RESOURCES

MT CARBINE BANKABLE FEASIBILITY STUDY

CHAPTER 7: PROJECT EXECUTION

DECEMBER 2021

Document History

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1. Introduction

1.1. Context

This Chapter 7: Project Execution shall be read in conjunction with Chapter 1: Executive Summary and additional references as listed in Section 15.

1.2. Purpose

The purpose of Chapter 7: Project Execution is to define the strategy and process by which the Project will be executed and managed. The execution strategy includes the contracting and procurement methodology for the major packages and the systems and structure that will be established to ensure the Project is delivered successfully.

2. Project Objectives

The key objective of the study is to define and evaluate the activities required to sustainably mine the LGS and recommence mining activities at the existing open pit.

The execution of the Mt Carbine upgrade is comprised of three phases, the first two of which are part of this study. The inclusions for each phase are detailed in Section 3.

The key study goals and objectives include:

- Upgrade the crushing, screening and x-ray transmission (XRT) sorting plant to achieve a nominal 350tph throughput capacity;
- Modify the existing processing plant to achieve a nominal throughput of 60tph on a 24/7 and improved recovery to support the higher head grade ore supplied from the open pit mining activities;
- Achieve a sustainably profitable and cashflow generating operation processing only the LGS as quickly as possible (Phase 1);
- Develop a process by which all possible mine waste is repurposed as a secondary saleable quarry product;
- Continue to maintain positive relations with the surrounding community, neighbours, and stakeholders; and
- Develop a capital and operational expenditure budget in accordance with AACE Class 3 requirements.

3. Scope

3.1. Work Breakdown Structure

The Project's level 2 Work Breakdown Structure (WBS) is shown in Table 1. A more detailed WBS is attached as Appendix A.

Table 1: Work Breakdown Structure – Level 2

WBS Code	WBS Description
10000	MINING
11000	Mine Development (Open Cut)
12000	Mine Development (Underground)
13000	Mine Development (Mineralised Ore Stockpiles)
17000	Mobile Equipment
20000	PROCESSING
21000	Dry Processing
23000	Wet Processing
25000	Product Handling, Storage and Transportation
26000	Reject Handling, Storage and Transportation
30000	ON-SITE INFRASTRUCTURE
31000	Civil Infrastructure
32000	Surface Services and Utilities
33000	Underground Services and Utilities
34000	Mine Industrial Area and Mine Facilities
40000	OFF-SITE INFRASTRUCTURE
41000	Access Roads (off-site)
42000	Power Supply
43000	Water Supply
44000	Communications
70000	PROJECT INDIRECTS
71000	Construction Facilities
72000	Construction Support
73000	Construction Equipment, Tools and Supplies
74000	Material Transportation to Site
75000	Project Accommodation
76000	Contractor Labour Indirects

WBS Code	WBS Description
80000	OWNER'S COSTS
81000	Owner's Labour Costs
82000	Project Expenses
83000	Insurance, Duties, Taxes, etc.
90000	ESCALATION AND CONTINGENCY
91000	Escalation

3.2. Phase 1 Scope

The Project scope against the WBS is summarised below.

3.2.1. WBS 10000 – Mining

The scope for WBS 10000 – Mining includes:

WBS 17000 – Mobile Equipment

The purchase of mobile equipment to augment the existing mining fleet and support the increased production of the operations. The mining fleet to be purchased is listed below:

- Hyundai 980 Front End Loader (purchased);
- 3 x Bell B50E ADTs (purchased);
- Cat D6 Bulldozer (purchased);
- Kobelco SK500 50t Excavator (purchased);
- Komatsu WA500 Front End Loader; and
- Bobcat.

The scope for the mining activities is further detailed in Chapter 4: Mining.

3.2.2. WBS 20000 – Processing

The scope for WBS 20000 – Processing includes:

WBS 21000 – Crushing Plant

The existing crushing plant will be upgraded to allow a consistent feed rate of 170tph of -170mm material. This will be achieved primarily through:

- Removing the jaw crusher from the circuit;
- Feeding all material through the recently acquired mobile rock screen;
- Replacing the existing rock screen underflow dry screen with a wet screen;
- Pumping wet screen underflow (-6mm) directly to the gravity processing plant;
- Introduction of a dewatering system for the -6mm material not fed directly to the gravity processing plant; and
- Installation of new conveyors to support the upgraded layout.

WBS 22000 – XRT Sorting Plant

The XRT sorting plant circuit will be upgraded to support the consistent 170tph crushing plant feed rate. The upgrade to the sorting plant consists of:

- Installation of a second XRT ore sorter;
- Relocation of the XRT sorting crushing system to be adjacent to the processing plant
- Replacement of the existing cone crusher with a vertical shaft impact (VSI) crusher; and
- Replacement of the existing dry screen with a larger screen.

The scope for the crushing plant and XRT sorting plant upgrades is detailed further in Chapter 5: Processing.

WBS 23000 – Wet Processing

The existing gravity processing plant will be upgraded to sustainably operate at 60tph on a 24-hour basis. This will be achieved through:

- Replacement of high wearing and underperforming pumps to a suitable size;
- Installation of a second rolls crusher adjacent to the existing rolls crusher;
- Installation of a control room for the process control system server storage and plant operation terminal; and
- Replacement of the existing SCADA control panel which is at end of life.

The scope for the crushing plant, XRT sorting plant and processing plant upgrades is detailed further in Chapter 5: Processing.

