



MT CARBINE BANKABLE FEASIBILITY STUDY

CHAPTER 14: RISK AND OPPORTUNITY

DECEMBER 2021



Document History

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1. Introduction

1.1. Context

This Chapter 14: Risk and Opportunity shall be read in conjunction with Chapter 1: Executive Summary.

1.2. Purpose

The effective management of risks and opportunities is essential to the successful development and execution of the Mt Carbine Upgrade Project. The purpose of Chapter 14: Risk and Opportunity is to define the framework which will:

- Describe the process for identifying risks and opportunities that could impact the Project;
- Describe the process for assessing risks using consistent risk management guidelines;
- Identify and assess the material risks associated with Project execution, and define appropriate measures to control these risks;
- Establish a process to ensure that risks and opportunities continue to be identified and compliance obligations satisfied throughout the life of the Project; and
- Ensure that the process is communicated to all relevant project stakeholders.

2. Risk and Opportunity

2.1. Scope

The risk management activities which have been and will continue to be carried out with regard to developing the Project include:

- Completion of initial Project risk assessments and identification;
- Establishment of the Project Risk & Opportunity Register;
- Identification of Project related compliance obligations, including any risks of non-compliance; and
- Ongoing management of risks, compliance obligations and actions.

2.2. Risk Assessment Process

The risk assessment process has to date and will in future continue to involve desktop reviews, interviews with key EQR personnel and stakeholders, and subject specific workshops. The consolidated product of that assessment process is presented to the EQR management team to validate.

All risks are captured in the Project Risk & Opportunity Register.

Risk management involves identification, assessment and management of risks and opportunities with the ability to impact on:

- Health and Safety
- Security
- Natural environment
- Assets
- Project cost / schedule
- Schedule / production
- Project return
- Compliance / governance
- Community
- Reputation
- Shareholder value

2.3. Risk Identification and Assessment

A facilitated risk identification and assessment process was conducted involving the personnel listed in Table 1.

Table 1: Risk Assessment Attendees

Name	Company
Peter Jukes	JukesTodd (Study Manager)
Cameron Bain	Mincore
Steve Jukes	JukesTodd (Study Sponsor)
Kevin MacNeill	EQ Resources

Name	Company
Ryan MacNeill	CRONIMET Australia
Shane Leary	DAS Mining Solutions
Tim Anderson	NRA Environmental
Paul Leach	JukesTodd (Facilitator)

Identified risks were assessed against the EQR Risk Matrix which is detailed in Table 2,

Table 3 and Table 4.

Table 2: Consequence Matrix

	Insignificant	Minor	Moderate	Major	Severe
Safety	first aid or minor medical treatment	Medium term, largely reversible injury or illness to one or more persons; restricted work injury; LTI < 2 weeks	serious bodily injury or illness and/or LTI > 2 weeks to one or more persons	Severe irreversible disability (permanent disabling injury) or illness to one or more persons	Fatality; significant, irreversible disability (permanent disabling injury) or illness to 10's of people
Environmental	incident has caused negligible environmental impact requiring very minor remediation	incident has caused minor reversible environmental impact requiring minor remediation	incident has caused moderate reversible environmental impact with short term effect requiring moderate remediation	Incident has caused serious environmental impact with medium term effect requiring significant remediation	Incident has caused disastrous environmental impact with long term effect requiring major remediation
Production	Little impact on quality and/or quantity of product.	Minor impact on quality and/or quantity with minor rectification cost.	Moderate impact on quality and/or quantity that is rectifiable and managed	Major impact on quality and/or quantity with high rectifiable cost.	Severe impact on product quality and/or quantity with reduced viability for sales.
Financial	Financial impact less than \$10K.	Financial impact less than \$50K, more than \$10K.	Financial impact less than \$200K, more than \$50k.	Financial impact less than \$1M, more than \$200K.	Financial impact more than \$1M.
Reputation / Community	No media coverage. No community complaints.	local media coverage. Complaint to site, and/or regulator.	Local media coverage over several days. Negative impact on local community. Persistent community complaints.	Negative media coverage (including social media) over several days. Significant negative impact on share price for weeks.	Prominent negative media (including social media) coverage over several days. Significant negative impact on share price for months.

	Insignificant	Minor	Moderate	Major	Severe
Legal (Contractual or Compliance)	Legal issues (regulatory or contractual) that may be rectified with little or no impact on business.	Legal issues (regulatory or contractual) that trigger investigation or report to authorities with prosecution/litigation possible.	Breach of legislation having a 'moderate' financial impact (see above). Significant contractual dispute or litigation involving many weeks of senior management time.	Litigation /breach having a 'major' financial impact (see above). Investigation by regulatory body resulting in long-term interruption to operations. Possible jail sentence for directors/ senior managers.	Significant litigation or prosecution with damages having a 'severe' financial impact (see above). Jail sentence for directors/ senior managers. Prolonged closure of operations.

