such as increased exports, production increases to meet the demand, which is the initial effect. Since production increases to match the increased final export demand exactly, the increase always equals one (noting that the multipliers are defined as a one dollar increase in final demand).

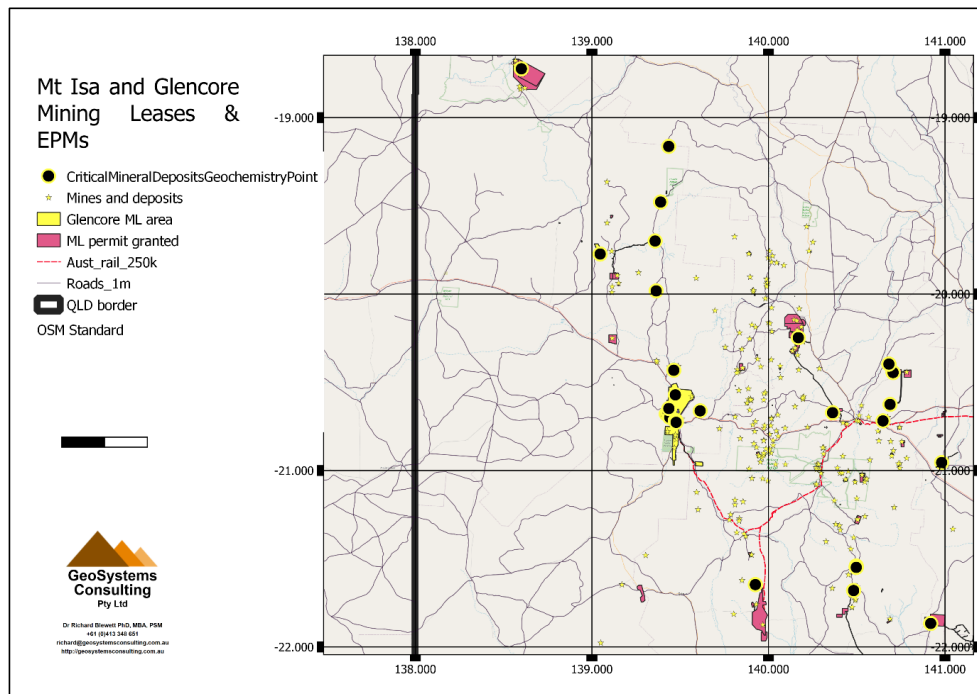
The industry producing the additional output makes purchases to increase production; production increases in other industries meet these new purchases, which constitute the first-round effect. These first-round production increases cause other industries to increase their purchases, and these purchases cause other industries to increase their production. These 'flow-on' effects eventually diminish but, when 'added together, constitute the industrial support effect. The industrial support effect added to the first-round effect is the production-induced effect. So far, this chain of events has ignored one important factor: the impact on labour and household consumption. When output increases, employment increases and increased employment translates to increased earnings and consumption by workers, which translates to increased output to meet the increased consumption. This is the consumption effect. The simple multiplier is the sum of the initial and production-induced effects. The total multiplier is more significant because it adds to the consumption effect. The Simple multipliers are used to calculate the lower estimates, and the total multipliers are used to calculate the upper estimates of the contribution of the resource sector projects to the Mount Isa economy.

4. Options for critical minerals and tailings

The Mount Isa region has a very active mineral exploration ecosystem, so the potential for new discovery is quite good, although any success will be too late for driving job generation in the near term. However, there are opportunities to develop critical minerals in the tailing dams and mullock dumps and there are active research programmes on this topic by government and universities.

Geoscience Australia is working with the United States Geological Survey and Geological Survey of Canada on a Critical Minerals Mapping Initiative.¹⁷ They have just released a full element suite of high-precision geochemistry, including from the Northwest Minerals Province (Fig. 2). Analysis of these new data may reveal hitherto unrealised opportunities for the region, at least over the longer term.

Figure 7: Map of latest geochemical analyses of ores across the Northwest Minerals Province.

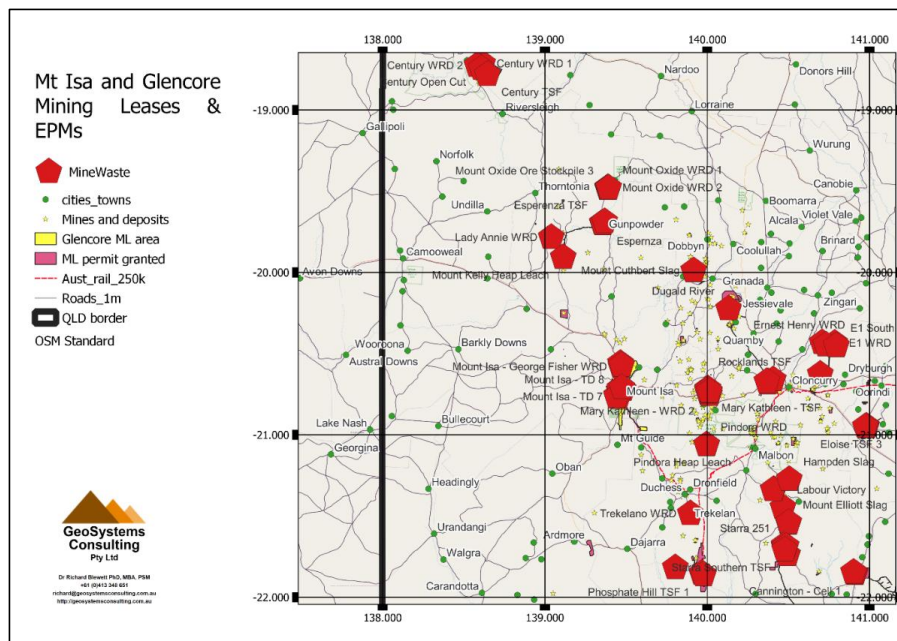


Source: Geoscience Australia

At least 63 mine tailings dams have been mapped, and their main resources defined by Geoscience Australia as part of their Critical Minerals Atlas (portal).¹⁸ These are displayed in the figure below. The granted Mining Leases (MLs) in the figure are obscured by the Mine Waste symbols, which shows that most MLs have waste on them.

¹⁷ <https://portal.ga.gov.au/restore/9cc2b170-2b51-4375-b5a5-31465359acc2>
¹⁸ <https://portal.ga.gov.au/restore/42745f84-70bb-4d42-a652-e212c2c56ffe>

Figure 8: Mine waste sites (tailings dams and mullock heaps) across the North West Minerals Province.



Source: Geoscience Australia

The mine wastes contain a wide suite of elements including gold, copper, lead, zinc, silver, cobalt, antimony, rare earths, uranium, iron, cadmium, phosphates, and magnesium.

There are many active research projects being conducted into harvesting critical minerals from mine tailings, including by the Sustainable Minerals Institute (UQ), Geological Survey of Queensland, RMIT and Geoscience Australia. A number of mine sites have been sampled and their content analysed for grade, quantity and metallurgy. This is ongoing work, and is reviewed in the report provided to Mount Isa City Council, *Critical Minerals and Tailings in Mount Isa and North West Minerals Province - Options*.

Development of these resources would involve some of the skills that the underground miners have, although these mine waste developments are likely to involve a highly mechanised operation with relatively few personnel required.

5. Mapping state and federal funding and financing programs

Per our separate reporting, the Queensland and Australian governments have committed unprecedented policy emphasis and some funding to the exploration, extraction and value-adding of critical minerals to support the clean energy transition and development of onshore advanced manufacturing and sovereign capability.

The Queensland Jobs Fund and the proposed Made In Australia Act by the Australian Government seek to consolidate and make more accessible those programs managed by multiple agencies. These programs have been designed to attract new investment. (The Australian Government has yet to provide the details for the Made In Australia Act.)

The Australian Government Budget was recently released on 14 May, and the Queensland Government Budget is due on 11 June. Elections are due within the next 12 months; Queensland election on 26 October 2024 and Australian election by mid-May 2025.

Based on the timeframes of the Glencore closure decision, Budgets and elections, recommended actions are to:

- Seek an update on the Queensland Government \$50 million support package and the REFF program
- Seek an update on the Queensland and Australian governments' priorities for Mount Isa and North West resource and other projects in their budgets
- Influence the Australian Government's Made In Australia Act to support proposals to replace Glencore's MIM underground copper and copper concentrator
- Approach Liberal and National State and Federal Oppositions to also prioritise Mount Isa and North West Queensland in their budget replies and election commitments.

6. Technical assessment of mine viability and prospects

A technical analysis of mine viability and prioritization for the Mount Isa region has been undertaken and submitted to Mount Isa City Council. The report found the following.

The Mount Isa region is mineral rich in a wide range of base and precious metals. A simple zipf (power) law analysis of the size of copper deposits in the Mount Isa region suggests that there is more metal to find and that the area is unlikely to be exhausted of its potential.

Infrastructure is quite well developed and copper-related mining is occurring at 10 mines (with George Fisher being more a lead-zinc (Pb-Zn) mine). There are more than 250 mining leases in the region, which means much of the permitting would be in place should a deposit located within an existing mining lease be deemed economically viable for further development.

Most currently active copper mines have tonnages exceeding 50 million tonnes (Mt) and grades greater than 0.5% copper. These mines commonly have additional metals, such as lead, zinc, silver, cobalt and gold. A series of economic models were run to test the net present value (NPV) of copper at increasing grades. Small deposits of around 20 Mt would need grades of copper greater than 1% just to break even. Adding gold at increasing grades improves the economics; however, these small deposits are likely to remain unmined.

The largest undeveloped deposit is the Swan-Mt Elliott copper deposit. It is low grade (0.6%) but enormous at 354 million tonnes, and it also contains low-grade gold at 0.3-0.4 g/t. Economic modelling of a deposit with these characteristics would generate more than \$5 billion in net present value. The fact that Swan is still not being mined should be further examined. The company discusses various infrastructure improvements such as road, power, water and communications that could be considered by government(s) in supporting a project like this. Of all the possible undeveloped mines in the region, this one has the most upside potential.

More detailed and site-specific asset analysis has been conducted in some cases. An audit of these and an analysis of common reasons why these deposits remain unmined could be conducted.

In terms of common infrastructure that is provided by the three levels of government, there are a number of options that could be considered to maintain a pipeline of mining jobs in the region. These options include:

- State and local government could examine the region's infrastructure and assess whether road improvements, including sealing, extending the North West Power Grid to the south, and

installing mobile phone towers to improve communications would provide additional incentives for proponents and lift the quality of life for locals.

- The Queensland Government has an exploration incentive scheme, the Collaborative Exploration Initiative, which largely focuses on greenfields areas and critical commodities (although copper and cobalt are of this class). The scheme could be expanded to include near mine exploration, where the scientific case is excellent. Alternatively, a new scheme could be offered (using an adaption of the existing greenfields scheme) where near mine copper-related exploration is encouraged and supported to ensure mine life for the existing mines is extended to mitigate the Mount Isa situation for the currently employed miners.
- Similarly, the Australian Government could adapt its *Junior Minerals Exploration Incentive*, which encourages investment by offering a refundable tax offset to shareholders of junior companies exploring in greenfields areas, by allowing brownfields exploration in this region to be considered.
- Some companies note that heritage (colonial and indigenous) assets are costly and time consuming to address. It is likely that these heritage issues would be common to any project. Governments at local, state and federal level could collaborate and potentially undertake 'pre-competitive' heritage studies in support of resource projects.

7. NWMP Studies and Early Works Fund

DeltaPearl Partners recommends the establishment of the North West Minerals Province "Studies and Early Works Fund" (SEW) to be managed from Mount Isa funded by the Australian Government.

After the exploration phase has been conducted and mineralisation has been discovered, further expenditure must be incurred in scoping and feasibility studies as well as preliminary early works to determine whether the mineral reserves are extractable at a profit. As such, investment at this phase of the mining process comes with significant risk of loss and exploration companies often lack the capital to continually invest in these undertakings. Due to the cyclical nature of the commodity prices and the forecasted escalation of operating costs for the industry there will be challenges for mining companies to access sufficient financing for new projects.

The proposed objective of the SEW Fund is to progress projects where uncertainty is a major roadblock in investment. Funding could be offered on a 50-50 basis using a one-step application process, with government funding occurring after the first 50% has been expended by proponents. Only projects in the North West Minerals Province may be eligible. A SEW Fund might have a value of \$100m – \$200m.

The SEW Fund could provide grants for projects to undertake scoping, sampling, feasibility studies and early works would allow companies to jump a key hurdle and move from exploration to operation. This is a particular challenge in the remote North West Minerals Province where proponents report high levels of risk associated with high price and uncertain access to water, power and rail.

Furthermore, a SEW Fund de-risks critical minerals projects for miners and investors without overburdening the Government with operations, construction, rehabilitation, and decommissioning costs.

A NWMP SEW Fund, centred around Mount Isa, would enable miners to conduct feasibility, scoping, sampling, and early works on projects where costs of studies and risks of failure are high or unknown. Where interest in – and demand for – critical minerals production continues to grow, de-risking these projects will assist in driving them towards final investment decisions for mine development. While critical minerals projects in Northwest Queensland are not being developed due to the many identified risks, assistance to build experience and knowledge is central to the process of industry learning. The cost of developing effective and innovative techniques to successfully manage critical minerals projects may dissuade potential miners and leave critical resources unexplored.

Using a multi-phase approach, a NWMP SEW Fund could fund feasibility studies for successful applicants across multiple tranches of funding such as through:

- A challenge-based grant, where applicants would submit proposals for feasibility studies (including approvals) seeking to address key roadblocks to effective extraction of critical minerals in Mount Isa.
- A challenge-neutral competitive grant process where the most promising feasibility study proposals are funded with the goal of maximising expected critical mineral supply.

The SEW Fund would then advance two key opportunities in Mount Isa. Firstly, it would encourage progressing mining projects to the next phase of operation, generating value for Mount Isa and the region. Second, it would encourage the development of new technologies and techniques to effectively extract critical minerals, thus proving up critical mineral supply in Australia, building confidence in the sector, and potentially enabling the procurement and dissemination of successful innovation for the benefit of the resources sector in general. By advancing more projects towards development, it would also send a strong signal to businesses and community members that future opportunities are present in Mount Isa, assisting broader policy initiatives aimed at population and workforce retention.

8. Australian Critical Minerals Investment Database

DeltaPearl Partners recommends the establishment of the “Australian Critical Minerals Investment Database” (ACMID) in Mount Isa. A report provided to Mount Isa City Council on 2 May 2024 provides more detail.

ACMID would be a platform through which prospective users can access a relational database which integrates up-to-date data on critical minerals – location, depth, quality, quantity, and metallurgy – as well as their related value chain – processing, logistics, manufacture, export, prices and markets. These data would be paired with analytic and data visualisation tools. By providing a platform/portal with an intuitive user interface, ACMID would be used to enable effective communication and planning for critical mineral opportunities, risks, constraints, and options for public agencies and private enterprise. The primary objective of ACMID is to ease the pathways for investors, especially new foreign investors, who want to invest in potentially the world’s most concentrated critical and strategic minerals ecosystem.

ACMID would act as a tool for coordinating and communicating economic opportunities and infrastructural needs to miners, investors, governments, and service providers across the value chain. In a global economy where demand for critical minerals is forecasted to grow exorbitantly over the coming decades,¹⁹ new investment and technology across the value chain, closely linked with Australia’s strategic international partners, could produce compounding economic benefits.

Given the significant opportunity for Mount Isa to grow into a significant critical minerals producer and processor and the need to rapidly develop capacity to meet growing market demand, ACMID could spur sustainable growth throughout the global transition to a net-zero economy.

Furthermore, if ACMID were based and maintained within Mount Isa, it would provide new employment and training opportunities and otherwise help centre Mount Isa as an international critical mineral centre. For Mount Isa, the direct benefits for a platform are that it will assist in improving the value chain of resources in the region, provide different employment opportunities and improve economic resilience and adaptiveness of Mount Isa to the dynamic nature of the domestic and global resources markets²⁰. It is proposed that ACMID be operated by the Australian Government and jointly funded by the Australian and Queensland governments.