3.2.3. WBS 30000 – On-site Infrastructure

The scope for WBS 30000 – On-site Infrastructure includes:

WBS 32100 – Power Supply and Distribution

The additional crushing and screening equipment requires an increase to the existing power requirements. This will be achieved through:

- Modifications to the existing 22kV powerlines on the site; and
- Installation of a new 500kVA pole mounted substation.

WBS 32200 – Water Services

The introduction of wet screening to the crushing and screening plant requires the supply of water. This will be achieved through:

- A feedpipe from the open pit to a dedicated raw water tank at the crushing and screening plant.

WBS 34000 – Mine Industrial Area and Mine Facilities

Additional mine facilities will be installed to support the increased operational requirements. The new mine facilities that will be installed include:

- Containerised electrical workshop and storeroom; and
- Containerised storeroom for crushing and screening tools and spares.

The scope for the on-site infrastructure is detailed further in Chapter 6: Infrastructure.

3.3. Phase 2 Scope

The Project scope against the WBS is summarised below.

3.3.1. WBS 10000 – Mining

The scope for WBS 10000 – Mining includes:

WBS 10000 - Mining

The mobilisation and commencement of pre-stripping activities is included as part of the Project. The first month of mining operations is included as part of the Project capital. The early access to high grade ore on the pit face and floor, combined with ongoing revenue from the mining of the LGS negate the requirements for an extended period of mining to be capitalised under the Project.

3.3.2. WBS 20000 – Processing

The scope for WBS 20000 – Processing includes:

WBS 21000 – Crushing Plant

A new standalone crushing plant will be constructed to handle a consistent feed rate of 350tph of ROM material. This will then be screened and sized to a -40+6mm material for feed to the XRT ore sorters and a -6mm material that will be slurry pumped to the gravity processing plant.

The slurry material will feed to a surge tank that will pump feed the gravity processing plant. Excess feed will be dewatered and stacked for dry feeding into the gravity processing plant.

WBS 22000 – Sorting Plant

The existing XRT sorters will be relocated onto new structures incorporated into the new crushing, screening and XRT sorting circuit.

The XRT sorter feed material will be reclaimed from stockpile via reclaim conveyor and sorted into product and reject stockpiles.

WBS 23000 – Wet Processing

The existing gravity processing plant will maintain its Phase 1 throughput of 60tph. The plant will be upgraded to improve recovery to support the higher head grade feed achieved from introduction of high-grade ore from the open pit.

The increased recovery and other process improvements will be achieved through:

- Jig duplication and spilt of jig feed size fractions to coarse and fine;
- Introduction of a scavenging circuit after the primary jigs;
- Installation of additional tables to support additional product recovery;
- Arsenic removal; and
- Concentrate drying and product separation (wolframite and scheelite).

WBS 26000 – Reject Handling, Storage and Transportation

The gravity processing plant reject system will be upgraded to separate and dewater the plant rejects into two distinct quarry products. This will be achieved by:

- Installation of a high frequency screen to split the processing plant rejects at the 250µm size fraction; and
- Installation of a dewatering cyclone and containment cells to dewater the -250µm material and return the process water to the plant.

The scope for the activities in WBS20000 is detailed further in Chapter 5: Processing.

3.3.3. WBS 30000 – On-site Infrastructure

The scope for WBS 30000 – On-site Infrastructure includes:

WBS 32200 – Water Services

The mine requires a source of raw water once the open pit is dewatered. This will be achieved through:

- Installation of a water production bore that supplies water to the clean water dam as top up raw water.

WBS 32500 – Communications

The introduction of additional mining services and facilities increases the radio communications requirements for the site. These will be upgraded to support the operations.

WBS 34000 – Mine Industrial Area and Mine Facilities

The mine facilities will be upgraded to support the needs of the operations. The upgrades include:

- Minor upgrades to the site security facilities and signage;
- Installation of a mining contractor offices, workshop and storeroom;
- Installation of a new core shed and equipment; and
- Modifications to the existing site offices and lab buildings.

4. Project Delivery

4.1. Staged Delivery Strategy

The Mt Carbine Upgrade Project will be delivered using a staged approach with the scope split into three phases as summarised below:

Phase 1 shall focus on minimal capex, incremental improvements to increase the mine's productivity and profitability focusing solely on the mining and processing of the LGS.

Phase 2 will focus on the activities and works required to dewater and commence mining of the open pit. The crushing and screening plant and gravity processing plant will be upgraded to further reduce operating costs and increase tungsten recovery.

Phase 3 (focus of future study) shall investigate the commencement of underground mining activities at Mt Carbine to allow the continuation of mining once the open pit resource is exhausted.

The justification for the staged approach is driven by multiple factors as described below.

Current Operations

The current operations based on small scale mining and processing volumes does not produce sufficient value. The requirement of Phase 1 is to quickly ramp up production to allow greater throughput and tungsten concentrate production to improve the opex costs to a sustainably profitable operation.

Approvals Timeframes

In consultation with NRA Environmental Consultants, providing environmental and approvals advice for the Project, it was advised that the Environmental Authority (EA) amendments should be handled in a staged process. The key amendments required for the Project are:

- EA EPML00956913 ERA 31 Mineral processing increase to allow for greater than 100,000tpa of processing plant throughput (Phase 1); and
- EA EPML00956913 Schedule 3 19 Mining change of mining methods to allow the recommencement of open pit mining (Phase 2).