Table 3: Likelihood Matrix

Rare	Unlikely	Possible	Likely	Almost Certain
Conceivable, but only in extreme circumstances. Very unlikely to occur during the life of an operation / project. Relatively unknown in industry or setting. <0.1%	Hasn't happened yet but could. Unlikely to occur during the life of an operation / project. Few instances in industry or setting. 0.1% - 10%	Could happen and has occurred at our operation or others. May occur during the life of an operation / project. 10% - 50%	Could easily happen every few years. Could easily occur during the lifetime of an operation / project. 50% - 85%	Could happen several times a year. Could be expected to occur more than once during the lifetime of a project / operation. 85% - 99%

Table 4: Probability and Impact Diagram

			Likelihood				
			1	2	3	4	5
			Rare	Unlikely	Possible	Likely	Almost Certain
Consequence	5	Severe	11 Moderate	16 High	20 High	23 Extreme	25 Extreme
	4	Major	7 Moderate	12 Moderate	17 High	21 High	24 Extreme
	3	Moderate	4 Low	8 Moderate	13 Moderate	18 High	22 High
	2	Minor	2 Low	5 Low	9 Moderate	14 Moderate	19 High
	1	Insignificant	1 Low	3 Low	6 Low	10 Moderate	15 Moderate

2.4. Risks

The key risks identified during the study are summarised in Table 5.

Table 5: Key Risks

Risk ID	Risk	Cause	Impact	Current Controls	Current Rating
2	HV / LV interaction	Poor traffic management Fatigue	Injury, vehicle damage	Installation of berms on the haul road (divided road) LV to have separate roads Radio protocols Fatigue Management Plan	High
5	Noise and dust pollution	High silica content in dust Older equipment First crusher (rock) screen has no dust control	Health impact on site personnel Impact on neighbours (town)	Water trucks Water added to crusher PPE Wet screen being added to crusher Good stakeholder communications	High
7	Loss of production	Poor mining productivity Wet season impact	Failure to achieve financial targets	Mine planning Redundancy in mining equipment Addition of wet screening Increased equipment sizing	High
10	HV / LV accident on the Mulligan Highway crossing	No controls on the road HV operator not stopping before crossing highway	Fatality	Traffic speed control on both sides of the highway installed. Phase 1 design includes slurry of fines to reduce number of crossings required.	High
11	Personal injury	Heavy equipment impacting on OH HV power lines Increased site traffic Energy sources - electrical, air, hydraulic	Fatality	High vis signage around electrical equipment Operators trained in lockout / tagout procedures	High
15	Increased rehabilitation obligations	Application for new EA due to increased production plan	Delays in approvals Increased ERC bonding	Maintaining current disturbance footprints under both EAs	High
17	Pit retains mine affected water at the time of commencing the cutback	Big wet season	Delay in commencement of mining	Current dewatering process, readily escalated in need	High
20	Unknown pit stability on completion of dewatering and on cut into South Wall Fault	Unknown deterioration of rock face and geotechnical conditions	Potential safety incidents Pit wall failure	Plan for detailed geotech assessment before introduction of people and equipment into the pit. Conservative rock bolting and face stability design included in operating costs.	High
22	Blasting impact on local community	Proximity to local community Location of magazine	Fly rock, dust, fumes, vibrations, etc Delays in approvals	Comprehensive Blast Management Plan to be developed, following detailed risk assessment	High
25	Waste rock may prove to not meet quarry rock spec	Higher sulphate	Additional areas required to separate mine waste from quarry waste rock Increased ERC	Planned geochemistry testwork and geological testing to ensure compliance with licensing requirements	High

Risk ID	Risk	Cause	Impact	Current Controls	Current Rating
26	Beneficial reuse comes into question	Policy change	Increased ERC	Received written direction from the State	High

A number of Medium and Low Risks have also been identified and included in the Project Risk Register and will be carried forward for consideration during subsequent stages of the Project. The Project Risk Register is a dynamic document, revised as appropriate to reflect changes as the project develops.

The key opportunities identified during the study are summarised in Table 6.

Table 6: Key Opportunities

Risk ID	Risk	Cause	Impact	Current Controls	Current Rating
29	Increased quarry revenue	Increased marketing By-products from process plant Large volumes of quarry inventory	Increase production revenue	Testwork and R&D under way - suitable for road construction materials EOIs released	Significant
32	Potential reduction in the cost of funding	Potential NAIF and the Critical Minerals Fund	Lowest interest rate on debt	Meeting with Critical Minerals Facilitation Office planned for early October NAIF application process underway	Significant
35	Additional resource identification	Current cut off grade of resource model is 0.2%, changing cut off grade to 0.7% for a low grade feed similar to LGS could increase revenue and ore significantly	Increase in resource quantity and overall tungsten production from open pit	Plan to redo resource model with additional drill data to be obtained early 2022	Significant
37	Favourable geotechnical conditions on South Wall Fault found during future geotechnical investigation	A rock wall stabilising cost has been included in the operating estimate. Future geotechnical data may indicate a lower level of reinforcement is required to maintain wall stability.	Operating cost savings for pit wall stabilising.	A conservative design and costing is in place in the event that significant reinforcement is required.	Significant

A number of Medium and High Opportunities have also been identified and included in the Project Risk Register and will be carried forward for consideration during subsequent stages of the Project

The Project Risk Register is included in Appendix A.