¹⁹ International Energy Agency, (2021), *The role of critical minerals in clean energy transitions*, [Online], Available at: <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions>

²⁰ World Trade Organisation, (2019), *Economic diversification: lessons from practice*, [Online], Available at: https://www.wto.org/english/res_e/booksp_e/aid4trade19_chap5_e.pdf

9. Global Critical Minerals Exchange

The objective of establishing an International Critical Minerals exchange in Mount Isa is to increase Australian and international understanding of markets and prices for critical minerals and rare earth elements, and to centralise Australia's and Mount Isa's place in the global market.

The International Critical Minerals Exchange (CMX) is envisioned as a particular type of commodity exchange – which acts as a centralised market for the trade of various classes and categories of raw material – ensuring that producers and consumers of metals have a reliable market to access when other options for procurement and sale are unavailable and to provide options to hedge against the risks of increasing price volatility during periods of economic uncertainty. The benefits of the CMX are outlined in the report Proposal for a Global Critical Minerals Exchange provided to Mount Isa City Council.

A NWMP CMX located in Mount Isa would act as a regional/national manager, regulator, and arbiter of the critical minerals market, employing futures trading to cover risk in markets vulnerable to supply-chain disruption and price instability. It would act as a central hub for resource extraction, processing, manufacturing, and/or technology firms as well as futures traders such that efficient prices can be obtained, contracts for resources can be negotiated, quality of goods can be standardised, provenance assured, and key market information can be disseminated. The development of a critical materials forward rate for suppliers to cover supply backlogs within firms can act to stabilise prices and insure against untimely market exits.

This opportunity also allows Mount Isa to leverage its mineral and resource potential into the development of a new, unique technology and digital opportunity. The CMX would be an Australian first, and with sufficient investment and interest, well-positioned to provide a range of additional services. For example, the LME has significant warehousing of minerals across the world to support the broader activities of trades and traders. Mount Isa would have the ability to also consider a CMX with sufficient local warehousing capacity which can be linked to the east coast through rail transit to Townsville.

10. Production of Sulphuric Acid

A key consequence of the 2030 closure of the copper smelter is the cessation of the production of sulphuric acid which is an absolutely critical input for Incitec Pivot's ammonia production and as a reagent for future critical minerals producers. Well before the October 2023 announcement by Glencore, the Queensland Government's Department of State Development commenced a study on the security of the sulphuric acid supply chain in Queensland. The Queensland Government was thus well placed to update this after the Glencore announcement. The results of this study were not available at the time of reporting. However, it is likely that the report will make the following points: 1. Sulphuric acid must be produced within Queensland and Townsville Port is not adequate to manage large-scale importation; 2. Costs must be kept competitive because it is such a key input for other industries; 3. The future of Phosphate Hill and Incitec Pivot will be in doubt without secure supply of acid; 4. All levels of government should look at funding, building and hosting new facilities to use pyrite and other waste and byproducts to produce sulphuric acid, ideally based on the maximum amount of renewable energy to minimise the acid's carbon intensity. There is a significant opportunity for Mount Isa to address this opportunity and challenge.

11. Australian Critical Minerals Hub in Mount Isa

As technological development continues to accelerate, the demand for critical minerals continues. As such, Federal and State Governments have recognised that with Australia's extensive mineral supply,

we are well placed to be a significant provider of critical minerals, including as a processor and value-add manufacturer.

In order to enhance the country’s critical minerals processing capabilities, develop processing and refining industries, and maximise the value of the mineral endowment there is an opportunity to establish critical minerals hubs in strategic locations, most especially in Mount Isa. The opportunity to establish hubs strongly aligns with the focus areas to achieve the Australian Government’s goals for the critical minerals sector as outlined in the Critical Minerals Strategy 2023-2030²¹. These hubs are intended to coalesce mineral access, key infrastructure, specialist capability and experience. This would drive efficiencies and attract investment at all stages of the value chain, delivering world-leading product, capability and delivery.

The development of a regional hub structure in Australia is not just related to a mining resource and location, it provides support to an end-to-end focus on the whole value chain from the mine to a processor to an end-user or manufacturer. It is assessed that the development of hubs will bring together multiple supply chain benefits and aspects to a functioning hub ecosystem, boosting Australia’s critical mineral supply profile.

Given that most of Australia’s critical minerals and materials activities will occur in regional and remote parts of the country, to optimally facilitate developing this industry is through the identification, design and development of a series of critical minerals hubs (CMH), but we assess that mineral, technology and infrastructure endowment of Mount Isa lends itself to being the first such CMH in Australia.

Fundamental requirements in developing a broader, working CMH ecosystem include:

- critical support from all levels of government;
- access to green sources of energy;
- establishment of critical minerals/materials supply agreements;
- access to a skilled workforce;
- support of existing and future trade with broader geopolitical alignment; and
- support of regional diversification and management of a transition effort, particularly in traditional resource centres such as historic coal mining and production areas.

CMHs could exist in different forms which are customised for comparative advantage and to support flexibility and growth over time. As such, the geographical boundaries of a hub do not have to be confined to one particular town/city. A hub may extend over an entire minerals province or region to a capture the relevant features which coalesce mineral access, key infrastructure, specialist capability and experience.

The Australian Government needs to lead on the formation of the CMH. This is mainly through the Department of Industry. But government involvement, from all levels, can be applied in support of CMH development to any or all of the key six hub development features. Primary opportunities relate to further investigation in how to develop common user infrastructure, related to logistics, minerals processing, as well as research and development and direct support to hub proponents to establish themselves or progress development.

Hub feature	Potential government support roles
Logistics	Fast-tracking transport infrastructure projects through studies, funding, and development.

²¹ Australian Government, (2023), *Critical Minerals Strategy 2023-2030*, [Online], Available at: <https://www.industry.gov.au/publications/critical-minerals-strategy-2023-2030>

Concentration	Funding and financing of new common user, independently owned and controlled concentrator(s)
Primary Processing	Providing support for common-user minerals concentration, processing and refining infrastructure studies and their associated funding and future development.
Refining	Funding and financing of new common user, independently owned and controlled refining plant and support for international market access
Research, Development, Manufacturing and Workforce Training	Strengthening research and development agencies, and tertiary and non-government institutions' connection to prospective hub locations through cooperative research, and potential centralised intellectual property sharing arrangements.
Market Facilitation Support	Offering bespoke guidance for potential hub proponents through regulation and approvals processes and connections to key infrastructure, while also introducing participants to a network of partners, suppliers and allied organisations to assist with establishment and operations. Opportunity to undertake region wide environmental assessments and approvals to fast-track proponents entering the hub.

12. Stakeholder Consultations

A stakeholder register is provided below.

Company Name	Contact person	Position	E mail address	Phone contact	Location
Queensland Resources Council	Andrew Barger	Governance and Policies	andrewb@qrc.org.au	0417 403 822	
MITEZ	Maria James	CEO	ceo@mitez.com.au	0499 492 094	Townsville
29 Metals	David Cameron	Project Manager	david.cameron@29metals.com	0421 421 887	Brisbane
Chinover	Richard Webb	CEO	Richard.Webb@ChinoverResources.com	0427 509 129	Brisbane
Glencore	Maryann Wipaki	GM Health, Safety, Enviro	Maryann.Wipaki@glencore.com.au	0419 736 685	Mount Isa
Evolution	Aaron Harrison			0466 777 695	Cloncurry
North West Phosphate	John Cotter	Managing Director	jcotter@nwphos.com	0427 971 577	Brisbane
Incitec Pivot	Scott Bowman	Interim President		0419 756 576	Melbourne
True North	Peter Brown	CEO	peter.brown@truenorthcopper.com.au	0409 638 929	Cairns
Harmony	Glenn Connell	Executive General Manager	Glen.Connell@harmonyseasia.com	0458 505 684	Brisbane
Centrex	Robert Mencil	CEO		08 8213 3100	Adelaide
Copper Resources Australia (Mount Cuthbert Group)	Steward Robinson	CEO		08 8118 6050	Adelaide

31

South 32	Graham Kerr	CEO		08 9324 9000	Perth
Austral Resources	Shane OConnell	COO		07 3520 2500	Brisbane
Wonarah Phosphate (Avinira)	Brett Clark	CEO		08 9264 7000	Perth
Eliose (AIC Mines)	Aaron Colleran	CEO		(08) 6269 0110	Perth
Tombola	Byron Miles	MD		0413 058 592	Cloncurry
Carnaby Resources	Rob Watkins	MD		08 6500 3236	Perth
Mount Isa Minerals	David Williams	Executive Chair	David@mountisaminerals.com.au	0419 779 250	Brisbane
Round Oak	Ian Shaeppard	COO		7 3034 6200	Brisbane
MMG (Dugald River)	Nan Wang	GM		7 4442 0630	Brisbane
Sun Metals	DK Choi	Operations manager		7 4726 6600	Brisbane
AMEC	Kirsten Pietzner		kirsten.pietzner@amec.org.au	0455 743 329	
Government Contact	Contact person	Position	E mail address	Phone contact	Location
DSDILGP	Tammy Parry	Regional Director	Tammy.Parry@dsdilgp.qld.gov.au	0428 105 371	Mount Isa
Port of Townsville	Drew Penny	General Manager	DPenny@townsville-port.com.au		Townsville
Department of Resources			https://www.resources.qld.gov.au/contact-us	137468	Mount Isa

13. Addenda

- In the recent 2024-25 state budget, the Queensland Government amended payroll tax provisions, effectively raising an additional \$20m per annum payroll tax from Glencore.
- The federal Opposition has announced its intention, if it wins the next federal election, to build seven nuclear power stations across the country. Mount Isa was not listed as one of these seven locations. However, the advent of transmission line connection to Mount Isa could shift that equation, and there will also be a need to build nuclear waste disposal facilities in Australia, a task for which Mount Isa may be well suited. Further, Mount Isa has Australia's largest uranium deposits, demand for which will naturally grow if nuclear power plants are to be built.
- It is possible that third-party use of the Glencore copper smelter, or some nearby replacement smelter, may grow in coming years. This will mean more heavy trucks on the roads and so this will increase the rationale for an appropriately located heavy vehicle bypass.
- In the near-term, Glencore cooperation and financial support will be essential for various things such as effective land tenure planning of the proposed Transport and Logistics Centre, or the possible relocation of the golf course. Similarly, Council will have various town planning responsibilities to execute in support of Glencore operations.

14. Conclusions and next steps

To achieve diversification and optimisation, it will be important for Mount Isa to stay focused on its comparative advantages related to its location and resources, as well as worldwide trends in terms of growth industries. It is evident that critical minerals should be a key focus of the resources pillar of the economic base for these reasons. Mount Isa and NWMP has much potential to produce more copper, a key commodity global for the new economy transition.

The focus of this report is the resources sector and identification of early projects that are both high impact and actionable to support Council and the Queensland Government's immediate and near-term response.

Focusing on the resources sector, this report proposes pathways to realise investment and accelerate resource development to facilitate Mount Isa's shift to a new economy. It forms Phase 1 of the project, with Phase 2 to follow. Phase 1: Ideas Generation, is focused on generating ideas and short-term actions relevant to the resources sector to prevent population loss and to support the Mount Isa economy and community.

A large number of competing ideas seeking capital, whether private finance, government funding, or both, have arisen in response to the Glencore closure and the government's support package. This report has provided an initial list of potential projects for the Mount Isa region for Council's consideration, ranging from a new copper mine, a minerals processing facility, and a rail connection to North Queensland through to tyre recycling and critical minerals opportunities in the surrounding the NWMP. Given the plethora of potential projects within the resources sector, a Rapid Preliminary Economic Impact Assessment framework has been developed by DeltaPearl Partners based on input-output analysis, which will enable the comparison of these opportunities, examining timing, type and value of identified costs and benefits. As well as assessing competing resources sector projects, the framework will aid in synthesising and comparing competing projects across all six economic pillars.

The technical analysis of the region provided to Council highlights and recommends further analysis of potential for the region's wide range of base and precious metals, in particular, of the Swan-Mt Elliott copper deposit which, of all the possible undeveloped mines in the region, has the most upside potential. It also suggests common infrastructure investments, incentives for near-mine explorations, and 'pre- competitive' heritage studies to support resource projects to maintain a pipeline of mining jobs in the region.

This phase of the project, Phase 1: Ideas Generation, has focused on generating ideas and short-term actions to prevent population loss and to support the Mount Isa economy and community. It has been proposed that initial investments focus on near-term opportunities to prevent population loss and economic decline, as well as contributing to ongoing structural transformation.

In summary, the recommendations for the resources sector are:

- *Exploration of options for critical minerals and tailings:* There are opportunities to develop critical minerals in the mines' tailing dams and mullock dumps. Geoscience maintains a Critical Minerals Atlas²² and has mapped and defined the resources of at least 63 mine tailings dams in the region. Council should monitor and utilise the active research programmes on this topic by government and universities.
- *Mapping of funding and financing programs:* Council should map state and federal funding and financing programs relevant to Mount Isa, and lobby for both levels of government for support and potentially replacement of Glencore's Mount Isa underground copper mine and copper concentrator through the newly proposed Made in Australia Act.

²² <https://portal.ga.gov.au/restore/42745f84-70bb-4d42-a652-e212c2c56ffe>

- *Establishing a NWMP “Studies and Early Works Fund”* to progress mining projects through high-risk and uncertain phases to operation, signalling opportunities in Mount Isa, and encouraging the development of new technologies and techniques to extract critical minerals.
- *Founding an Australian-first “Critical Minerals Regional Hub”* in Mount Isa as the first critical minerals hub in a planned regional network. Mount Isa’s mineral, technology and infrastructure endowments mean it is ideally placed to become the first of a series of critical minerals regional hubs, which would drive efficiencies across the full value chain of critical minerals.
- *Forming an Australian Critical Minerals Investment Database* centred on Mount Isa would ease pathways for potential investors to invest in critical minerals, as well as providing new employment and training opportunities.
- *Establishing a Global Critical Minerals Exchange* in Mount Isa to increase understanding of markets and prices for critical minerals and rare earth elements would centralise Australia’s and Mount Isa’s place in the global market.

In Phase 2, the Execution Phase, Council will focus on execution of the high priority projects identified in Phase 1. It will also be important for Council to synthesize the ideas across the six pillars identified to ensure that funds are allocated optimally.

Investment in the other pillars being considered separately will also be crucial. Other “industries of the future” are likely to include advanced agriculture, food production and processing, technology, energy, renewables, manufacturing, and resource recovery. Investment in critical infrastructure will also be essential, including to support connectivity to markets, and of renewable energy to grids, but also to maintain and enhance Mount Isa as a vibrant urban centre, and prevent population outflow.

Economic diversification will also require promoting the development of alternative industries and economic activities, and also reskilling and retraining workers, working with TAFEs, VET and other education providers to help train workers in related and emerging industries.

The overall project includes two phases. The advice in this report forms part of Phase 1 of the project, the Ideas Generation phase, described by Mount Isa City Council as follows:

Phase 1 will involve economic and environmental scans and ideas generation to strategise the overall transition of Mount Isa’s economy, in partnership with the Mount Isa Copper Mine Closure Taskforce.

The Phase 1 consulting services will involve identifying pathways and early projects to realise investment in each of the six (6) identified critical areas of economic opportunity. The early projects identified are required to be both high impact and actionable, and to support Council and the Queensland State Government’s immediate and near term response. The services will support the acceleration of diversification and transformation of Mount Isa’s economy.

Phase 2, the Execution Phase, intended to proceed in future. Phase 2 planned for the period June 2024 to July 2025 is focused on execution of high priority projects identified in Phase 1.

Appendix A: Mount Isa/Global critical mineral endowment lists

The table below provides a comparison of the critical minerals endowments of the Mount Isa Region including the North West Minerals Province compared with the international lists.

Many of the critical and strategic minerals on the international lists are present in the Mount Isa region and the wider North West Minerals Province.

The table below provides a comparison of the minerals included on international lists for the US, EU, UK, India, Japan and Korea, as well as Australia, and the minerals presents in the Mount Isa region, including the NWMP.