The timing required for the amendments above lend themselves to a staged approach as there is significantly more time required to produce the necessary documentation to support the recommencement of open pit mining.

A staged approvals process allows for the necessary amendment to increase the gravity plant processing plant throughput and a path to sustainably profitable operations while the work for the open pit mining amendment is still ongoing.

The anticipated timeframes for approvals from commencement (both commenced November 2021) are 4-6 months for Phase 1 and 12 months for Phase 2.

Deferred Capital

Upgrading the site using a staged approach also allows a significant portion of Project capital to be deferred, while still achieving increased tungsten concentrate production and improved operational profitability in the short term. The Phase 1 activities spend only the capital required to support the LGS mining. As the approvals for the open pit mining will require approximately 12 months, there is value in deferring the Phase 2 capital expenditure, while Phase 1 works will maximise the profitability of the operations during the period Phase 2 is constructed.

4.2. Project Execution Strategy

4.2.1. Project Management

The Project and construction management approach has been determined by the Project's procurement and contracting strategy which is summarised in Section 4.2.2.

EQR will engage a project management firm to lead the project management of the Project and operate on its behalf in the management of the services, while incorporating relevant existing site personnel where necessary to provide input and management support.

The integrated management model is presented as a simplified chart below in Figure 1 where dotted line connectors reflect contract agreements while solid lines represent reporting and management responsibilities.

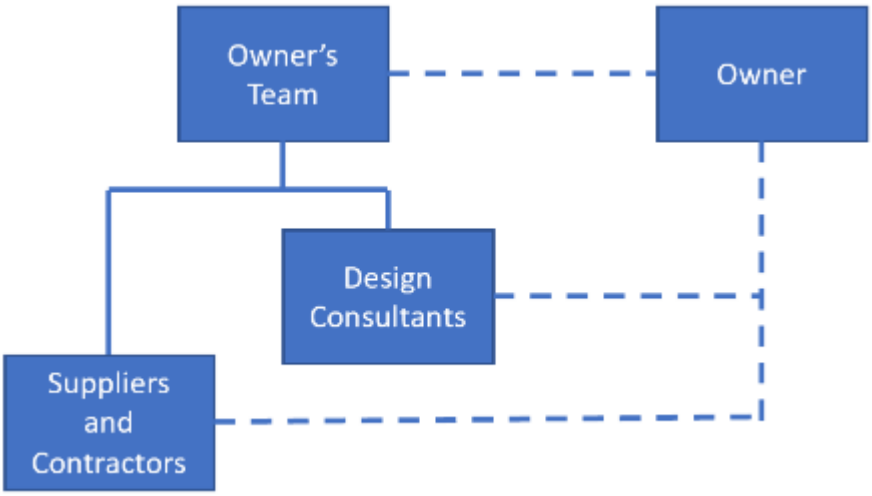


Figure 1: Owner's Team Contracting Structure

The benefits of executing the Project in an integrated owner's team capacity over a traditional engineer, procure, construct (EPC) approach include:

- Elimination of margin duplication (EPC contractor margin on subcontractor margin);
- Greater control of scope packaging and contractor selection;
- Enhanced ability to utilise local labour and contractors; and
- Greater ability to utilise and leverage operations personnel and experience in the management and delivery of the works.

The Owners' Team will coordinate and manage the execution of the delivery packages in accordance with the contracting strategy detailed in Section 4.2.2. Recognising the brownfield nature of the works and EQR's knowledge of the site, the project management partner will work closely with EQR and its preferred contractors, where appropriate, to maximise the existing knowledge and understanding of the site and existing infrastructure.

The proposed Project organisation chart is shown below in Figure 2 with EQR personnel in blue and project management partner personnel in green.