3. List of Abbreviations

Abbreviation	Description
EA	Environmental Authority
EOI	Expression of interest
EQR	EQ Resources Limited
ERC	Estimated Rehabilitation Cost
HV	High voltage
LGS	Low grade stockpile
LTI	Lost time injury
LV	Low voltage
NAIF	Northern Australia Infrastructure Facility
OH	Overhead
PPE	Personal protective equipment
R&D	Research and development

Appendix A Project Risk & Opportunity Register

EQ RESOURCES

MT CARBINE UPGRADE PROJECT

RISK REGISTER



Risk ID	Type	Risk	Cause	Impact	Current Controls	Current Score		
						Consequence	Likelihood	Rating
1	Risk	Geotech failure of the dig face	Oversize particle size in the low grade stockpile Oversize particle hangup, clay	Bench failure	Bench heights limited to 3 metres	Major	Unlikely	Medium
2	Risk	HV / LV interaction	Poor traffic management Fatigue	Injury, vehicle damage	Installation of berms on the haul road (divided road) LV to have separate roads Radio protocols Fatigue Management Plan	Critical	Possible	High
3	Risk	Vehicle accident	Adverse weather	Erosion, storm water flooding,	SOP	Moderate	Possible	Medium
4	Risk	Vehicle accident	Handling oversize material	Truck damage, operator injury	SOP	Moderate	Possible	Medium
5	Risk	Noise and dust pollution	High silica content in dust Older equipment First crusher (rock) screen has no dust control	Health impact on site personnel Impact on neighbours (town)	Water trucks Water added to crusher PPE Wet screen being added to crusher Good stakeholder communications	Major	Possible	High
6	Risk	Incidents at night	Poor area lighting	Injury, equipment damage	Plan to purchase additional mobile lighting towers	Moderate	Possible	Medium
7	Risk	Loss of production	Poor mining productivity Wet season impact	Failure to achieve financial targets	Mine planning Redundancy in mining equipment Addition of wet screening Increased equipment sizing	Critical	Possible	High
8	Risk	Entanglement risk	Rotating equipment / conveyors	Personal injury	Guarding in place Pull wires on conveyors	Major	Unlikely	Medium
9	Risk	Radiation risk	X-ray sorter	Radiation sickness	Trained radiation officer on site Personnel wear geiger counters Equipment contained within lead enclosure	Major	Rare	Medium
10	Risk	HV / LV accident on the Mulligan Highway crossing	No controls on the road HV operator not stopping before crossing highway	Fatality	Traffic speed control on both sides of the highway installed. Phase 1 design includes slurry of fines to reduce number of crossings required.	Critical	Possible	High
11	Risk	Personal injury	Heavy equipment impacting on OH HV power lines Increased site traffic Energy sources - electrical, air, hydraulic	Fatality	High vis signage around electrical equipment Operators trained in lockout / tagout procedures	Critical	Unlikely	High
12	Risk	Breakdown in relationship with landholder	Unplanned release of contaminated water / hazardous material Weed infestation within neighbouring land	Dispute Complaints	Current verbal communications Development and implementation of Stakeholder Management Strategy	Moderate	Unlikely	Medium
13	Risk	Surface and ground water pollution	Existing mine disturbances (TSF, pit, WRDs) Stormwater runoff	Deterioration of water quality Non-compliance Significant cost of rectification	Monitoring & current hydro investigation Water management plan	Major	Unlikely	Medium
14	Risk	Material compliance breach	Non-compliance with 2 EAs Limited resources	Impact on production, regulatory fines	Management plans in place	Moderate	Possible	Medium
15	Risk	Increased rehabilitation obligations	Application for new EA due to increased production plan	Delays in approvals Increased ERC bonding	Maintaining current disturbance footprints under both EAs	Major	Possible	High
16	Risk	Potential for unknown hazardous materials within existing footprint	Legacy operational waste	Increased ERC cost.	Maintaining current disturbance footprints under both EAs	Moderate	Rare	Low
17	Risk	Pit retains mine affected water at the time of commencing the cutback	Big wet season	Delay in commencement of mining	Current dewatering process, readily escalated in need	Critical	Possible	High
18	Risk	Water deficit affecting production	Overly successful pit dewatering effort	Impact on production	Building a water reserve in TSF4 High level of water recoveries from process plant Planned production bores	Major	Unlikely	Medium