Table 1: Comparison of international “critical mineral lists” and critical minerals in the Mount Isa region

Critical Mineral	On Australia list	On US list	On EU list	On Japan list	On India list	On Korea list	On UK list	Present in Mount Isa / NWMP region
High-Purity Alumina	✓	✓	✓	×	×	×	×	
Antimony	✓	✓	✓	✓	×	✓	✓	✓
					(removed 2023)			
Arsenic	✓ (new additional 2023)	✓	✓	×	×	×	×	
Beryllium	✓	✓	✓	✓	×	×	×	
					(removed 2023)			
Bismuth	✓	✓	✓	✓	×	✓	✓	
					(removed 2023)			
Chromium	✓	✓	×	✓	✓	✓ (Chrome)	×	
Cobalt	✓	✓	✓	✓	✓	✓	✓	✓
Fluorine	✓ (new 2023)	✓	✓	✓	×	×	×	
Gallium	✓	✓	✓	✓	✓	✓	✓	✓
Germanium	✓	✓	✓	✓	✓	✓	×	
Graphite	✓	✓	✓	✓	✓	✓	✓	✓
Hafnium	✓	✓	✓	✓	×	✓	×	

Critical Mineral	On Australia list	On US list	On EU list	On Japan list	On India list	On Korea list	On UK list	Present in Mount Isa / NWMP region
Helium	x (removed 2023)	x	✓ (added 2023 after being removed 2020)	x	x	x	x	
Indium	✓	✓	x (removed 2023)	✓	✓	✓	✓	
Lithium	✓	✓	✓ (added 2020)	✓	✓	✓	✓	
Magnesium	✓	✓	✓	✓	x	✓	✓	✓
Manganese	✓	✓	✓	✓	✓ (Added 2023)	✓	x (On UK "Watchlist")	
Molybdenum	✓ (Added 2023)	x	x	✓	✓	✓	x	✓
Niobium	✓	✓	✓	✓	✓	✓	✓	
Platinum-group elements	✓	✓	✓	✓	x (removed 2023)	✓	✓	
Rare-earth elements	✓	✓	✓ EU splits REEs into heavy and light (HREES and LREES)	✓	✓	✓	✓	✓
Rhenium	✓	x	x	✓	x	✓	x	✓

Critical Mineral	On Australia list	On US list	On EU list	On Japan list	On India list	On Korea list	On UK list	Present in Mount Isa / NWMP region
					(removed 2023)			
Scandium	✓	✓	✓	×	×	×	×	
Silicon	✓	×	✓	✓ (Silicon metal)	✓	✓	✓	✓
Tantalum	✓	✓	✓	✓	×	✓	✓	
					(removed 2023)			
Tellurium	✓ (newly added 2023)	✓	×	✓	×	×	✓	
					(removed 2023)			
Titanium	✓	✓	✓	✓	✓ (new 2023)	✓	×	
Tungsten	✓	✓	✓	✓	×	✓	✓	
Vanadium	✓	✓	✓	✓	✓	✓	✓	✓
Zirconium	✓	✓	×	✓	×	✓	×	
					(removed 2023)			
Barite /Baryte /Barium	×	✓	✓	✓	✓	✓	×	
Bauxite	×	×	×	×	✓	×	×	
			(merged with aluminium 2023)					
Borates / Boron	×	×	✓	✓	×	✓	×	

Critical Mineral	On Australia list	On US list	On EU list	On Japan list	On India list	On Korea list	On UK list	Present in Mount Isa / NWMP region
					(removed 2023)			
Cadmium		x	x	x	x (removed 2023)	✓	x	✓
Carbon	x	x	x	✓	x	x	x	
Cerium	x	✓	x			x	x	
Cesium	x	✓	x	✓	x	✓	x	
Coking coal	x	x	✓	x	x	x	x	
Copper	x (on "Strategic Minerals List")	x	x	x	✓ (added 2023)	x	x	✓
Diamond	x	x	x	✓	x	x	x	
Dysprosium	x	✓	x	x	x	x	x	
Erbium	x	✓	x	x	x	x	x	
Europium	x	✓	x	x	x	x	x	
Feldspar	x	x	✓	x	x	x	x	
Fluorite	x	x	x	✓	x	x	x	
Fluorspar	x	✓	✓	x	x	x	x	
Gadolinium	x	✓	x	x	x	x	x	
Gold	x	x	x	✓	x	x	x	✓
Holmium	x	✓	x	x	x	x	x	
Iron	x	x	x	x	✓	x	x	✓
Iridium	x	✓	x	x	x	x	x	

Critical Mineral	On Australia list	On US list	On EU list	On Japan list	On India list	On Korea list	On UK list	Present in Mount Isa / NWMP region
							(On UK Watchlist)	
Lanthanum	x	✓	x	x	x	x	x	
Lead	x	x	x	✓	✓	x	x	✓
Limestone	x	x	x	x	✓	x	x	
Lutetium	x	✓	x	x	x	x	x	
Natural rubber	x	x	✓	x	x	x	x	
Neodymium	x	✓	x	x	✓ (added 2023)	x	x	
Nickel	x (on Strategic Minerals List)	✓	x	✓	✓ (added 2023)	✓	x (On UK Watchlist)	
Palladium	x	✓	x	x	x	x	x	
Phosphates	x	x	✓ (Phosphate rock)	x	✓	x	x (On UK Watchlist)	☐
Phosphorus	x (on Strategic Minerals List)	x	✓	✓	x	✓	x	
Potash	x	x	x	x	✓	x	x	
Praseodymium	x	✓	x	x	x	x	x	
Rhodium	x	✓	x	x	x	x	x	
Rubidium	x	✓	x	✓	x	x	x	
Ruthenium	x	✓	x	x	x	x	x	

Critical Mineral	On Australia list	On US list	On EU list	On Japan list	On India list	On Korea list	On UK list	Present in Mount Isa / NWMP region
							(On UK Watchlist)	
Samarium	x	✓	x	x	x	x	x	
Scandium	x	✓	x	x	x	x	x	
Selenium	x	x	x	✓	x	✓	x	
Silver	x	x	x	✓	✓	x	x	✓
Strontium	x	x	✓	✓	✓	✓	x	
Terbium	x	✓	x	x	x	x	x	
Thalium	x	x	x	x	x	✓	x	
Thorium	x	x	x	✓	x	x	x	
Thulium	x	✓	x	x	x	✓	x	
Tin	x (on Strategic Minerals List)	✓	x	x	✓	✓	✓	
Ytterbium	x	✓	x	x	x	x	x	
Yttrium	x	✓	x	x	x	x	x	✓
Zinc	x (On Strategic Minerals List)	✓	x	✓	✓ (added 2023)	x	x	✓
Total on list	30 (5 additions in 2023)	50	34	32	14 critical; more high supply risk	35	18	

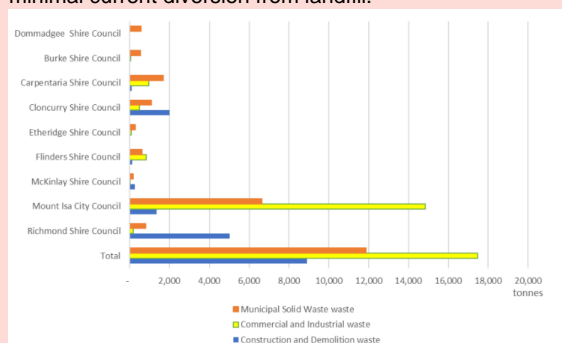
Appendix B: Projects / details

NWQROC - Waste management policies

NWQROC - North West Queensland Regional Waste Management Plan

In 2023, NWQROC released a North West Queensland regional waste management plan to contribute to meeting the Queensland Government’s ambitious waste management targets by 2050 to • reduce household waste by 25%; • achieve 75% recovery across all waste streams; and • recover 90% of all waste (i.e., 90% not landfilled).

Managing waste in the region is immensely challenging, given the small population spread over a wide region - there are 31,000 people in 22 discrete communities in an area of 350,000 km² (20% of the Queensland landmass). The key issues identified for the region include depleting landfill capacity, litter and illegal dumping, especially abandoned vehicles and other items, accumulated legacy waste at landfills (especially tyres, concrete, scrap metal white goods, and vegetation), lack of regional processing capacity, lack of reliable data to inform business case development, and minimal current diversion from landfill.



Waste streams generated by the councils in 2021 are illustrated in the graph; Mount Isa is one of the most populous LGAs with considerable contributions to waste streams. Of the 43,870 tonnes of waste generated, 38,000 tonnes was sent to landfill.

The strategy incorporates a Material Recovery Facility (MRF) in Mount Isa; the Council has approved the establishment of an MRF to support the introduction of a kerbside recycling

service to its residents, and potentially neighbouring Cloncurry SC, at an indicative cost of \$13 million for site infrastructure plus an additional \$1 million for household bins and an education campaign. A key initiative of the NWQROC Plan is to reduce the landfills to 9, build 15 new transfer stations, and upgrade all sites.

* Apart from Mount Isa, the other 9 councils of NWQROC are Burke SC, Carpentaria SC, Cloncurry SC, Croydon SC, Doomadgee ASC, Etheridge SC, Flinders SC, McKinlay SC, and Richmond SC.

Eva Copper Mine

Item	Date required	Capital cost / value
11km access road and Burke Developmental Road intersection	ASAP	\$20 million
Accommodation village	Prior to construction	\$85 million
Onsite 50MW power generation (diesel+solar+battery)	Start of production	\$250 million

Onsite 250 MW solar power (for shared-use, surplus power exported to the grid)	Start of production	~\$450 million (plus \$100 million high-voltage power line as detailed below)
75 km high-voltage power line	Start of production (if connecting to grid to start or exporting surplus power) or when CopperString 2032 comes online	\$100 million
5 year royalty holiday	From first production	\$130 million
SunWater infrastructure upgrade (if required)	Start of production	\$15 million
SunWater pipeline diversion (if required)	Start of production	\$40 million

Mount Isa Technology Metals Hub (SMI)

The Sustainable Minerals Institute / UQ has proposed a technology metals hub for Mt Isa. Their proposal suggest that:

- available parts of the extensive Mount Isa mining and processing infrastructure are given over to the production of a variety of metals and concentrates derived from the extensive array of primary and secondary deposits of critical and strategic elements such as copper, cobalt, REE, gallium, and others.
- the city is the site of a world class facility for characterisation, testing, small to large scale piloting and production of critical metals providing employment to a large local workforce. As the critical minerals economy develops in Australia, Mount Isa becomes a key hub for metallurgical testing, piloting, and treatment in which projects from Australia and the broader region send their samples and ores to Mount Isa for characterisation and treatment.
- Mount Isa becomes a site at which small modular processing equipment is manufactured and sent around the world to treat critical mineral deposits.
- Mount Isa becomes known worldwide as a centre for high quality practical learning and skill development and research in the treatment and extraction of critical metals that attracts a future workforce and researchers from around the globe to utilise the facilities and capabilities in the city.
- that technological solutions have been developed to unlock some of the clear opportunities that exist in the minerals area for the region including:
 - A successful flowsheet and facility for the production of acid, cobalt, copper and other valuable metals from the extensive Mount Isa tailings deposits;
 - That the city becomes a site for testing and treatment of Mount Isa primary ores for extraction of other accessory metals such as gallium;
 - A closer synergy between phosphate production and other mining operations, allowing a deeper integration of complementary processing and extraction schemes as well as pathways for extraction of a broader range of economically significant byproducts from phosphate ores;
 - A complex that includes a range of small to medium-scale processing facilities for the variety of REE and other critical mineral deposits in the region that includes small

modular processing, innovative hydrometallurgy and pyrometallurgy, as well as potentially biomining, phytomining and agrimining;

- A strategy to identify, prioritise and plan the production of metals from the array of smaller deposits, as well as the potential from mine waste and Tailings, in the Mount Isa region that together add up to a large resource of copper and other metals, identifying efficient pathways for sharing of infrastructure and project development plans between projects and project owners for an optimised regional production plan.

The proposed steps to realisation of the vision are as follows:

1. Idea capture (3-6 months). Mount Isa was a centre of world class mining value chain innovation in the latter part of the 20st century and the people and expertise developed during that period and later have spread across the world mining industry. Queensland and Australia remain the world leaders in mining value chain innovation. All this means that there is an enormous storehouse of technical expertise with direct knowledge of the Mount Isa region. An important first step could therefore be to develop a program to canvas and capture ideas about the potential opportunities for the next phase of the Mount Isa mineral economy, and how to return Mount Isa to the leadership role it held for many years. The outcome of this process would be an assessment report that identifies and describes opportunities arising from the idea capture process.
2. Develop business cases (3-6 months). At this stage, and after an initial prioritisation process, the idea would be to develop high level business cases for the opportunities identified, resulting in a report with clearly identified criteria for assessment of opportunities and a prioritised list with developed business cases.
3. Initial scoping of high priority opportunities (6 months). At this stage, the highest priority opportunities identified at the initial stage would be subject to a more rigorous scoping level assessment, taking the ideas to a level where they could be presented to bodies that may be able to fund more detailed pre-feasibility studies. The outcome of this stage would be a prioritised portfolio of an agreed number of potentially feasible projects with associated high level financials and an estimate of the cost of further risk reduction studies.

Queensland Policy Platform (AMEC)

AMEC has proposed a “Queensland Policy Platform” to:

- Increase economic growth through increased mineral exploration and mining activity
- Reduce the cost of doing business throughout the State, and
- Ensure Queensland is a partner of choice for sourcing and investing in responsibly sourced minerals for the future.

AMEC considers that the current approach to the resources sector in Queensland is “generating an environment that will not attract strong investment in mineral exploration or support a modern Queensland economy with a diverse resources sector.” To address this, they identify reforms in the following priority areas:

- land access and co-existence
- reducing red tape
- environmental regulation
- whole of government alignment
- safety

More detail is available in the full report: AMEC (May 2024), Queensland Policy Platform.

Green advanced minerals processing facility in Mount Isa

VISIR has proposed the development of a green advanced minerals processing facility in Mount Isa and the NWMP.

Key details and benefits are outlined below.

- Development of green advanced minerals processing facility and associated infrastructure in Mount Isa and the North West Minerals Province (**NWMP**) – a project focused on maximising critical mineral extraction and economic development in the region.
- » Australia is set to have no open access smelter by 2030 leaving our minerals processing industry beholden to China and India
- » The project aims to drive short-term and long-term economic activation through creation of a green multi-user minerals processing facility, dramatically boosting the region's ESG credentials and Net Zero positioning
- » Significant development expenditure is required with intended commercial operations timed to align with the planned ceasing of Glencore's processing operations in Mount Isa. The ultimate construction costs for the facility estimated at \$800 million to \$1.2 billion
- » VISIR's strategy is based on unrivalled understanding of Mount Isa mining and minerals processing and energy supply in the North West Power System:
 - VISIR was the founder and developer of CopperString 2032 (sold to Queensland Government in March 2023)
 - Team lead, Matt O'Neill, was the Regional Lead for Glencore's Copper and Zinc operations (Australia) and Managing Director for Mount Isa Mines, including Lady Loretta, Ernest Henry, CSA and McArthur River, Port Operations (NT), and the Townsville Copper Refineries and Port Operations
- » Creation of a new business model industry wide – the facility will offer smelting infrastructure as a service, including tailings reprocessing and cobalt / acid development
- » Reduces the barriers for new mining operations to start and improves mining business case for miners in NWMP (and other places in Queensland)
- » Creates continuity of processing infrastructure across the Townsville-Mt Isa corridor for critical minerals Continued employment post 2030 of:
 - 300+ people in the Mt Isa region
 - 250+ people in the Townsville region through the Copper Refinery and IPL's Acid Plant and Phosphate Hill operations

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Significant skilled job creation and an increase in the real income of residents in greater Mount Isa region leading to increased demand for labour and goods and services.