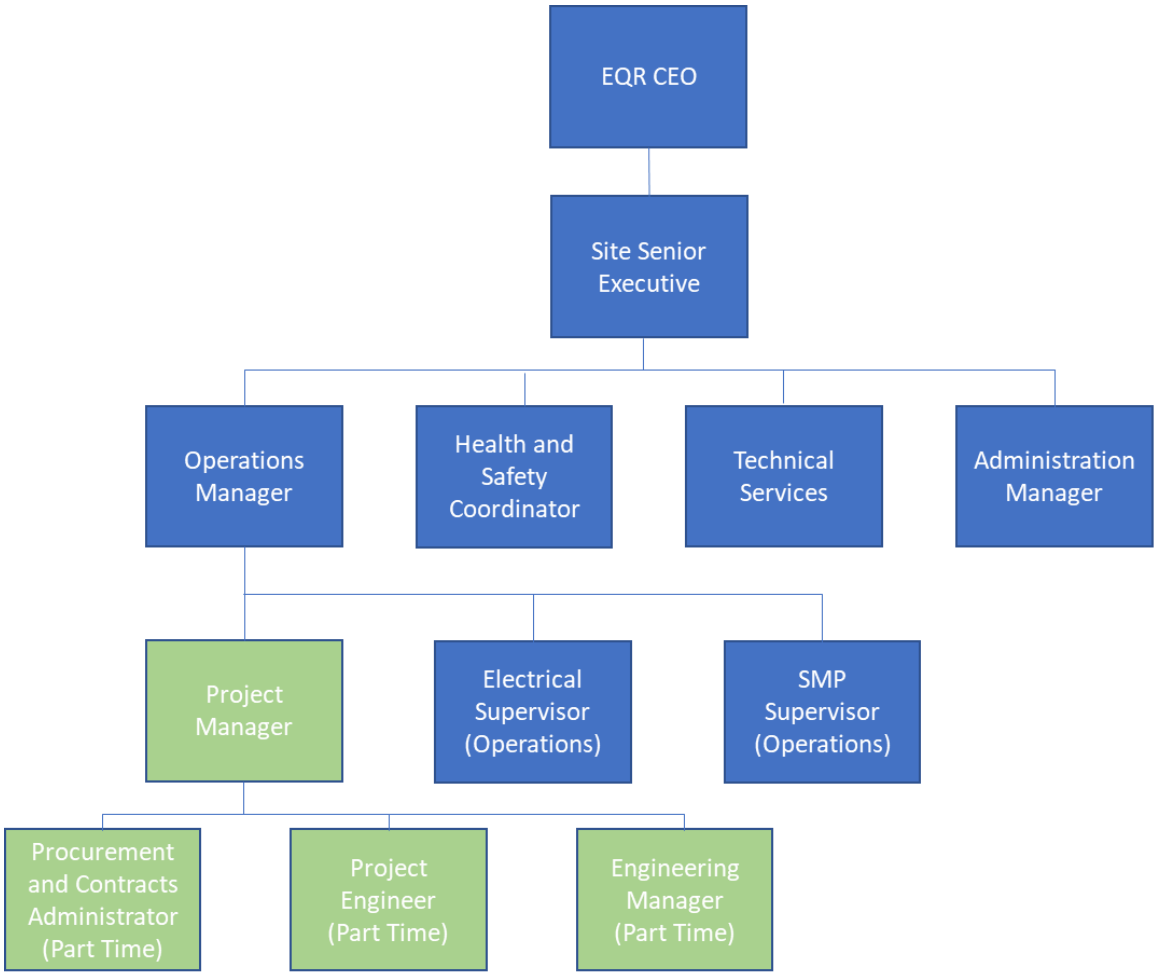


Figure 2: Owner's Team Organisation Chart

The Project Manager will be responsible for the procurement and the on and off site coordination and management of the contractors with support from the Procurement and Contracts Administrator and Project Engineer. The Project Manager will report into the EQR Operations Manager.

The Health and Safety Coordinator (EQR Operations team) will support the Project with the management of contractor safety compliance. The Health and Safety Coordinator and the SSE will review and ensure the contractor's safety systems and practices are aligned with the site safety and health management system. The SSE will delegate the personnel within the operations team the responsibility to assess and accept the installed infrastructure in accordance with the Mining and Quarrying Safety and Health Regulation 2017.

4.2.2. Contracting Strategy – Phase 1

The scope of the Project has been assessed and split into contract packages for the procurement and implementation management by the Owner's Team. The major packages are summarised in Table 2.

Table 2: Major Contract Packages

Package Type	Description
Design	Crushing and Sorting Plant Upgrade and Excess Product Dewatering
Design and Construct	Overhead Line and High Voltage Electrical Upgrade
	SCADA Upgrade
Supply	Structural Steel and Platework

Package Type	Description
	Pipework
	Conveyors
	Wet Screen
	Dewatering Screen
	Cyclones
	Pumps
	Water tanks
	Processing Plant Control Room
	Sorter Circuit Equipment - VSI and Wet Screen*
	Rolls Crusher*
	Containerised Storeroom and Workshops
Construct	Concrete
	Structural, Mechanical and Piping
	Low Voltage Electrical (including materials supply)
Mobile Equipment	Hyundai 980, CAT D6, 3 x Trucks*
	50t Excavator
	Bobcat

*Denotes packages managed by the EQR operations team

The identified long lead procurement packages that will require expedited design and procurement focus with a potential lead time of 16 weeks are:

- Conveyors;
- Wet Screen; and
- Dewatering Screen.

The Project duration will be minimised through the identification of existing second hand or off-the-shelf procurement items for the potential long lead items. Fabricators will be mobilised to the site for the conveyor steelwork fabrication and all conveyor items have been identified as in-stock from suppliers in Cairns. This will significantly reduce the lead times on all long lead items.

4.2.3. Contracting Strategy – Phase 2

The scope of the Project has been assessed and split into contract packages for the procurement and implementation management by the Owner's Team. The major packages are summarised in Table 2.

Table 3: Major Contract Packages

Package Type	Description
Design	Crushing, Screening and Sorting Plant
	Process Plant Upgrade
Supply	Structural Steel and Platework
	Pipework

Package Type	Description
	Valves
	Conveyors
	Crushing and Screening Equipment
	Process Equipment
	Electrical and Instrumentation
	Core Shed
	Water tanks
	Workshop
Construct	Concrete
	Structural, Mechanical and Piping
	Electrical
	Electrical and Instrumentation
	Workshop
	Core Shed

At the commencement of detailed design, long lead items will be identified and procured as a priority to ensure the schedule.

A decision will be made during the procurement phase as to whether any or all of the concrete, structural, mechanical, piping (SMP) and electrical and instrumentation (E&I) packages are split between the crushing screening and XRT sorting plant or combined into sitewide packages.

4.3. Construction Safety Approach

EQR's policies, procedures and legislative requirements establishes the minimum standards for safe work practices on the site. EQR's execution strategy will develop a culture where leadership is by example. EQR will demonstrate care and ensure an ongoing process of continuous improvement in this model. This will involve everyone, and the ultimate accountability will be by all.