Risk ID	Type	Risk	Cause	Impact	Current Controls	Current Score		
						Consequence	Likelihood	Rating
19	Risk	Availability of resources (including engineers, drillers, general labour)	Market Larger FIFO operations competing for people	Impact on production Potential safety risks with reduced skills and experience	Contract vs owner operator discussion in progress Resource planning	Moderate	Unlikely	Medium
20	Risk	Unknown pit stability on completion of dewatering and on cut into South Wall Fault	Unknown deterioration of rock face and geotechnical conditions	Potential safety incidents Pit wall failure	Plan for detailed geotech assessment before introduction of people and equipment into the pit. Conservative rock bolting and face stability design included in operating costs.	Critical	Unlikely	High
21	Risk	Mineral resource not as well defined as preferred	Planned mining method quite different to previous operation	Production loss	Ore sorters, geological knowledge	Moderate	Unlikely	Medium
22	Risk	Blasting impact on local community	Proximity to local community Location of magazine	Fly rock, dust, fumes, vibrations, etc Delays in approvals	Comprehensive Blast Management Plan to be developed, following detailed risk assessment	Major	Likely	High
23	Risk	Dust hazard	Vehicle movement, operating plant, blasting	Impact on local community Breach of compliance	Planned development of a Dust Management Plan	Moderate	Unlikely	Medium
24	Risk	Noise hazard	Vehicle movement, operating plant, blasting	Impact on local community Breach of compliance	Planned development of a Noise Management Plan	Moderate	Unlikely	Medium
25	Risk	Waste rock may prove to not meet quarry rock spec	Higher sulphate	Additional areas required to separate mine waste from quarry waste rock Increased ERC	Planned geochemistry testwork and geological testing to ensure compliance with licensing requirements	Critical	Unlikely	High
26	Risk	Beneficial reuse comes into question	Policy change	Increased ERC	Received written direction from the State Plan to maintain that outcome	Critical	Unlikely	High
27	Opportunity	Increased recovery	Plant process improvements Overly conservative assumptions Grade increase	Increase production revenue	Testwork program in place Ausenco engaged to improve recovery	Moderate	Possible	Medium
28	Opportunity	Conversion of inferred resource to ore	Potentially significant amount of pit shell which is currently not resource could prove to be ore	Increase production revenue	Planned further exploration drilling	Major	Likely	High
29	Opportunity	Increased quarry revenue	Increased marketing Byproducts from process plant Large volumes of quarry inventory	Increase production revenue	Testwork and R&D under way - suitable for road construction materials EOIs released	Critical	Likely	Significant
30	Opportunity	Government grants	R&D grants on offer	Increase production revenue	Grant applications submitted (eg \$3M application for smelting)	Critical	Possible	High
31	Opportunity	Reduction in OPEX	Increased automation	Increase production revenue	Ausenco currently undertaking study Program of continuous improvement in place	Critical	Possible	High
32	Opportunity	Potential reduction in the cost of funding	Potential NAIF and the Critical Minerals Fund	Lowest interest rate on debt	Meeting with Critical Minerals Facilitation Office planned for early October NAIF application process underway	Critical	Likely	Significant
33	Opportunity	Potential reduction in State license fees	Regulation - policy in place	Potentially \$1M over 10 years	Define process and proceed with application	Moderate	Likely	High
34	Risk	Reduction in process plant performance with plant modifications	Change to circuitry	Reduced recovery	Upgraded circuit has been designed to scavenge losses from current process so process losses are unlikely	Major	Unlikely	Medium
35	Opportunity	Additional resource identification	Current cut off grade of resource model is 0.2%, changing cut off grade to 0.7% for a low grade feed similar to LGS could increase revenue and ore significantly	Increase in resource quantity and overall tungsten production from open pit	Plan to redo resource model with additional drill data to be obtained early 2022	Critical	Likely	Significant
36	Risk	Lack of approval for slurry pipeline through existing culvert	DTMR refuses access to EQR to place pipe through existing culvert under Mulligan Highway	Alternate culvert construction required to allow crossing	Working with state government, will engage with DTMR when pipeline is designed.	Moderate	Possible	Medium

Risk ID	Type	Risk	Cause	Impact	Current Controls	Current Score		
						Consequence	Likelihood	Rating
37	Opportunity	Favourable geotechnical conditions on South Wall Fault found during future geotechnical investigation	A highly conservative rock wall stabilising cost has been included in the operating estimate. Future geotechnical data may indicate a lower level of reinforcement is required to maintain wall stability.	Operating cost savings for pit wall stabilising.	A conservative design and costing is in place in the event that significant reinforcement is required.	Critical	Likely	Significant

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