300+ jobs in the Mt Isa region and 250+ jobs in the Townsville region



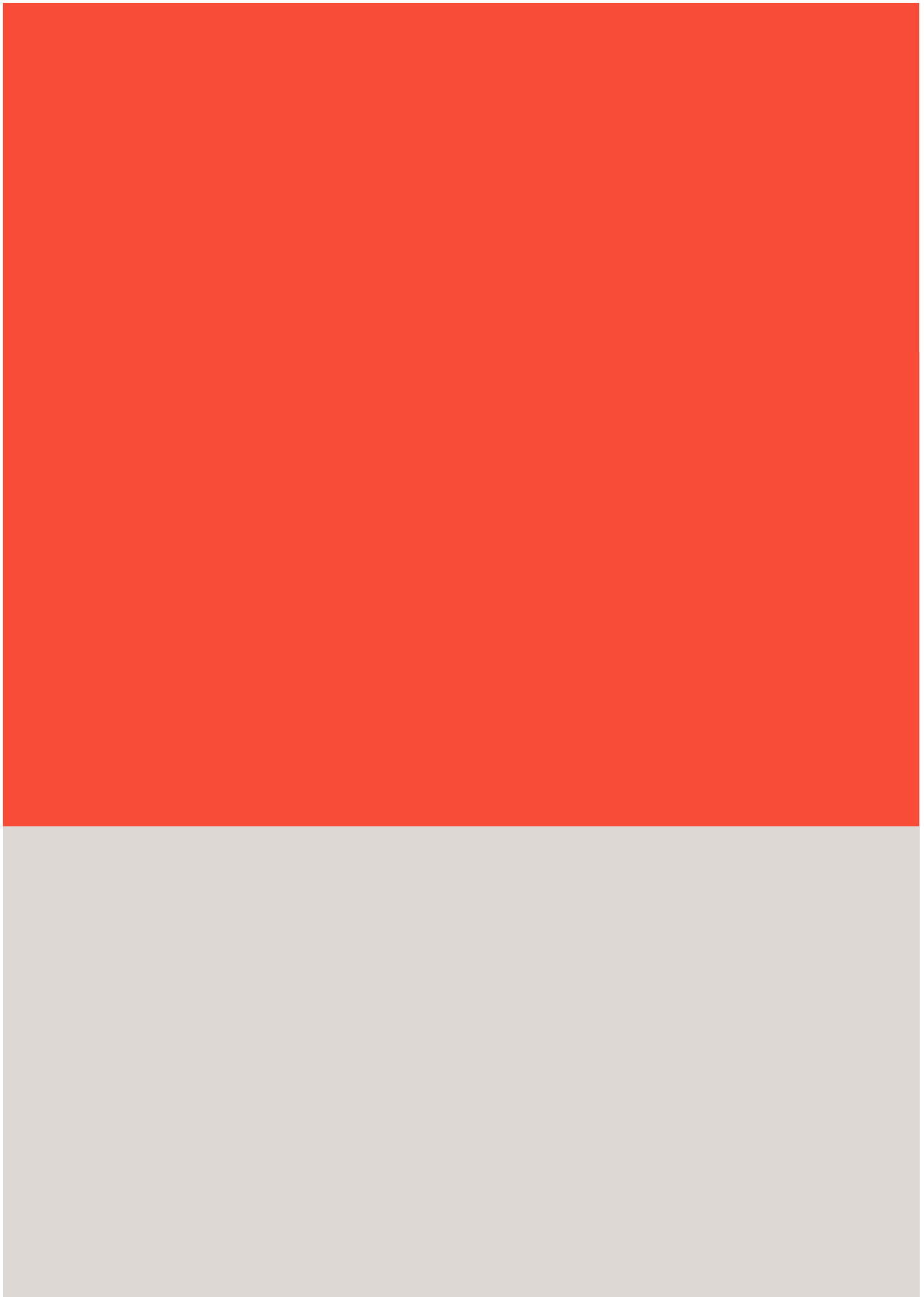
Increased regional output through stimulation of additional mining investment and construction activity associated with the project.

Construction costs for the facility estimated at \$800 million to \$1.2 billion



Reduced barrier to entry for the production and processing of New Economy Minerals including copper, cobalt, zinc, lead, silver, gold and other commodities including high analysis fertilisers

**Current ~150,000 tonne copper domestic production
Enabler for Townsville refinery extension**



Diversification and Transformation of the Mount Isa Economy

Small and Medium Business

STRATEGIC PLAN & DELIVERABLES

REPORT MAY 2024



Prepared on behalf of:

Mount Isa City Council

Prepared by:

Urban Economics

MAY 2024

23132

Warranty

This report has been based upon the most up to date readily available information at this point in time, as documented in this report. Urban Economics has applied due professional care and diligence in accordance with generally accepted standards of professional practice in undertaking the analysis contained in this report from these information sources. Urban Economics shall not be liable for damages arising from any errors or omissions which may be contained within these information sources.

As this report involves future market projections which can be affected by a number of unforeseen variables, they represent our best possible estimates at this point in time and no warranty is given that this particular set of projections will in fact eventuate.

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Contents

1.0	CHALLENGES & IMPEDIMENTS TO GROWTH	1
1.1	Economic Development Strategies and the SME Economy	1
1.2	SME Challenges & Impediments to Growth.....	4
2.0	GAPS & SUPPLY CHAIN INTEGRATION	8
2.1	Gap and Threshold Modelling	8
2.2	Vertical and Horizontal Integration	9
3.0	A BRIGHTER MOUNT ISA -Dream	13
3.1	Newspaper	13
3.2	Business Hub	15
3.3	Retail Renewal.....	18
3.4	Childcare Centre	29
3.5	RV and Caravan Park.....	33
3.6	Shuttle Bus	36
3.7	Motorsport Precinct	36
3.8	Other Industries.....	40
3.9	Medical Centre	41
3.10	Resource Centre of Excellence For New Economy Minerals	42
4.0	ACTION PLAN & DELIVERABLES - Design.....	44

1.0 CHALLENGES & IMPEDIMENTS TO GROWTH

1.1 Economic Development Strategies and the SME Economy

With a development economy and history built firmly around the mining sector, it is challenging for the Small Medium Enterprise (SME) sector to envisage, to “dream” or consider possibilities for a more diverse Mount Isa economy. When asked what additional businesses, activities or services would assist their business during the transitional phase of the closure of Glencore’s underground copper mine, the only three key opportunities that stood out in terms of number of respondents identifying these as opportunities were:

- Bringing more jobs, people or businesses to town 12%
- Additional tourism opportunities 12%
- Addressing security/crime 10%

There were a variety of other opportunities or sectors of interest with the following word cloud highlighting the key word themes and interests of small and medium business owners when considering opportunities for diversification of Mount Isa that may assist their business; maintaining and growing the mining sector including expansion into other minerals and resources and industry generally was an underlying theme reflective of the importance of the sector in the economic role and functionality of Mount Isa.

The Phase 2 piece of work therefore identified 10 key opportunity themes for the Mount Isa economy with implications for the SME sector particularly around support strategies for existing businesses and opportunities to improve and challenge the places of business for the SME sector in Mount Isa:

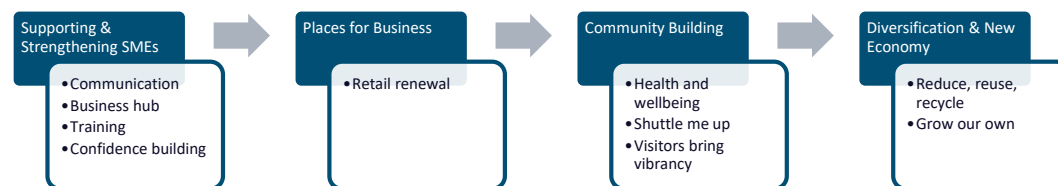
- Communicate to accelerate – local newspaper, community welcome packs, resilient signage
- Business hub – business resources, mentoring support, access to government support, networking
- A retail renewal – 7 day retail trading, pop up shops in vacant shops that could rotate on a month to month basis and allow startups to promote their goods and services
- Training to excel – Mount Isa mining centre of excellence, expansion of locally delivered certificate II and II programs as well as workplace certification programs
- Reduce, reuse, and recover – tip shop, cans/bottle recycling, metal and battery recycling
- Health and wellbeing – childcare and residential aged care facilities
- Grow our own – hydroponics for fresh produce, market gardens and regular community markets building on the diverse ethnic community and a demand for resilience
- Shuttle me up – regular shuttle loop service between the airport based around key flight arrivals and departures, the city centre and suburbs to improve accessibility for residents, including access to shops and schools, and for visitors and passengers
- Visitors bring vibrancy – motorsport complex, RV friendly town status, cultural tourism, outdoor lifestyles
- Building confidence – reduce planning red tape, upgrade buildings, maintain upkeep of commercial and residential, access to trades

This Strategy Investigation drills deeper into the particular projects and opportunities that reflect these themes in supporting existing businesses, the places and spaces in which they operate, with the final piece of work exploring next steps, key agencies and delivery mechanisms.

Secondly, the potential to promote growth and development in the Mount Isa economy in attracting new businesses and diversifying the existing economy including key strategies, actions, deliverables and responsibilities has also been explored through vertical and horizontal integration investigations and key gap and threshold analyses in identifying key strategies, actions, deliverables and responsible agencies.

The following highlights the integration opportunities based on the environmental scan approach of Phase 2 and understanding or “discovering” what already works within the SME sector in Mount Isa, the needs of businesses to support their current and intended operations and activities and identified activities or constraints to their business, recognising that there are certainly cross overs between these themes and principles.

For example, a business hub as a resource and mentoring support centre to support businesses in their growth and development, would also represent potential physical use of space and contribute to commercial premises within the CBD, whilst similarly, the development of childcare centres or places would support the social fabric of Mount Isa, contribute to opportunities for businesses to attract workers and again represent development activity within Mount Isa.



1.2 SME Challenges & Impediments to Growth

A key element of the scope of works was to identify, explore and test the challenges and impediments to the growth of the SME sector in Mount Isa, which formed the basis of the Environmental Scan, and as highlighted in the following graphic, can essentially be grouped within three key elements:

1. the structural economy of Mount Isa and the Australian economy more particularly and the performance of the macro economy
2. the strength and sustainability of the community including the depth of facilities and amenities that contribute to a sense of community, vibrancy and place
3. the local and regional role and location of Mount Isa including the role of Council, the State and Federal Government in delivering services and sustainability of the lifestyle in Mount Isa

A range of the identified challenges and impediments to growth were also explored and considered as strategic opportunities for the SME sector and the economy generally, including the closure of the underground copper mine and its ability to avail the local economy and businesses with additional labour from those workers not wanting to relocate from Mount Isa.

Similarly, the depth of energy and resource sector projects mooted, under investigation and progressing within the Mount Isa and North West Queensland region will further challenge local SME sector businesses to access staffing, training and facilities, but also present opportunities to diversify their business and client base in catering to these projects. Timing is a critical factor in their delivery

and potential as is real and responsive Federal Government commitment to fast-tracking a number of these projects in supporting confidence in the economy.

Structural economy shifts are related to increasing or changing demand, including increasing demand for services, demographic changes influencing demand for aged and health care, industrialisation of Asian countries and their accelerating demand for resources, economic and labour market reforms, including the 2023 revision to 417 visa working days and hours, and technological advances and changes.

For instance, a report from the Productivity Commission in 2014 noted that a region experiencing job losses through the closure or structural repositioning of a significant employer or industry, may also be subject to labour market mobility challenges, with opportunities for the local Mount Isa economy, but also a need for clear pathways to address these mobility challenges. Key mobility challenges highlighted by Stephen Jones and Chai Tee¹ included:

- *“family circumstances, as well as social networks and other connections to a particular region;*
- *differential housing costs, which imposes a financial constraint on workers moving from one region to another, particularly from a declining region where property prices are falling;*
- *occupational licensing, which prevents some workers easily taking up jobs in a different state;*
- *lack of skills for jobs in a different area; and*
- *geographic based employment services, which limit matching of potential workers to jobs in other region”*

Many of these factors have already been highlighted through discussions with SME sector representatives including potential impacts on housing costs and affordability to relocate, the licensing and certification of workers within Glencore that may not be readily translated to other work sites, other mines or other industries and the alignment of skills and occupations with the mining sector particularly. Again demonstrating that these are challenging the operations of SME businesses, but with concerted strategies and actions in place, can translate as strong opportunities for diversification of the Mount Isa economy.

As an example, the consultation did note that there are discussions between the hospital sector and potential displaced workers from the underground mine closure, with opportunities for working in wards and other lower skilled but manual positions critical to the operation of the health facility.

¹ Experiences of Structural Change, p.22

Community factors recognise that there are large segments of the SME economy that are population servicing, and sustainability of the local community therefore affects the availability of labour as well as demand for products and services. Crafting and creating an amenable Mount Isa lifestyle contributes to maintaining a sustainable local population base and confidence in forward demand for local population servicing activities e.g. retailers, auto servicing and repairs, professional services, health care.

Challenges in securing childcare places for instance may restrict the capacity for some segments of the labour market to take up available city or population servicing employment and business opportunities, or reduce the hours key workers are prepared or can accept within the market, impacting business productivity and opportunities for growth.

Similarly, the overall *Physical Environment* of Mount Isa and the North West Region and how the region responds to and promotes opportunities for businesses including affordable commercial spaces for startup businesses, the quality of the local environment that promotes a sense of vibrancy and vitality, business and community pride, and improved connectivity for business and local residents recognising the regional and remote role of Mount Isa.

Business presentation, street amenity contribute to a sense of vibrancy and vitality, whilst poor presentation, significant vacancies and a lack of public realm can undermine the sense of confidence and community pride in the spaces and places available to do business in Mount Isa.

Transparency, communication and confidence around mooted projects and indeed to real actions from all levels of government is fundamental to the SME sector in understanding, planning for and addressing the macro and micro challenges for the economy more broadly, and pertinent to the operations of SMEs, with the potential to effectively turn a multitude of these challenges and impediments to growth and business operation to real opportunities and diversification potential within Mount Isa.

Businesses highlighted a lack of transparency, a lack of clarity and poor levels of communication in undermining their confidence in the Mount Isa economy and as an opportunity and environment in which to undertake business.

Structural Economy	Community	Physical Environment
<ul style="list-style-type: none"> •availability of staff and labour •immigration patterns and working visa requirements •wages and salaries •training networks •transport and shipping/freight •red tape restrictions •reliance on one key business/ industry sector •cost of business •FIFO workforce shifts •closure of underground copper mine •major energy/resource projects •retail trading allowable hours 	<ul style="list-style-type: none"> •safety and security •housing •accessibility •lifestyle, recreational amenities •population growth rates •FIFO workforce 	<ul style="list-style-type: none"> •pride and upkeep of the City •commercial and retail vacancies •state of commercial and residential buildings •living and working remote •connectivity through rail, road and air networks

2.0 GAPS & SUPPLY CHAIN INTEGRATION

2.1 Gap and Threshold Modelling

For a population base of 18,945 persons as at June 2023², Urban Economics has undertaken a top-level threshold modelling exercise to explore current gaps in the provision of services and facilities, *ceteris parabis*, meaning all other factors remaining equal such as the willingness of GPs and other medical professionals to locate in a regional and remote centre such as Mount Isa.

This threshold modelling is effectively identifying those gaps or facilities from a population servicing perspective that would contribute to the overall amenity and liveability of Mount Isa is catering to the local community and in the overall attractiveness of Mount Isa for future workers.

It is also recognised that Mount Isa also functions as a regional centre, with a broader catchment population of around 27,000 persons as at June 2023 including the surrounding regional LGAs of Bourke, Boulia, Cloncurry, Doomadgee.

There are therefore a range of population servicing activities and facilities that would cater to the needs of the local and regional community including a number of identified gaps in the local mix of facilities that would contribute to the overall sense of liveability and amenity of Mount Isa for a residential population.

TABLE 2.1: Threshold Modelling

Sector/Facilities	Rate of Provision	Inferred Demand	Current Supply	Theoretical Gap	Comments
GPs	106.6/100,000 in outer regional, remote and very remote	20	8	12	There are nominally additional GPs in Mount Isa, but Urban Economics was only able to find 8 that advertised having appointments available
Physiotherapists	46/100,000 in remote and very remote areas	9	6	3	An above average demand in line with a physically demanding work environment is anticipated.
Vet	72/100,000 in Queensland	14	2	12	Regional demand for animal services.
Pathology	7.85/100,000 in Australia	2	2 clinics	No gap	
Radiology/Imaging	14.3 MRI Machines/million in Australia	1	1	0	The Mount Isa Base hospital currently has an operational MRI machine

² ABS Regional Population 2022-2023 by LGA

Psychologists	42.2/100,000 in remote areas	8	2	6	There are currently two registered psychologists in Mount Isa, one in private practice and another providing services through the local medical centres.
Pharmacies	4,500 persons per pharmacy	4	2	2	But potentially impacted by the number and distribution of centres, including impacts by the pharmacy location rules.
Residential Aged Care Beds	78 beds/1,000 70+	77	53	24	There are two
Retirement Living Units	6.2% 65+ in ILUs	96	0	96	Urban Economics was unable to identify any independent living units in Mount Isa, with the only elderly-specific accommodation being residential aged care
Childcare places	3:1 0-4 years to places	517	246* including Red Oasis	271	The Red Oasis childcare centre seems to have recently closed, leaving the Goodstart and Mary MacKillop centres as the only two in Mount Isa. Potential for partnership with schools, hospital and Council as site opportunities.