The Project health and safety strategy will include:

- The safety and health management system (SHMS) will be fully integrated into the Project's delivery;
- Construction contractor's construction safety management plans will be assessed to ensure that at a minimum they meet the requirements of the site's SHMS prior to mobilisation. Where contractor specific procedures and instructions are missing, these will be developed by the contractor, approved by the Owners' Team and incorporated into the sitewide SHMS;
- Statutory requirements as per the Mining and Quarrying Safety and Health Act 1999; and
- Aim to reduce employee risk by minimising high risk activities and reducing the labour requirements on site through the use of off site works, pre-assembly, modularisation and lower labour installation methodologies.

In accordance with the Mining and Quarrying Safety and Health Act 1999, the SSE will be the statutory safety authority over all activities on the mining leases. Once construction commences, the construction team will be required to liaise with the SSE.

The SSE will appoint in writing suitable parties to fulfill electrical obligations for the execution and operations in accordance with the Mining and Quarrying Safety and Health Regulation 2017.

Leadership of safety will be at all levels and a key criteria of individuals' site performance and position descriptions.

Further details on safety are detailed in Section 6.

4.4. Shut Downs and Tie Ins

Whilst the Project is by nature a brownfield upgrade, a large proportion of the scope can be constructed effectively with minimal interface with the ongoing operations.

4.4.1. Phase 1

Phase 1 is largely comprised of brownfield tie ins to the existing crushing plant. Timing for the construction activities will be structured that they occur during planned shut downs or maintenance periods.

The timing of each activity will be structured to minimise plant down time. Key strategies include:

- Wet screen foundations will be constructed during a shut down and covered over until structure is ready for placement; and
- New mechanical equipment will have electrical tie in to new 500kVA substation minimising impacts on existing operations.

4.4.2. Phase 2

Crushing Screening and Sorting Plant

The new crushing, screening and XRT sorting plant is physically separated from the existing crushing plant, so its construction can occur with minimal interference to existing operations.

The XRT ore sorters will be relocated at the latest possible time, after no load commissioning of the feed and discharge conveyors is completed to minimise the down time in XRT sorter operations.

The electrical tie in to the 500kVA substation will be completed during operational down time.

Gravity Processing Plant

The gravity processing plant requires a significant number of tie ins to allow for the installation of new additional process equipment.

The equipment will largely be installed in and around the existing plant equipment. The tie in strategy for the new equipment to minimise the impacts on the existing operations involves the installation of a new motor control centre (MCC) for all new equipment. This allows for the electrical wiring of the equipment to be done to an MCC that is not live and mitigates the risk of incorrect electrical isolation when installing the equipment.

Where pipes and equipment tie into the existing gravity processing plant, as much will be installed as possible prior to a plant shut down to install the tie ins. These may be done on a circuit-by-circuit basis to minimise the length of each shut down. A detailed shut down and tie in philosophy and plan will be developed in the execution phase.

4.5. Construction Risk

The Owners' Team will actively manage construction risks and work closely with all contractors involved with construction on a regular basis. The Owners' Team will routinely audit the safety performance and risk management activities of its contractors utilising the site’s existing risk management platform.

The Project's approach to risk management is detailed in Chapter 14: Risk and Opportunity.

4.6. Contractor Responsibilities

Under the contracting strategy, the construction contractors will be responsible for the day-to-day management and execution of their works including:

- Offsite logistics management strategy;

- Responsibility for provision of:
    - Mobile equipment;
    - Cranes; and
    - Scaffolding.
- Management of delivery, storage and preservation of above materials and mobile equipment;
- Receipt, storage, preservation and installation of EQR supplied items;
- Provision of special construction plant and equipment (large cranes, heavy transporters, etc) requirements including strategy to secure or provide such items;
- Labour sourcing, accommodation and transport; and
- Development of site management systems and procedures in accordance with EQR's SHMS.

EQR will evaluate the contractors' capability to execute the above responsibilities during the tender evaluation phase to ensure only suitably capable and resourced contractors are engaged to execute the works.

4.7. EQR Construction Responsibilities

The responsibilities of the Owners' Team include:

- Managing and monitoring compliance with the site's SHMS in all construction related activities;
- Compliance with applicable development and environmental permits;
- Preparation – site survey, site facilities, site access and security;
- Administration of contracts on the construction site;
- Coordination of all work and interfaces on the site;
- Delivery to site, storage, preservation and management of company supplied equipment/materials for installation by contractors;
- Monitoring and auditing contractors' activities to ensure that Project employee relations requirements are complied with;
- Interface management with third parties;
- Monitoring and auditing contractors' safety management, industrial relations management, environmental and quality control systems to ensure that, compliant, acceptable and correct work practices are followed;
- Monitoring contractors' progress to ensure Project program / schedule requirements are met; and
- Support the installation and commissioning activities.

4.8. Schedule and Milestones

The key Project execution milestones forecast dates are summarised in Table 4. The execution schedule is also included in Appendix B.

Table 4: Key Milestones

Milestone	Forecast Date
Phase 1	
Commence Engineering and Procurement	November 2021
Commence Approvals Process	November 2021

Commence Construction	December 2021
Construction Complete	February 2022
Commissioning Complete	February 2022
Phase 1 Approvals Received	April 2022
Phase 1 Complete	April 2022
Phase 2	
Commence Approvals Process	November 2021
Commence Engineering and Procurement	February 2022
Commence Construction	July 2022
Commence Mining Contractor Mobilisation	September 2022
Construction Complete	November 2022
Approvals Received	October 2022
Commissioning Complete	November 2022
Phase 2 Complete	November 2022

4.9. Construction Surface Water Management

There is no requirement to substantially alter the existing drainage infrastructure currently supporting the site and its operations. As far as construction activities are concerned, the only surface water management requirement is to ensure that all local runoff from the contractor's site is captured and directed into the site's existing drainage system.