2.2 Vertical and Horizontal Integration

Urban Economics has been provided with a list of directly impacted businesses whose contracts with Glencore’s underground mine will cease with the closure of the mine. No information as to the value of these contracts has been provided for confidentiality purposes, noting that all but two of the operations are directly Mount Isa located businesses and operations.

More particularly, of the 23 directly impacted businesses, 11 are local Mount Isa businesses or franchise operations, with the remainder either operating a branch location in Mount Isa or multi-site/locational operations.

Those with operations elsewhere including Townsville have the opportunity to capitalise on the more than the some 45 coal mining, other minerals and heavy industry projects with project timelines beyond 2025³, whilst the 11 local businesses or franchises are more likely to be subject to greater levels of impact on performance and forward viability.

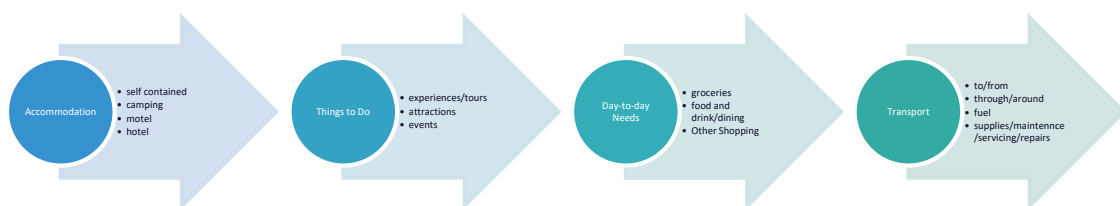
³ QCMA Queensland Major Projects Pipeline 2023

There is a concentration of businesses within:

- engineering/manufacturing/fabrication
- labour hire
- accommodation solutions

Whilst the range of mooted mining, resource and energy projects in and around Mount Isa and the surrounding region may support and bolster the mining and engineering related businesses including the accommodation solutions activities, opportunities to diversify the economy that build on these inherent strengths and operations draw on the opportunities that may be derived from expanding the visitor economy and to the diversification of the Mount Isa economy more generally.

Visitor Economy



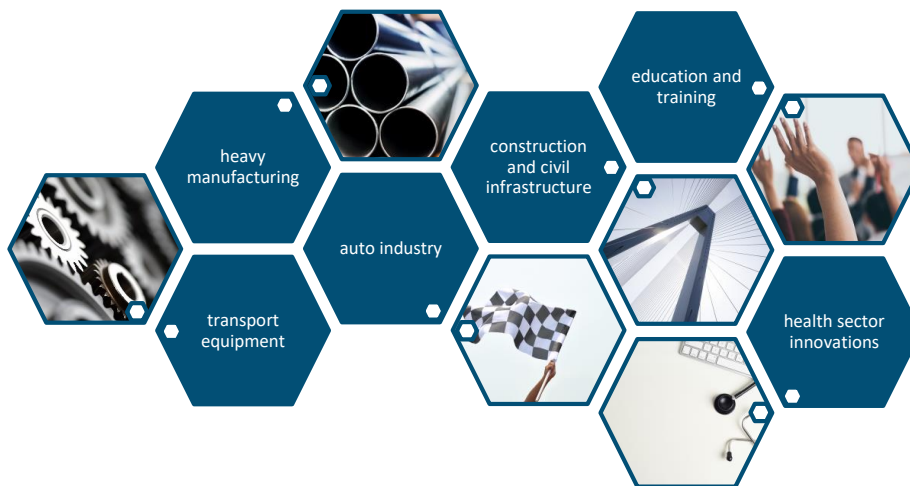
Whilst on-site mine tours and experiences are not an opportunity, there are other features, facilities and characteristics of Mount Isa that can be built on and expanded in growing the visitor economy which could be further addressed by a specific tourism pillar critique including:

- Indigenous cultural experiences including indigenous art centre
- Lake Moondarra utilisation, improved access and event activation including growth of the fishing classic, triathlon events, Gordon River training events etc
- Improvements to the visitor centre as a true promotional showcase
- Camping and 4WD experiences
- RV friendly town and stop over experience

- Self-contained camping
- Utilisation of Buchanan Park
- Other events and festivals
- The outback pub experience
- Motorsport events and activities

Whilst these opportunities may be better addressed by a specific tourism economy pillar, it is recognised that there are significant alliances of the tourism industry with the SME sector, particularly in regional areas with the regional visitor economy intrinsically operated by the SME sector in particular. The following sector therefore explores the opportunities and business case for a series of these

Integration with Engineering/Fabrication Businesses



As noted earlier, we have been advised that there are investigations underway for deployment of displaced workers who have not otherwise secured another position within Glencore or other mine site, into the wards of the hospital in supporting the labour intensive needs of the health sector. This represents a re-purposing and repositioning of the labour force. Similarly, there are opportunities for existing businesses to cater to the needs of an expanded regionally significant health sector including:

- Equipment and materials
- Catering
- Labour
- Cleaning and laundry solutions

-
- Marketing and signage

Refinery and smelting (again under the auspices of other pillars) could support the pivoting and diversification potential of some displaced engineer and manufacturing businesses. However, ensuring that there is land available to support these needs including support manufacturing and transport businesses is a critical element in maintaining confidence in the City to respond to such opportunities. Partnering with the State in the delivery or supply of land for heavy or noxious industry purposes within the City may support any identified opportunities within this sector.

Of particular interest for the SME sector in building on the importance and value of the engineering and mining supply sector within Mount Isa, the following integration opportunities with other industries and sectors have been identified:

- Education and training
 - mine training centre of excellence
 - employment of trained workers within the TAFE and RTOs
- Auto industry
 - repair and maintenance of major resource sector fleet
 - repair, servicing and maintenance of local vehicles
 - repair, servicing and maintenance of agricultural sector equipment
 - repair, servicing and maintenance of 4WD and RV's travelling through the area
 - motorsport precinct/events
- construction and civil infrastructure
 - supplies and equipment
 - trade labour
- other maker/creative spaces
 - production of mining equipment and supplies for workers
 - indigenous art centre and creator space

3.0 A BRIGHTER MOUNT ISA -Dream

This chapter explores the individual short term and longer term opportunities and projects that have been identified as a result of the environmental scan, the consultation process and the challenges and risks identified with the current state of the Mount Isa economy.

3.1 Newspaper

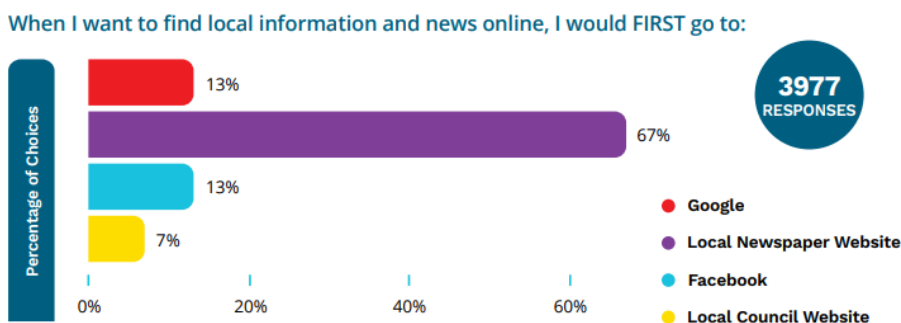
Throughout Urban Economics's stakeholder consultation process with local business owners and representatives, the issue of local communication and transparency was raised, with a strong desire to see more coverage of local issues and for businesses to be better informed as to events, activities and opportunities within their community. This would contribute to the understanding of local news and council business, allowing residents to have a greater say and ability to advocate for issues in their local community.

Across much of regional Australia, there has been a decline in the number and reach of independent regional news, with many local papers being absorbed into larger conglomerates and offering more syndicated columns and articles covering national and global stories instead of local issues. While this has naturally occurred due to the internet and social media changing the way many Australians consume news, COVID-19 accelerated this process, and larger organisations such as Australian Community Media and NewsCorp Australia closed many local papers completely, despite the increased need for local reporting on the pandemic and associated restrictions.

Despite the internet giving readers easy access to news sources across Australia and the world, readers in regional and rural areas still demand coverage of local issues. Deakin University published a study in 2023 investigating the state of local independent newspapers, finding that local papers were extremely important and that 67% of audiences would go to a local independent website first to find local news as opposed to Google or Facebook. Notable as well was the finding that readers were 10 times more likely to visit their local paper's website for information in comparison to the local council website.

The report also underlined the often underestimated importance of printed local newspapers, with the older demographics in regional areas valuing physical news as opposed to solely digital articles and coverage.

FIGURE 3.1: Preferred News Source, Regional Consumers



The North West Star paper was formerly a daily newspaper until 2008, before being sold to then Fairfax Group and is now operated by Australian Community Media. It stopped publishing a print edition due to COVID in 2020 and is now a digital only service. Other major media in the region includes ABC North West, which publishes online articles and operates a local radio station. However, outside community radio, there is currently no local media that offers the opportunity for local businesses to advertise and for residents to consume local news.

As a result of the investigations of the Environmental Scan and consultation process, the opportunity to bring back to Mount Isa a print and digital newspaper was recommended, and agitation within the market has elicited a real proposal for a committed independent print newspaper in Mount Isa, that would publish in print on a weekly basis and operate independent of any existing news organisation. The proposed editor and operator created and edited the Cape York Weekly since 2020 before on-selling the paper, providing coverage of local news, business, politics, community and sport – whilst also offering weekly opinion pieces.

The “North West Weekly” aims to set up and begin operations with the short term, allowing it to attract advertisers in Mount Isa’s peak event season leading up to the Rodeo in August that will help sustain coverage during the low season over summer. Given the recent news of the closure of Glencore and the upcoming Queensland state election in October of 2024, there are also a number of public policy announcements that would benefit from specific local coverage.

Initial startup costs are estimated at ~\$100,000 to operate in its first year – to cover the cost of office space, journalists and vehicle transport, with additional funding to come from local advertisers and an annual operational cost of \$500,000. The proposal also raised the establishment of a community board of 5-6 people with oversight of the paper, to ensure editorial independence and direction.

There are considerable economic and community benefits that could be derived from the committed operation of a weekly newspaper including:

- contributing to community, transparency and clarity around Council activities
- informing community, not for profit and business groups about funding sources and resources
- exploring the opportunities identified through the Diversification projects
- highlighting events and activities for local residents and visitors
- contributing to community pride
- support for community groups and sporting organisations
- business awareness and marketing opportunities
- general news and activity
- informing less engaged and older demographics

3.2 Business Hub

Business Hubs and co-working spaces are often proposed as ways of bringing together local business owners and operators together to increase the potential for collaboration and provide professionals, remote workers and sole traders with low-cost office space in areas that do not have a great deal of existing supply, such as regional areas.

Again building on a need for better clarity, information, resourcing and support, a business hub is proposed as a short term partnership opportunity for Mount Isa that can be delivered in a very short period of time, utilising existing physical infrastructure such as vacant commercial office space, and bringing into a central location the resource, networks and support systems of:

- state government agencies
- Council
- Local business groups e.g. Commerce NorthWest

The business hub is intended to offer businesses access to:

- Affordable spaces including co-working and meeting spaces
- Business resources including access to funding, grants, business start up processes and assistance, advice services
- Mentoring support
- Networking opportunities
- Workshops and business tailored events
- Internet and other office support needs for small businesses

A concierge service to assist businesses in accessing the tools, assistance and resources they require, oversee bookings and provide the conduit between business and government agencies is recommended.

As a collaborative space and opportunity for businesses, it is considered that whilst not wanting to be “all things for all”, that there is potential for a really unique business hub that is a:

- Resource centre
- Affordable commercial space
- Affordable maker/distributor space for e-commerce/creative startups
- Start up space to test the potential for an Indigenous Art Space

In terms of location, an ideal area for a business hub would be in the Mount Isa CBD, attracting more businesses back to the city centre in an effort to make it a more attractive and convenient option for both workers and shoppers by increasing the level of foot traffic.

A longer term solution is an expanded facility within a redeveloped Mount Isa City Library and civic precinct if the masterplan for the library progresses with significant cross-resourcing and utilisation of activities and spaces.

Examples in regional areas include the ‘Upstairs’ precinct in Bathurst, a regional start up hub supported by Reliance Bank, Bathurst Regional Council, the NSW Premier’s Department and Charles Sturt University. Located above the Reliance Bank branch, the co-working hub is in the centre of town, close to shops and retail, making it an attractive place for startups or remote workers to hotdesk and use meeting rooms, as well as local bodies to host events of up to 80 people.



Upstairs, Bathurst

Another example is the Hunter Region Business Hub in Kurri Kurri, which along with office space and meeting rooms offers small industrial units of 100m² for locals to hire. This style of development provides an affordable space for small micro-businesses to operate and store stock in, providing an opportunity for them to scale up and operate, potentially shifting away from being home based businesses as they test markets and seek to expand and grow their operations.



Hunter Region Business Hub

If located in the Mount Isa City Centre, this represents a great opportunity for local small and e-commerce businesses to find an affordable location that can also be secure (in the industrial units). Given the difficulties for Mount Isa locals regarding freight transport, a centralised hub could act as a mini distribution centre for Mount Isa and the surrounding region, allowing deliveries to be made faster to a single location and online businesses a quicker way to distribute to their customers.

Depending on the location and the types of tenants, the industrial units themselves could be opened up on the weekends to create local markets and allow tenants to sell their products, whilst also bringing more people back into the Mount Isa CBD.

TABLE 3.1: Details on Regional Business Hubs

Name	Upstairs	Highlands Hub	Hunter Region Business Hub	Goondiwindi Business Hub
Location	Bathurst	Glen Innes	Kurri Kurri	Goondiwindi
Uses	Collaboration spaces, hotdesks, meeting and event spaces	Co-working, training, meeting facilities	Office space, meeting rooms, industrial units	Office space – fully occupied
Price	<ul style="list-style-type: none"> Meeting spaces – \$30/hour Fulltime membership – \$335/month Part time membership (10 visits per month) – \$210/month 	<ul style="list-style-type: none"> \$1,650 yearly membership 	N/A	N/A
Notes	<ul style="list-style-type: none"> Community Coordinator 5 days Event Spaces pax 80 standing 	<ul style="list-style-type: none"> Hosts variety of events including: Marketing for Tourism SMEs, Tending for Council, Budgeting for Community Groups 	<ul style="list-style-type: none"> Provides mentoring and business support services, such as an entrepreneur program and courses on digital presence, marketing and business development Provides industrial units for small businesses to use 	<ul style="list-style-type: none"> Often used by nearby farmers for internet access

3.3 Retail Renewal

Noted in the survey responses and stakeholder consultation was a desire to do more to support businesses in town, especially in the CBD and central streets in town. Especially given many businesses have faced break ins and property damage in recent years, making them challenging or expensive to insure, there is a strong need to support the revitalisation and renewal of the town centre and make it enticing for both businesses and shoppers.

Urban Economics notes the Mount Isa CBD Masterplan’s aim to improve the streetscape and offer shade and urban greening to make the CBD a more pleasant place to live and shop in. While there is existing greenery and shaded areas, there is always potential to improve and further encourage the development of pedestrian friendly streetscapes. The below images are from Miles in Queensland, and show that even in streetscaped areas, there is potential for further activation and collaboration with local businesses, with café seating extended outside to encourage more people to stay instead of just passing through.



More particularly, an investment targeting street activation, screening and placemaking can be staged over time, including entry signage and tied funding to encourage landlords to upgrade commercial premise frontages.

We recommend selecting the next street to promote and fund works as part of the overall City Centre masterplan upgrade and to undertake in stages to optimise outcomes for businesses and the community.

Placemaking is a collaborative process and philosophy that inspires people to collectively reimagine and reinvent public spaces as the heart of the community. Using community-based participation an effective placemaking process capitalises on a local community's assets, inspiration and potential and results in the creation of quality public spaces that people want to visit often and linger longer.

Mt Isa City Council has recognised the potential of placemaking to uplift the city's Central Business District (CBD) and has incorporated placemaking into its' *2022 CBD Masterplan*. The Masterplan 'Principal Orb' shows the plan's full list of place themes as considered against the 10 objectives and community values.

Many themes apply to placemaking including:

- Pedestrian Friendly Street and Places
- Street lighting
- Public art
- Wayfinding landmarks
- Alternative uses
- Events

However, the Principal Orb may be hard to follow, and it is unclear what point of development/implementation any or all of the themes are at. Similarly, *Section 2.2 City Centre Placemaking* provides an overview of placemaking and its benefits but does not provide any actions, timeframes etc. From a placemaking perspective a natural place to start is the CBD.

The CBD has an existing establish set of businesses, including local and national retail and commercial operators, and has a defined geographic area that makes it a good candidate for a dedicated placemaking effort. This is also in line with the precinct model set out in the Master Plan.



This effort should aim to improve the and revitalise the area through a combination of events and activations, streetscape improvements and business initiatives. In order to ensure community buy-in and be sure that efforts are directed in ways that the community want and support, it is recommended that a volunteer group of local business owners, interested parties (building owners and residents for example) and the City be established to work together to develop an action plan for the CBD.

Establishing a dedicated community lead volunteer group which works directly with the City will allow for the development of site-specific actions and initiatives that are community lead. It is important that the City actively supports the local community's efforts at placemaking and revitalisation within the CBD. The City should actively support persons or groups looking to enhance the CBD through the establishment of a Place Manager (or similar) position within the City whose job it is to work directly with the community to support and foster activities.

The City should also look at providing funding for grants to be used in delivering community events and ensure the Place Manager understands and can assist with any application processes.

A possible Mt Isa CBD group could have the following mandate:

'To improve and enhance the Mt Isa CBD to make it a vibrant and inviting place which people want to visit and return to.'

This would support and work towards the Master Plan's vision statement:

'Mount Isa has an activated safe, engaging and vibrant CBD that celebrates its uniqueness, and offers opportunities for families, individuals, visitors and businesses alike.'

Areas of focus could be divided in three sections:

- Build form improvements – street furniture, planting and shade trees, lighting, wayfinding and public art
- Events and activations – youth events, small activations, festivals, multiday events
- Local business improvements – working to promote local business, sharing ideas and information, leveraging other initiatives to promote the CBD.

Projects and initiatives in each category can be developed and should be a mix of short, medium and long term. New street furniture or tree plantings may take time, where a public art project can be achieved short term. Projects can also be temporary in nature, such as chalk art, or inexpensive such as wrapping fairy lights in trees.

Likewise, the area in which the activities are focused can start small and grow over time. Focus on one or two streets and key intersections, then expand in line with the Master Plan's Precinct model.

Finding a local identity or sense of place is critical to good placemaking. What makes Mt Isa? Is it the location, the history, mining, or a sense of community? Is it a family community, does its rodeo and western roots set the tone? Identifying the local identity will help give direction to placemaking efforts and reinforce a sense of place.

Any plan for the CBD should aim to improve walkability and aesthetics for the area, which will encourage visitors to linger longer and return more often. Heritage and Cultural points of interest will help educate visitors to the area.

The medium-term goals for any action plan should be aimed at improving the identity or sense-of-place for the entire area. The CBD would no longer reflect a series of independent businesses, but an entire connected district that is an attraction in-and-of itself, supported by a pleasant environment, public art and events to encourage visitors. This in turn will increase tourism, and the amount of time and money people spend in the CBD. Locals will also be encouraged to make repeated visits, as the overall attractiveness of the area will be enhanced.

The long-term goal for the area should be an aspirational one, such as making the Mt Isa a draw for the entire northern region of the State, or a 'must-do' stop on the caravan trail.

Small scale, short-term activations:

All of the proposals would require a small team to work with the City to organise and promote.

1. ***Design and deliver a community art project in the CBD.*** Public art can take many forms and can be as simple as colouring a section of sidewalk or retaining wall with chalk or paint. Street stencils are another inexpensive way to add temporary art to an area. The stencil designs can reflect the area's history, culture or amenities. Larger projects can involve working with local artists to design and deliver wall murals, painted series of planter-boxes or laneway art. These mural projects can be collaborative, where the community is invited to participate in the design and painting of the art. Street art can be renewed on a regular basis.
2. ***Pimp My Pet.*** A popular option is a community dog show, inviting the community to enrol their pets in a fun dog show with various prizes donated by local businesses. This would require a safe space to hold the competition, such as a park, civic square, or the closing and use of a car park or side street. It would also require some temporary shaded areas and PA system. The event could be advertised to other areas within the region to attract out of town visitors and competitors. During the day of the event local businesses could use the uptick in visitors to promote their businesses through sales, specials and additional marketing.
3. ***Foot Traffic:*** engage with a series of "foot based" large scale fun sports e.g. Foot golf, inflatable sports egg foot darts, ninja courses.
4. Working with local sports clubs could also lead to the development of special event competitions in the CBD, such as a roller-hockey game in a CBD carpark, or a free basketball or soccer clinic. These types of events attract a wider audience to the CBD and should be combined with retail sales events in promoting opportunities for SMEs to expand and grow their retail performance. It also provides the sporting clubs an opportunity to engage with the wider public and grow their clubs.

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5. **Youth activations**; similar to sport or competition activations, but aimed at youth, these events could include skateboarding clinics, sport clinics, community art projects, building a box fortress, or other ideas aimed at attracting youth and their families to the area.
 6. **Instagram/social media spots** – create a series of social media friendly murals or art installations, number them and disburse them throughout the CBD. This will encourage visitors to look for all the locations, and post to social media. The city or business group can create some hashtags that can be used in combination with the Instagram walls, and this will help increase social media presence and vision of the CBD. If the murals/art are temporary they can be relocated periodically throughout the CBD and the images can be refreshed. For instance, during rodeo the images can all have a western theme, other themes could include heritage, mining, outback/nature, community etc.
 7. **Car free day** – close some streets within the CBD and encourage businesses to spread their wares out onto the sidewalks. Set up temporary seating, music and arts activities (chalk on the pavement, painting the bollards).
 8. **Car rally and sausage sizzle**- invite the community to bring their cars to the CBD for a car rally and free/gold coin sausage sizzle. Work with the city to secure prime parking spots/area for cars to park in close proximity to each other and the sizzle. Can become a recurring event.

All of the above activations require little capital and organisation. Many could be used in combination, such as car free day combined with other activations, such as youth activities, public art projects and music.

Businesses in the area would need to take advantage of any additional visitors the events bring to the CBD by offering sales, promotions and should be encouraged to enhance their shop fronts to attract attention.



Image source – Google

Medium activations-

These events will also require organisation and support from the city but are larger in scope or frequency. The success of the short-term activations can act as an indicator as to which should be rolled out on a regular basis.

'Up Late in Mt Isa' unified late night trading initiative to build on businesses that currently trade during evenings in Mount Isa, but to create an event that CBD businesses collectively agree on one evening to stay open for an additional late night trading in line with activations and activities. These could include buskers/musicians performing at designated spots within the CBD, free outdoor movie for children (project a movie onto a wall in a park, parking lot or open space, participants bring their own chairs or sit on the ground, provide popcorn so kids can watch a movie while their parents' shop). Minor improvements to the streetscape such as fairy lights and disco lights to enhance the festive nature. Consider closing one or more side streets to allow pedestrians to walk freely on the road and use this space for activations, including temporary seating and tables, children's activities, music etc. Opportunities for small and micro businesses to operate food trucks in contributing to the sense of vitality and activity and for SMEs to test markets, products and services.

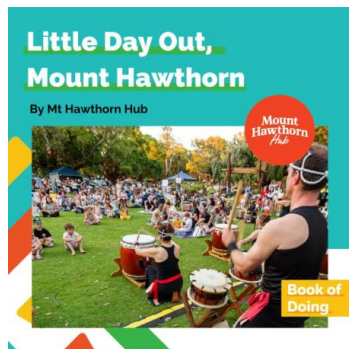
Free concerts – Organise a free concert featuring local bands. Vendors can set up temporary stalls in a park or car park, or look at closing a side street. Would require sound equipment and stage or elevated area. Could become a recurring event.

Market trail- use novel wayfinding, such as signage and a map to create a 'trail' of businesses throughout the CBD. Kids could get a stamp from each shop on the trail they visit, completed stamped maps/booklets could go into a draw.

Makers Market- open air or in an available space within or adjacent to the CBD. Organise a maker's market featuring the works of local crafters, artists and makers. Could reoccur at regular intervals. This could transition to a permanent shop where local makers can sell a selection of their products with rotating makers/artists being featured. This would need to coordinate with a potential indigenous art centre, makers and creatives space at the proposed business hub.

Community Long Table Dinner – Long table dinner is held in an outdoor venue (town centre, closed street) for which tickets are sold. Guests are seated at long tables and served a meal prepared by local restaurants. Different restaurants and suppliers can provide different courses/dishes, again offering opportunities for SMEs to test markets, explore new product offerings and expand their service mix.

Progressive dinner- Similar to the long table, tickets are sold to a progressive dinner, where dinners start at one establishment for drinks and aperitifs, then moving to another restaurant for mains, followed by a third venue for drinks and desert. This activity highlights various food venues and gets people into the CBD. Could be combined with late night trading and again is a strategic opportunity for SME retail and food and drink venues.



Source Google

Larger and Longer Term Actions

Larger actions require longer planning and organising as well as larger budgets. Longer term actions can include designing and developing a calendar of events for the CBD utilising all of the activities above and/or combining several. Having a schedule of events give the community something to get excited about and look forward to, and can also help attract volunteers who have a particular interest (i.e. musicians to help with concerts and busking, artists to assist in public art projects). The organising group will need to be confident in their ability to deliver all the projects that are announced.

Built form improvements- these are longer term items that need to be undertaken with the support of and actions by the City. Local groups can work together with the city to select things like street furniture, plants, planter boxes that complement each other, are in keeping with the identity of the area and are installed in areas that will provide the best outcomes.

The aim of the built form improvements is to:

- Improve the built environment through the provision of a wider variety of seating, plantings and shaded areas, and enhanced road crossings for pedestrian safety.
- Provide spaces for cultural and heritage engagement – include such things as ‘points of interest’ plaques and maps, historical information and timelines within the built environment and provide areas for entertainment, such as areas for musicians and buskers to perform.
- Provide economic opportunities – by improving the walkability of the area, tourists and visitors will be encouraged to linger longer and be more likely to return, increasing the chances of their spending money in the area.
- Improve way-finding to assist visitors find shops, restaurants and other attractions.

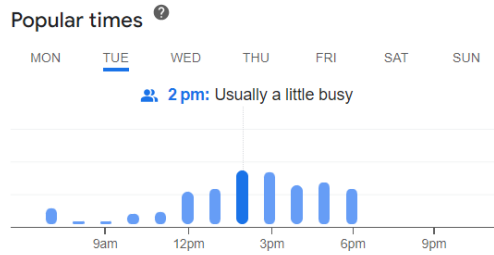
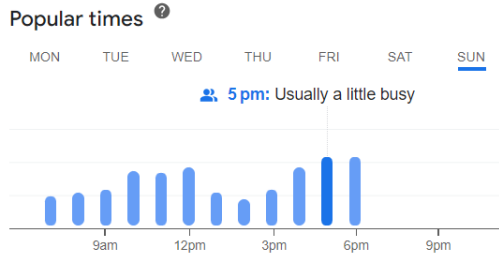
Entrance statements and large-scale public art projects – large art pieces or installations that signal the entrance/limits of the CBD. Could be related to mining, heritage or Mt Isa identity.

Festivals and large events – events that close most or all of the CBD to traffic and allow visitors to roam freely.

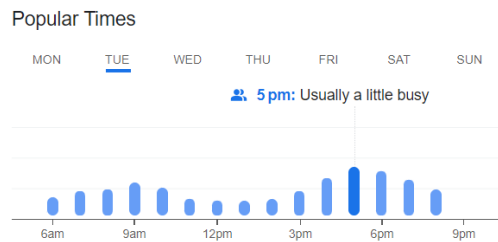
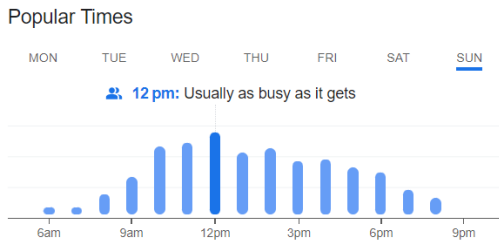
Another outcome of the community consultation was discussions around 7 day trading, with consideration that this would be opportune for the City of Mount Isa generally and reflect the regional service role of Mount Isa for the broader North West region and its capacity to cater to visitors. There was almost a divide between businesses that considered it would be opportune for them and their business if seven day trading was available in supporting the Mount Isa economy, however, there was also a concern that this would be challenging for smaller businesses that rely on the ability to differentiate themselves based on trading hours.

The following compares Google’s “popular times” at the Foodworks in East Street between Tuesday and Sundays and the Foodworks in Pamela Street highlighting the popularity of these stores on Sundays as key to their overall trading activities:

East Street Foodworks



Foodworks – Pamela Street



Having regard to a number of the investigations of retail trading regulations in Queensland and nationally, Urban Economics notes the following conclusions:

“The committee was therefore unable to conclude how or to what extent the regulation of trading hours has impacted regional communities or the Queensland economy. The committee notes however that the interests of communities, retail businesses and all shoppers, including tourists, are best served by having consistent trading hours arrangements in regions across the state, as far as is practicable”⁴

There is currently no evidence that expanded trading hours fundamentally shift the demand/supply dynamic in Queensland retail, or retail elsewhere in Australia’⁵

⁴ Inquiry into the operation of the Trading (Allowable Hours) Act 1990 p.17

⁵ Ibid p. 19

Overall, we therefore consider that seven day trading for Mount Isa would be a key ingredient to transforming and diversifying the Mount Isa retail environment in contributing to the population servicing role of Mount Isa for the local and regional community as well as reinforcing the visitor functionality of Mount Isa as a true regional visitor centre catering to a breadth of visitor needs and amenities.

However, there may be more significant negative impacts on the micro and small business retail economy in the short term which suggest that as a renewal and diversification strategy for the SME pillar, this may not be the higher and better opportunity.

3.4 Childcare Centre

Based on Urban Economics's modelling and calculations, there is currently a demand for more than 600 places on a daily basis in Mount Isa. The current supply of places in Mount Isa is 235 across three centres with the closure of the St Paul's Lutheran centre in late 2023 and the Red Oasis centre currently closed according to Google maps.

The closure of the St Paul's Lutheran centre was cited as a result of significant challenges in costs of operation and securing the staffing required to operate the centre.

This would represent a crippling undersupply of places, with nominal occupancy rates of 239% across the LGA. With such a significant imbalance between the supply and demand for childcare places, the lack of sufficient facilities will clearly have an impact on local families, forcing many people (particularly mothers) to either reduce their working hours or forgo employment altogether due to the inability to find childcare for the days and times they need.

In order to return to a healthy rate of occupancy between 70-80% by the year 2031, at least an additional 494 childcare places would be required, representing roughly 4-5 new centres in Mount Isa. While this level of construction is unlikely to happen, there are certainly opportunities for new childcare development to take the pressure of existing centres and offer parents more choice.

We consider that a small to medium scale child care centre 70-90 places should be a priority project for Mount Isa in supporting the residential population and the needs of small and medium businesses, allowing for the need to secure staff and in monitoring overall confidence in the local market.

TABLE 3.2: Projected Demand for Childcare, Mount Isa LGA

Demand	2021	2023	2026	2031
Population	19,217	18,945	18,870	18,900
Proportion 0-4	8%	8%	8%	8%
ERP 0-4	1,542	1,520	1,510	1,512
Participation rate %	60%	60%	60%	60%
ERP 5 yrs (50% of cohort)	150	152	151	151
Participation rate %	20%	20%	20%	20%
Attendance p.w.	3.2	3.2	3.2	3.2
Demand for Places p.d.	611	603	599	600
Current Supply (Study Area)	235	235	235	235
Demand/Supply Gap	-376	-368	-364	-365

As part of the approved subdivision for the new Gliderport residential area, there is land identified for a future childcare centre along Mount Isa – Duchess Road, adjacent to a future neighbourhood centre and land for health and medical facilities.