Figure 3 below illustrates the site's drainage system.

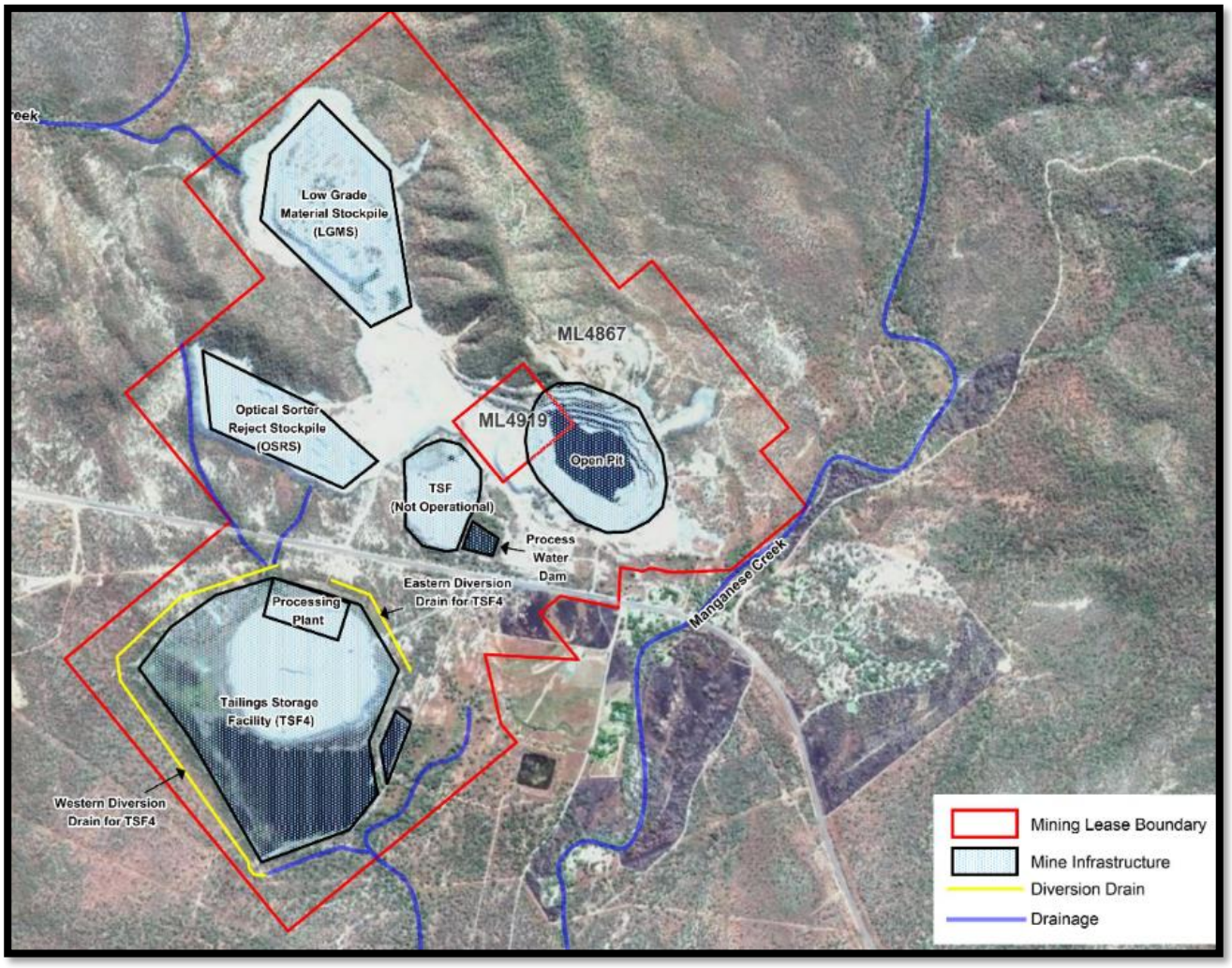


Figure 3: Sitewide Drainage

5. Risk Management

A Risk & Compliance Management Plan will be developed as a framework to manage risks during the execution phase of the Project.

5.1. Project Risk Management

Monthly, the EQR project team will review with the supervisors the risks related to each of their associated responsibilities, implement agreed controls, review previously implemented controls to ensure effectiveness and update the Risk Register.

The Owner's Team, will collaborate with the contractors engaged for execution to manage all risks and opportunities identified in the feasibility study.

Further risk reviews and risk workshops will be carried out with each contractor engaged for the execution phase. All risks captured and mitigated will be regularly updated on the Project's Risk Register.

5.2. Site Risk Management

The site risk management will be in accordance with the site SHMS. This system allows for the capturing of workplace interactions (previously referred to as safety observations), hazards, events and incidents and the management of actions to control the identified risks.

The overall process for hazard management is limited to the identification of hazards and the creation of actions to manage the hazards.

The process for managing the risk is carried out in four main steps:

1. An event is raised (notified);
2. The event is classified by a responsible supervisor;
3. The event is investigated, and remedial actions assigned if required; and
4. Submitted for sign off.