FIGURE 3.2: Gliderport Masterplanned Development



Source: Mount Isa City Council

Given this intention for community development, Urban Economics believes that there is potential for a community hub style development, with childcare as the focus and other community uses co-located on site. This has been a growing recent trend in the childcare development industry, with many childcare providers seeking to locate inside or on the same site as shopping centres or co-locate with compatible uses such as swim schools. There is also potential to integrate the aforementioned business hub into this development instead of community uses, including co-working spaces or meeting rooms in conjunction with the library.

A potential template for this can be found in the Dampier Community Hub in the City of Karratha, Western Australia (pictured below). The community hub includes a Montessori Early Learning Centre, public library as well as meeting rooms and community spaces for local organisations such as ReachUs, which provide home maintenance services for those with medical issues. This project cost \$18 million and was funded in part by Rio Tinto (North West WA's largest Iron Ore operator), the WA State Government and the City of Karratha.



Source: City of Karratha

Other site investigation areas include colocation with the Hospital to support the needs of health workers.

3.5 RV and Caravan Park

Given its indigenous history, natural amenity and schedule of iconic events, Mount Isa has the attributes to become a notable tourist stop, offering travellers an experience of the outback. As one of the largest towns in the outback, it also has the potential to offer travellers the amenity and facilities that smaller towns may not have in supporting to the servicing, maintenance, catering needs of the drive visitor market.

The Barkly Highway into Mount Isa recorded an average daily traffic count of 1,278 vehicles in 2022, which has gradually increased over the previous 5 years since 2018, in which an average of 1,080 vehicles were recorded.

In attracting tourists to the region, there is potential to further develop Mount Isa's attractiveness as a destination for caravanners and motorhome owners, supporting the growth of the "big lap" market and those including self-contained adventure travel within their activities. There are three existing caravan parks in the region, with accommodation provided via cabins and villas at between \$120-140 and through on powered and unpowered sites from \$30-40 per night.

The Caravan and Motorhome Club of Australia (CMCA) is a membership base of some 66,000 individual members across Recreational Vehicle (RV) owners including motorhome, campervans and caravans, providing a range of advocacy, infrastructure and services to cater to the needs of members. One of the pillars of its member service is to recognise and promote to members towns, places, destinations and events that are particularly "RV-Friendly" – that is, making access to certain amenities as easy as possible for travellers and in turn promoting to its member base towns that offer an array of amenities and services that are tailored to the needs of RV owners and travellers.

The essential list of requirements for an RV Friendly Town or destination are listed below:

RV Friendly Town

- Provision of appropriate parking within the town centre, with access to a general shopping area for groceries and fresh produce.
- Provision of short term, low cost overnight parking (24/48 hours) for self-contained recreational vehicles, as close as possible to the CBD
- Access to potable water
- Access to a free dump point at an appropriate location

RV Friendly Destination

- Provision of short term, low cost overnight parking (24/48 hours) for self-contained recreational vehicles (RVs).

-
- Parking on a solid, level surface
 - A space with room for large vehicles to manoeuvre.
 - If the nominated site is for a campground then it needs to be well maintained and offer facilities such as BBQ area and covered seating etc

Towns in the surrounding region that have achieved RV-Friendly town status include Richmond, Julia Creek and Winton, whilst Mount Isa has not been added to the map and recognised as an RV friendly town or destination. It is recognised that there is parking available for RVs within the Mount Isa City Centre.

There are significant economic benefits that can be derived for local businesses and enterprises with an RV friendly town or destination status, encouraging members to plan their journey and routes based on these designations.

The CMCA has an active and engaged membership base, with the addition of any RV Friendly venues or towns advertised in the monthly digital magazine and word of mouth, and members are engaged in actively seeking affordable places to park and set up camp. The CMCA estimates that its members spend an average of \$100 each day they spend in a town, on groceries, fuel, essentials and meals out, a figure that will likely increase if they are able to spend less on the cost of parking and accommodation. Many members are also retired and living the RV lifestyle, meaning they are not always rushing from one destination to the next and are willing and able to stay for longer in certain towns that are welcoming.

By attracting more caravans and recreational vehicles to Mount Isa, there is also an opportunity for local mechanics and auto repair businesses to pivot their business into repairing recreational vehicles and caravans, building off the strong existing industry of repairing mining vehicles. Urban Economics has completed previous research in this area in Queensland and noted the willingness of recreational vehicle owners to travel long distances in order to have their vehicles repaired, going as far to travel interstate and detour off their preferred travel route to have their vehicles serviced by their favoured provider.

An expansion of the array of facilities and amenities that are particularly tailored to the RV and self-contained traveller market is recommended, including a selection of sites available on a more regular basis at the Buchanan Park Events Complex, home to the Mount Isa Race Club and where the famous Mount Isa Rodeo is hosted every August.

It is common in many towns for the main showground or racetrack to be used for self-contained camping and affordable camping for RVs and caravans outside of show season or race day, and during the rodeo, Buchanan Park already uses the inside of the racing track to accommodate powered and unpowered sites along with camping sites. As such, showers and toilets are already located on site and turning the site into an RV friendly destination would not require a significant amount of investment and does contribute to the upkeep and maintenance of infrastructure.

An onsite custodian for booking in of sites, check in of guests, basic maintenance and upkeep is required and can be offered through free site accommodation with power and water for a custodian on a temporary to medium term basis.

We would recommend discussions with the CMCA as to partner opportunities including investigation of a CMCA park in Mount Isa, the first phase of which could be the utilisation of Buchanan Park.

FIGURE 3.3: Buchanan Park Events Complex



Source: Nearmap

3.6 Shuttle Bus

North West Tours formerly trialed a shuttle service between the Airport and the City Centre but was impacted with COVID and the commuter systems employed by the mining organisations in transiting workers to accommodation facilities and worksites. It is recognised however, that there is no regular public transport network to connect visitors, workers and residents between key elements of the Mount Isa township but that a public transport network is unlikely to offer a viable or feasible network for the township without a subsidised operation in light of the size of the population base.

Connecting residents through to the City Centre and major event spaces and activities on a regular loop service that also incorporates the Airport including a timed stop at Buchanan Park RV Park and other caravan parks and accommodation facilities would facilitate funnelling visitors and residents to the City Centre and encourage expenditure at local retailers and food and dining outlets.

Like other corporate transit services such as Buffs Courtesy Bus, the former bus and rail commuter link between Metroplex on Gateway, Greenslopes Hospital's busway shuttle loop or Pacific Fair's Shopping Shuttle, these services are typically run as a free regular loop service around key public transport timetables and to and from key points of interest or major accommodation facilities.

This would need to be a subsidised community service potentially in partnership with an existing tour, club or bus service to utilise existing infrastructure and drivers, with economic and community benefits including:

- Improved accessibility
- Improved convenience
- Improved awareness of local facilities and businesses
- Promotion of events and activities
- Cross promotion of businesses, clubs, dining and retailing facilities
- Retaining expenditure within Mount Isa
- Encouraging visitors to stay longer within the area

3.7 Motorsport Precinct

Ernst and Young (EY) prepared the global study on four-wheeled motorsport together with the FIA and Motorsport Australia, Karting Australia and the Australian National Drag Racing Association (ANDRA). Locally, it was found that the motorsport industry provides \$3.1 billion in direct output, while providing \$5.5 billion of indirect output based on pre-COVID figures.

The industry also supported 16,900 direct jobs and a further 29,900 indirect jobs in 2019, the year the study was based on. The sport also enjoyed support from approximately 18,900 unpaid officials and volunteers, representing a total workforce of 65,700.

The EY report also identified that approximately 20% of participants, gross output and value added of the motorsport sector was attributable to Queensland, representing more than 38,000 participants and \$834.4 million of contribution to national GDP.

Council in the past has identified the desire for a local motorsport industry, in 2021 appointing an advisory panel to guide the development of a motorsports precinct. In December 2023, engineers GHD presented to council a feasibility study, taking into account various options for the construction of a motorsport precinct at Moondarra Dr, 10km north of Mount Isa city.

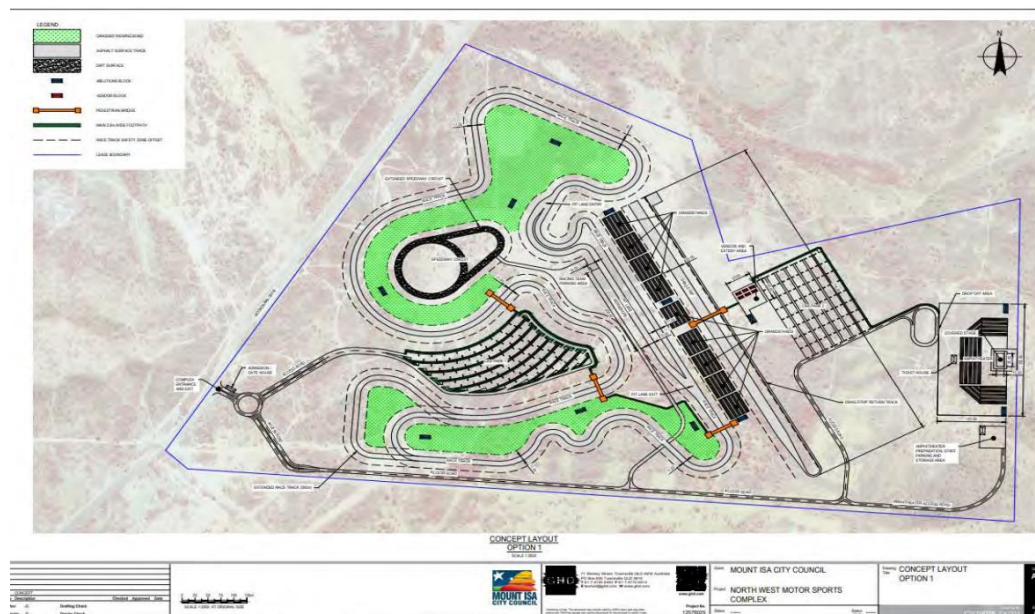
The initial concept plans include:

- Main car and bike racing dirt track, 4km in length with potential to upgrade depending on demand
- Drag racing straight of 900m with grandstand
- Concert area with seating, dependent on demand and financial viability
- Site access, parking
- Dirt track for Speedway and Motocross
- Food and drink facility area
- First aid facility

Additional potential uses that have been identified include community markets in the car park, use for car clubs and emergency services training.

The cost of the entire project is estimated at \$55 million, but options analyses have been prepared for some elements as standalone projects, with the caveat being that enabling infrastructure would be around two-thirds cheaper if constructed all at once.

FIGURE 3.4: North West Motor Sports Complex Concept Layout



Source: Mount Isa Council, GHD

Given the significant upfront cost of this project, Urban Economics believes that smaller scale options present a greater value for money initially, with the potential to further expand based on their success. The former Mount Isa speedway has been repurposed into grounds for the Mount Isa campdraft but still retains the go kart track next door and would represent an option to establish a low-cost speedway track capable of hosting local and regional events as a first stage, ramp up to test the market and re-engage interest and investment in motorsport in Mount Isa.

Key performance indicators for the speedway racing sector in Queensland are outlined below, with Speedway Australia having highlighted in 2023 that there has been strong growth nationally in the number of licenses held by speedway participants, including drivers, mechanical/pit crew technicians, officials and volunteers. Other key trends and underlying demand drivers include:

- 16 operational speedway venues in Qld;
- Speedway Australia lists 57 registered speedway clubs in Qld;
- Estimated to be 2,600 participants in Qld ≈ 45/club or 160/track;
- SA estimates that typical speedway events attract ~2,500 attendees;
- Participants surveyed by SA attend 12 events per year on average;

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- Typical speedway venue hosts 9 events per year, indicating mobility by participants between venues;
 - ~10% of competitors are juniors aged 5-19 of which ~30% are female;
 - Heightened participation in recreational motorsport in South Burnett c.f. other sports, including by children e.g. riding motorbikes and quadbikes on rural properties;
 - 48% of motorsport participants in Qld reside in regional areas (EY). *“The EY report found that 32% of the \$2.7b direct industry output was made up of tourism activity, and that 5,227 jobs were created nationally due to motorsport tourism.”*

A speedway and/or motorsport complex would represent a significant tourism opportunity for Mount Isa, given the propensity for speedway competitors and spectators to travel large distances both intra and interstate to compete in and watch events. Of the 10,000 estimated speedway competitors in Australia at various venues across the year, 85% are overnight visitors, with 65% having travelled from interstate to race at individual event. A typical speedway event attracts 2,500 spectators and contributes ~\$1.3 million to the local economy through the spending of competitors on mechanics and repairs as well as accommodation and food in nearby towns.

More particularly, the addition of a speedway also offers opportunities for a segment of those businesses impacted by the Glencore closure to diversify their businesses and expand their service offering, e.g. allowing those working in mine vehicle engineering or repair to pivot and also work on motorsport vehicles as well as other moto vehicles including RV and 4WDs. According to Speedway Australia, the average speedway competitor spends an average of \$16,000 per annum on their vehicles. Assuming a local speedway club of only 50 members, this represents a minimum of \$800,000 of business for local firms, with the potential to also service travelling competitors on race weekends.

The closure in 2023 of Queensland’s premier speedway at Archerfield in Brisbane has created a need for regional circuits to fill the local calendar, with nearby large circuits such as Toowoomba hosting many of the previous large events, with an opportunity for regional tracks to take on smaller events.

There will need to be dedication to a number of events as well as practice sessions, across a broad range of demographics and age groups including juniors to optimise the viability of the investment in the tracks and the sport generally for Mount Isa, to encourage visitation from a broader area than the local community and to have a real impact on the business operations and activities of local engineering firms to benefit from the motorsport industry.

3.8 Other Industries

Modular Housing

With consistently high demand thanks to interstate and international migration numbers and a supply-side that has fallen short of meeting demand for housing, Queensland has been struggling to adequately provide housing stock, amplified by rising costs of both material and labour inputs.

Modular homes can be fabricated in a single location, before being shipped off to locations when required to meet local demand for housing. The Queensland Government's Modern Methods of Construction (MMC) program has been designed to produce housing at a rapid rate, through high-volume repeat manufacturing. As part of the program, Rapid Accommodation and Apprentice Centres (RAAC) have been established in Brisbane and Cairns to provide housing and support apprentice training programs.



Modular Housing, Bundaberg

While there is a future RAAC opening in Cairns, the distance and high transport costs to Mount Isa may make the provision of housing there more expensive and difficult. With its strong industrial and trade workforce, Mount Isa would be an ideal location for another RAAC, with twofold benefits including the ability to train apprentices and provide genuine employment opportunities for young people and support the diversification potential for existing SME construction and engineering fabrication businesses.

Miner's Men's Shed

Upon meetings with council, Urban Economics noted that regardless of the redeployment and redundancy options offered to Glencore's Mount Isa employees, there is likely to a share of the 1,200 current employees who would choose to stay in Mount Isa due to their long service and established networks in the area.

Given many staying will also be closer to retirement, there is a need to harness their skills whilst also keeping them active in the community. A "Miner's Men's Shed" in town would offer retired miners the ability to continue using their skills whilst ensuring they retain a level of social contact. It could also offer an opportunity for youth and young adults to gain experience and mentorship from older, established members of the community – thereby improving their employment prospects.

This is not necessarily a diversification opportunity for existing SME businesses, but can be operated as an affordable maker space or creative start-up space for workers and those semi-retired to set up and operate businesses, work on products and test markets. Utilising existing skill sets and interests of workers and establishing a mix of new sole enterprise and micro businesses.

3.9 Medical Centre

There has been a clear and pressing need for more GPs in the Mount Isa region, with numerous news articles and press coverage referring to the fact that outback regions and clinics struggle to attract doctors to relocate from South East Queensland and other coastal centres, even with generous salary packages.

Urban Economics identified 8 GPs that advertised as being available for appointments in Mount Isa, but this may be an overestimate of the ability to access appointments in town, as some may work part time or websites have not been recently updated. Based on the average number of doctors per 100,000 for rural and remote areas, there is a demand for 20 full time GPs in medical centres across the LGA indicative of a localised gap in the provision of GP services relative to the regional population base of Mount Isa. More particularly, the consultation typically identified a three week waiting period to access a GP for a general medical appointment, again indicative that there is a gap in the population servicing economy within Mount Isa and opportunities for the SME sector

This undersupply of medical professionals is common across all specialisations in Mount Isa, with the threshold analysis identifying a gap in the service provision of health care and allied health care professionals.

With the high costs of travel to nearby regional centres such as Cairns, Townsville and South East Queensland, it is very difficult for locals to look outside the region for medical treatment, potentially exacerbating the health conditions for locals who are simply unable to access suitable care.

The master planned Gliderport subdivision also includes a potential site within the masterplan for medical and healthcare facilities. It is also noted that JCU has a significant partnership with the Hospital and a focus on regional, remote and indigenous health, with practical experience for students. There are innovative pathways and opportunities for the State to explore a new community health centre associated with the university and hospital in improving accessibility to general practice medicine and health care for the Mount Isa and regional community.

A medical centre with allied health services in the order of 500sqm to 1,000sqm is therefore recommended as a strategic priority project for Mount Isa, including pharmacy.

3.10 Resource Centre of Excellence For New Economy Minerals

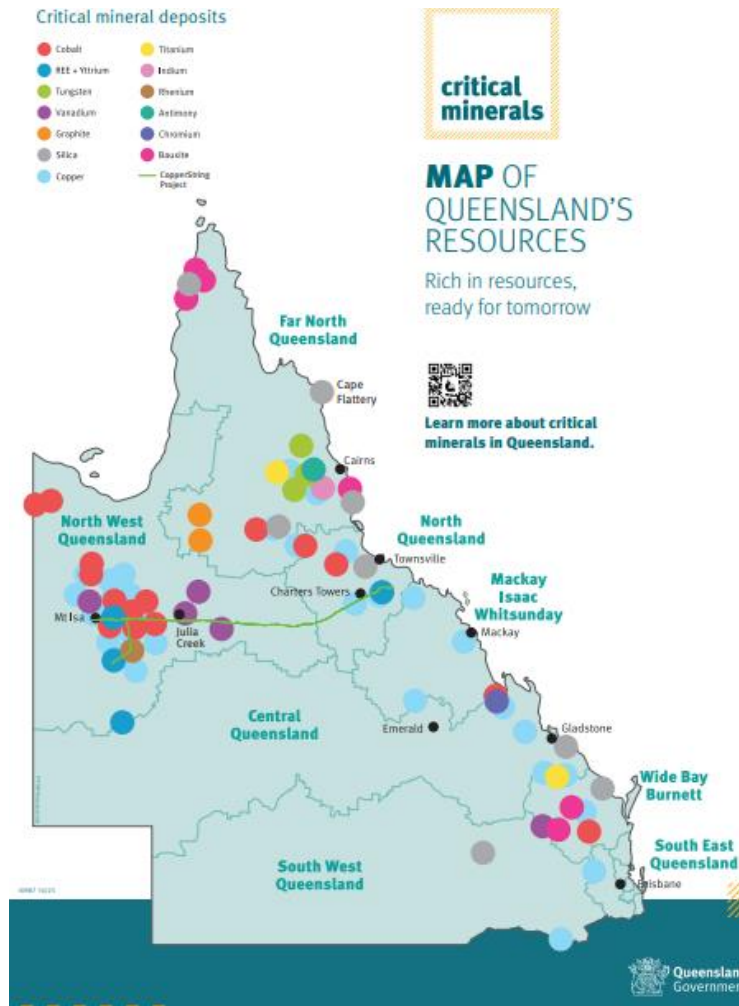
Mount Isa training and business centre for mining excellence and opportunities for RTO's to support the needs of displaced workers as they need to upskill and for businesses to access the training they need for workers.

The Resources Centre of Excellence in Paget is a clear example of the nature of industry and government collaboration that should be delivered in Mount Isa, building on the breadth of experience, the capacity to deliver real world training and research spaces and testing facilities effectively on the ground and at the "face" of mining operations.

More particularly, a resources centre of excellence for Mount Isa will present opportunities for resource and mining sector SMEs in Mount Isa and the broader North West Queensland region to explore, test and network around potential projects, opportunities and new markets, whilst building on existing strengths and markets.

In 2022, the State Government announced \$5.7million in funding within the State Budget for the expansion of the Resources Centre of Excellence in Paget, with the second phase to focus on the development of a future industries development hub. With Mount Isa's more traditional mining focus but centrality to the critical mineral deposits, it would appear strategic for such a new industry development hub and its connection to critical minerals and new economy minerals to be established in Mount Isa to better service the new and establishing mining operators and more particularly the SMEs servicing the new economy minerals and mining sector. Retaining Paget as the specialist centre for coal mining and more traditional mining economies, but locating new economy infrastructure that would garner the transition of the Mount Isa mining economy to the new economy minerals.

The following FIGURE broadly illustrates the concentration of critical mineral deposits, as highlighted in the Environmental Scan Technical Paper and explored in more detail by other pillars, but from a SME perspective, highlights the geographical concentration proximate to Mount Isa and its connection to the vanadium processing plant for Townsville, rather than Mackay and the existing Resources Centre of Excellence.



4.0 ACTION PLAN & DELIVERABLES - Design

TABLE 4.1 summarises the key projects and anticipated responsibilities, delivery mechanisms and outcomes for SMEs building on the opportunities and gaps identified, other emerging potential projects expanding on vertical and horizontal linkages explored and consultation identified SME opportunities. Potential funding sources and requirements have also been identified in designing key projects and priorities.

Further consultation with local businesses has highlighted some challenges with access to funding particularly for Smaller enterprises under the State's Transition Fund and that the requirements and commitments for businesses to apply under this Fund have been excessive and more suited to larger scale medium and large scale enterprises with resources. Consideration of availing of a grant writing expert is strongly recommended to assist businesses to apply for future iterations of this and other grant and funding programs.

The next most critical project therefore is a business hub with concierge type service to assist businesses in understanding resources, networks and access to business planning, grant writing, financial advisory services.

Opportunity Theme	Project Opportunity	The Business Case for the SME Sector	Timeframe	Responsibility/delivery Mechanisms	Budget	Funding Source
Communicate to Accelerate	Mount Isa Newspaper	<p>North West Star is a weekly community based newspaper published on Thursdays with a monthly digital audience of 5,820. A weekly published and digital paper will considerably expand the potential for SME businesses and operators to:</p> <ul style="list-style-type: none"> • Market their business and activities • Increase their awareness of local activities, events and happenings within their business and residential community as input to their marketing and business plans • Increase understanding of local needs and challenges that could be addressed through business activities and events 	Immediate – project has commenced	Independent proponent but requires investment/startup funding. Recommended advertising support from Council. Business case to be presented	\$100,000 for one year guarantee operation, underpinned by advertising	Advertising revenue
Open for Business	Business Hub	<p>Affordable space and place for SMEs to access resources, networking support, collaboration spaces, meeting spaces and startup spaces. Recommend a membership base and hiring of rooms, including co-working spaces.</p> <p>Key benefits for SMEs:</p> <ul style="list-style-type: none"> • Access to government resources, channels, grants and funding • Access to mentoring and networking opportunities • Additional channels to display, distribute, promote & market goods and services • Access to additional creative and maker spaces • Event spaces for workshops 	Short	<p>Partnership opportunity between Council, State and Commerce North West</p> <p>Premises approximately 100sqm for initial startup phase, progressing to 200-300sqm with creator/maker spaces and meeting rooms.</p>	<p>\$1million</p> <p>Fit out for commercial premises</p> <p>Rent in CBD location for exposure and connectivity to SME commercial, tourism and retail tenancies</p>	Federal Grants

		<ul style="list-style-type: none"> • Startup and micro spaces • Access to grant writing assistance 				
	Resources Centre of Excellence – Critical Minerals	<p>Testing space, training centre, collaboration space, tenant space, laboratory spaces.</p> <p>Strategic in line with net zero targets and critical minerals exploration particular to new minerals.</p> <p>Opportunities for SMEs:</p> <ul style="list-style-type: none"> • Networking, collaboration and resource sharing • Affordable research and testing spaces • Access to laboratory spaces • Access to industry innovation and research • Access to training for staff • Upskilling for new economy/critical minerals exploration and servicing 	Medium	<p>Partnership between State, universities, TAFE, existing and emerging mining organisations, Council and Federal Government</p> <p>Premises in industry precinct.</p>	\$10million	Federal and State funding
Retail Renewal	Placemaking Strategies	<p>Activities, events, renewal to contribute to the vibrancy and vitality of the CBD for retail and commercial tenants, and encourage visitors to linger longer.</p> <p>Short Term</p> <ul style="list-style-type: none"> • Design and deliver a community art project in the CBD. • A community dog show • Roller-hockey game in a CBD carpark/free basketball or soccer clinic. • Youth activations • Instagram/social media spots • Car free day • Car rally and sausage sizzle <p>Medium Term</p> <ul style="list-style-type: none"> • Makers Market • Community Long Table Dinner 	Short to long term	<p>A town team is a positive and proactive organisation that works collaboratively with their local area to improve a place or area. There are currently 151 local Town Teams across Australia, New Zealand, the United Kingdom and Poland.</p> <p>The Town Team Movement website has several free resources to help a town team get established as well as how to guides and other resources. The organisation also provides consulting services for a fee.</p>	\$100,000 for hiring a town team manager/coordinator	

Visitor Centric	RV/Caravan Parking	<ul style="list-style-type: none"> Progressive dinner <p>Expand the capacity for regular camping at Buchanan Park, utilising existing powered and unpowered sites for those seeking more affordable camping options e.g. showgrounds.</p> <p>Potential for some “push-back” from existing caravan park operators, but opportunities for SMEs:</p> <ul style="list-style-type: none"> Diversification of the overnight visitor market and length of time and spend in Mount Isa Increased awareness of Mount Isa on the great lap/grey nomad route Opportunities for vehicle servicing/maintenance/repairs/truck & RV DIY wash Advocate for CMCA national rally in Mount Isa with the opportunity to attract at least 1,000 motorhomes and an average injection of \$2-\$2millioni to local economies. 	Short	Mount Isa Council CMCA	<p>Limited investment required. Need to present case to CMCA.</p> <p>Caretaker on site to manage bookings and check-ins. This can be supported through free site accommodation, power and water and not necessarily a paid position.</p>	None required.
	Lake Moondarra	<p>A clear jewel in the Mount Isa community and visitor crown, Lake Moondarra has considerable potential for SMEs to develop and expand new business ventures that would cater to a more diverse mix of local residents and visitors. Events have been successful and can be relaunched and expanded. SME opportunities could include:</p> <ul style="list-style-type: none"> Inflatable park Water sports hire Café, initially establishing as a monthly food truck market Camp ground – revitalise the former youth camp Sunset tours 	Short to medium	Explore options to acquire ownership from Water Board	Ongoing investment in development and masterplanning of the lake precinct	Future stages of Resources Community Infrastructure Fund (RCIF) opportunity

		<ul style="list-style-type: none"> Regular events hosted at the lake which can be catered by SMEs e.g. stalls, markets, food trucks, equipment hire etc. <p>Other options include:</p> <ul style="list-style-type: none"> Birdwatching trails Hiking/riding/4WD trails Selection e.g. 10 self-contained free camp sites 				
Caring for the Community	Childcare	<p>Benefits and opportunities for SMEs include:</p> <ul style="list-style-type: none"> Increased opportunity to attract workers Increased capacity for workers to seek additional days/hours <p>80 place centre is proposed, can be staged in terms of room openings to test market acceptance and demand, but will need to be built in one phase.</p>	Short	<p>There is infrastructure in place with two former centres but staffing will remain the challenge unless key worker initiatives are developed to assist in attracting and retaining childcare workers</p> <p>Mount Isa Council to work with former operators to explore partnership solutions to reopen.</p> <p>Under free-Kindy program for Queensland, State should be responsible for sourcing and providing staff.</p> <p>Queensland Health – opportunity for a childcare centre on the hospital grounds</p> <p>Cloncurry was awarded funding for expansion to 100 place childcare centre under RCIF</p>	<p>\$750,000 for new build but recommend utilising existing infrastructure as immediate and short term opportunity</p> <p>Cost will staffing and re-accreditation for re-purposing existing facility</p>	<p>In 2023 Education Department released the Community Childcare Fund Limited supply grant for priority areas including regions. Funds up to \$900,000 were available for capital works, staffing, business planning. Only 3 centre based day cares were awarded in Qld including Banana which demonstrates significant childcare challenges comparable to Mt Isa. Strongly recommend watching for further opportunities for funding.</p>

	Medical Centre/Additional GPs and health services	Advocate for satellite health hub for Mount Isa. Life Flight and RFDS in 2021 and 2022 were awarded together \$11million from the Resources Community Infrastructure Fund for upgrading and expanding aeromedical bases and facilities in Mount Isa. Will support Mt Isa’s regional service role. Anticipated 43 FTE jobs supported. SME opportunities: <ul style="list-style-type: none">• Engineering businesses to support operations• Construction of new facilities• Maintenance and support	Medium Short	State Government Council, State and Federal Resource industry		RCIF and
	Shuttle Service	With the State reducing funding for existing public transport across the State to 50c, there is a strong potential to subsidise communities without dedicated public transport as part of this program. Advocate to the State as immediate delivery mechanism. SME opportunities: <ul style="list-style-type: none">• Delivery of shuttle service• Improved access for residential and visitor communities to CBD, retail, commercial, recreational, hospitality, tourism and entertainment operators	Short	Council and State Government Partner opportunities with local tour bus operators to be explored.	TBD and tested with shuttle bus operator Recommend feasibility study be undertaken in Phase 2	Growing Regions Program – round 2 will open in 2024
Creatives and Makers	Spinifex Paper Cloncurry expansion proposal – outside Mount Isa, but anticipates utilisation of	Expand to include print/sew indigenous fashion on a commercial scale, and produce in Australia not overseas. Potential to support 30 local indigenous artists and develop as a hub for production nationally rather than shipping overseas for	Immediate-Short	Kalkadoon community in Cloncurry but requires potential freight delivery that may contribute to supporting Council’s transport and logistics hub	Further information yet to be provided as to requirements Anticipate Phase 2 component in terms of delivery and	Indigenous Visual Arts Industry Support program – funding 2025/26 not yet open

	freighting from Mount Isa	<p>production. Requires investment in new sewing machinery. Has potential to work in with September indigenous fashion show and future expansion as a major event.</p> <p>Include gallery space to display and retail artworks. Recommend also display at Outback at Isa or new Indigenous Gallery in Mount Isa as regional hub to display and retail works.</p> <p>SME opportunities:</p> <ul style="list-style-type: none"> • Growth for the Kalkadoon artists potential to support some 30 artists • Opportunities for regional artists and fashion artists • Regional hub for indigenous art production • New indigenous gallery/visitor centre with flow-on to other tourist and visitor experiences • Freight distribution 		Mount Isa Council work with Cloncurry Council	<p>funding requirements. EG. 10 commercial sewing machines may require \$6,500 for mid level machines, but requires more consultation as to requirements.</p>	First Nations Arts Business Grants – currently open \$10,000
	Miners Men’s Shed	<p>Opportunities to build on the existing local men’s shed offering potential for mine workers to create and sell mine related products, personal equipment, including souvenirs. Re-employment of semi-retired and outgoing workers from the underground mine yet to be deployed. Opportunity for creation of micro and solo businesses.</p>	Immediate	<p>Potential to share Men’s Shed space</p> <p>May require investigation of other equipment for consultation with members</p>	Australian Men’s Shed Association	National Shed Development Program
Motorsport Haven	Motorsport precinct	<p>Staged development of the motorsport precinct with opportunities to incorporate a range of events, motorsports and interests</p>	Medium	<p>Mount Isa Council</p> <p>Motorsport and Recreation Inc.</p>	<p>Masterplan report recommendations. Staging strongly recommended. Drag track/speedway</p>	<p>Supercheap Auto Club Development Fund in association with</p>

	<p>for different demographics and enthusiasts.</p> <p>Opportunities for SMEs to:</p> <ul style="list-style-type: none">• Support construction and development of racetracks and associated facilities• Provide maintenance, repairs and engineering services for vehicles and clubs• Equipment and supplies including hire• Catering and amenities for events	<p>opportunity imminent opportunity.</p>	<p>Motorsport Australia</p> <p>Growing Regions Program – round 2 will open in 2024</p>
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