6. Health, Safety and Environment

All work undertaken on this Project shall be performed in compliance with the Project's safety policy, standards, procedures, processes and any relevant legislation as stipulated in the Safety & Health Management System (SHMS). The Owners' Team will be responsible for safety for the works.

Contractors will be required to prepare and submit a contractor Health and Safety Management Plan to the Project team for review. The contractor Health and Safety Management Plan will be reviewed for compliance with the guidelines and procedures of the SHMS. Contractors will not be permitted to mobilise or commence work on site until their plan achieves an acceptable level of compliance and is approved. At all times the EQR SHMS will remain the benchmark for contractor compliance requirements.

The key safety focus areas for the site-based team include:

- Providing visible lead roles in promoting, and ensuring that contractors' management and supervisory staff are fully committed to the very high standards of safety expected on site;
- Undertaking a schedule of regular safety interactions;
- Ensuring that contractors are aware that safety will not be compromised;
- Audit of site safety against each contractor's Health and Safety Management Plan;
- All critical construction is planned and managed by a combination of risk assessments (Wait Take 5,s/JSA/JSEAs, HAZOPS) and Work Method Statements or Safe Work Procedures;
- Training of staff and competency verification;
- Collection, collation and reporting of site safety statistics; and
- Timely contractor provision of incident notices and investigation reports as required by site regulations.

6.1. Safety and Health Management System

EQR has developed and currently operates under an SHMS for its operations. This will also form the basis of the SHMS for the project. During the execution phase, the SHMS will evolve to ensure its suitability for the activities being conducted on the site.

The SHMS provides a systematic management framework designed to provide the requirements for safe systems of work, and a safe and healthy workplace for all personnel at Mt Carbine. It is designed to include:

- Principal hazard management plans;
- Standard operating procedures; and
- Procedures not defined as a safe operating procedure in the legislation, however, required to be included in the SHMS.

The risk assessments required by legislation to underpin the SHMS will be carried out with the construction workforce to manage the relevant risks that have been identified through the development of the SHMS framework. These risk assessments and future risks identified with the construction and operational activities for each area will be carried out with the relevant workforce as they mobilise to site. This is a continual review and update process to ensure as low as reasonably practicable controls are put in place to minimise the risk.

There is a requirement under Part 11 of the Mining and Quarrying Safety and Health Regulation 2017 for standard procedures and work instructions to be developed for construction and operational tasks at the mine site. These will be developed or amended as required to suit the mine conditions in conjunction with the SSE and the workforce and incorporated into the SHMS.

EQR will leverage the construction contractors' expertise and existing systems and operating procedures to suitably develop the SHMS for construction activities. Where gaps exist in the existing SHMS for construction specific activities, contractors' existing work instructions and operating procedures will be reviewed and incorporated into the sitewide SHMS.

6.2. Permits

Contractors shall comply with EQR's work permit system to control work and access to specific potentially hazardous tasks or areas in their workplace. The system needs to cover; the work to be completed, potential hazards, and controls to be put in place including any safe work procedures to be followed. Hazardous tasks or areas include but not limited to:

- Confined space;
- Work at heights;
- Hot works;
- Excavation;
- Isolation; and
- Grating, guarding and handrail removal.

All permitting, and work permit systems shall be developed and carried out in accordance with the requirements of the SHMS.

6.3. Environment

All work undertaken on this Project will be carried out in strict accordance with the relevant clauses of the general and special conditions of the contract and the Environmental Management Plan that will be developed for the Project as well as the contractor specific environmental requirements that will be developed as part of the SHMS.

Contractors will be required to develop a Project specific Environmental Management Plan based on the above, covering all environmental aspects related to their scope of work. The Health and Safety Coordinator will review the contractors' Environmental Management Plans. Work will not be permitted to commence on site until the plan is accepted.

6.4. Environmental Approvals

The environmental approval requirements and schedule are detailed in Chapter 10: Environment and Approvals.

7. Human Resources

7.1. Owner's Team

The Owner's Team responsible for the management of the Project's execution will be a combination of EQR employees and contractors to supplement EQR's capabilities and fill temporary roles required for a relatively short duration during construction.

7.2. Owner's Team Working Roster

The owner's construction team will be mobilised mainly to work a day work roster with no construction night shifts anticipated.

The site team will work predominately a 5/2 or 10/4 roster at nominally 12-hour days. Key team members will work alternating rosters to ensure adequate coverage on site over the continuous construction activities. Options for fly in/fly out (FIFO), drive in/drive out (DIDO) and local hire will be made available.

All rosters will be required to be risk assessed and approved by the SSE in accordance with SHMS before being implemented on site.

To manage fatigue onsite, the total number of hours worked cannot exceed the EQR Fatigue Management Procedure.

Individual travel plans will be developed for all people on site to take into account rest provisions.

7.3. Contractor Personnel

EQR will engage contractors from the nearby communities and regions as much as possible in accordance with its policies and current operational practices.

Based on an assessment of the scope of work required and available services, EQR does not foresee the need to engage contractors beyond Cairns except in the case of specialised equipment supply.

7.4. Construction Contractors' Working Roster

Construction will take place over seven days on a continuous day-work roster. This includes individual public holidays.

Shifts will be based on operational needs and not exceed the EQR Fatigue Management procedure Individual contractors will be asked to submit required construction hours and preferred shift patterns at time of tender to be able to satisfactory execute their plans. Alignment with the EQR team rosters will be preferred but rotating shift structures that allow for safe construction will be considered. All shift patterns will need to meet site guidelines for fatigue management and satisfactory supervision after hours.

Certain key construction activities such as large lifting will be deemed to be 'daylight only' activities.

All contractor rosters will need to be approved by EQR and be required to be risk assessed and approved by the SSE in accordance with the SHMS.

7.5. Construction Human Resources Management

Underpinning the expectations and obligations of contractor employee relations, performance and accountability will be an Industrial Relations Management Plan, to which all contractors will be bound, with compliance and performance measured. This will be developed prior to execution and will be aligned to the existing industrial relations structure for the current operations.

The plan will ensure it is a requirement that the Owners' Team and contractor representatives meet on a monthly basis, at a minimum, (or more regularly, as required) to discuss any potential issues, as well as further matters such as manning levels, reporting, accommodation and the mobilisation process.

These meetings should also address leadership capability, and performance and effectiveness of leaders.

Where possible, these meetings should highlight opportunities and interventions for further support needed for leaders.

8. Planning and Scheduling

Project planning will be based on a resource loaded critical path method schedule. Following Project commencement, the Project Schedule will be finalised and stored as the Baseline Schedule and locked down and not changed without formal management of change approval. The Project Schedule will then be regularly updated with progress and forecasts and compared against the Baseline Schedule.

Primavera (P6) or Microsoft Project shall be used for planning, scheduling, resource levelling, capturing progress data, development of what-if scenarios and interrogation of schedules.

The purpose of planning and scheduling is to determine and communicate how, when and with what resources (people, equipment, services and material) the scope of the Project will be delivered. The schedule provides a better understanding of the Project, assists to predict when the work will be delivered, allows optimisation of resources and contributes to cost minimisation through effective management of schedule interfaces.

The Project Execution Schedule is included in Appendix B and the key construction milestones are summarised in Section 4.8.

8.1. Baseline Schedule

The schedule developed throughout the feasibility study and then approved as part of the Final Investment Decision (FID) will be copied and then set as the Project Baseline Schedule. The Baseline Schedule will be locked down and no changes will be made to it without approved Project scope changes.

Schedule performance throughout the execution stage will be compared to what was planned in the Baseline Schedule.

8.2. Master Schedule

While the Baseline Schedule remains unchanged, the Master Schedule will start from the same FID approved schedule and will be regularly updated to reflect the latest information available. The Master Schedule will be updated with actual dates, progress, remaining durations, forecasted dates, contractor schedule updates, productivity updates, delays, etc.

The Master Schedule data date will move as the Project progresses and all Project schedule reporting will come from this updated Master Schedule.

8.3. Schedule Structure and Coding

The Project schedule will be presented using the Project's Work Breakdown Structure, with all scheduled activities coded against Project phase, work packages and a responsible manager.

8.4. Schedule Updates and Reporting

The Master Schedule will be updated twice per month, once at mid-month and once at month end. The data date will be set to the nearest workday that aligns to mid-month and month-end for each of these. Inputs to schedule updates must be timed to allow for schedule and progress report inputs to weekly and monthly reports.

As schedules are updated, Project total float, package float and contractor's float will be managed in accordance with the process described in the Planning and Scheduling Procedure and the Change Management Procedure.

Schedule reports include detail and summary activity reports, three-week lookaheads, progress reports, milestones, critical path and the associated commentary, all with the goal of providing a better understanding of the Project to optimise project outcomes.

9. Cost Management

Cost control is a management process where the Project's costs being committed, spent and forecast are compared against the planned costs (i.e. approved Project Budget) to highlight variances and thus inform mitigating actions. Cost control is highlighted here, and more detail will be developed in the future in an execution phase Cost Control Procedure.

The process of control is a continuous cycle and to be effective must be forward-looking:

- Plan and define the baseline;
- Execute the works;
- Measure and compare against the plan (using the forecast);
- Act; and
- Re-plan / re-forecast and repeat the process.

9.1. Requirements

The Project Controls Manager will be responsible for maintenance of the cost management system, its processes and reporting.

The main processes include:

- Maintenance of the Project cost control system;
- Enforcement of the Project cost and Work Breakdown Structure;
- Recording commitments and costs to date;
- Allocation of budget to commitments and identification of cost variances;
- Commitment control and reporting;
- Forecast costs associated cashflow;
- Identification of trends for un-awarded scope and preparation of trend reports; and
- Preparation / production of cost reports at various levels of detail.

Project cost information is required for EQR's financial system:

- Monthly accrued costs and cash-call forecast; and
- Breakdown of completed costs for capitalisation.

9.2. Cost Control Procedures

9.2.1. Budget

Following the FID, the capital costs presented in the estimate and financial model supporting the FID will be transformed into the project's original budget. The budget will include quantities, personnel hours and costs.

9.2.2. Conversion of the Estimate to the Original Budget

Project budgets shall be compiled from the estimate, so that every estimate item is allocated to a budget control account within the cost management system. This compilation process will occur prior to execution phase kick off. Compilation of the original budget follows the guidelines below:

- Breakdown of costs at least by WBS level 3 code

- Breakdown of costs at least by commodity level 1 code;
- Breakdown of costs by package code aligning with the Contracting Plan (EDC-EXE-80000-CN-PLN-0002);
- Inclusion of escalation costs into original budget items;
- Inclusion of growth estimates into original budget items; and
- Inclusion of package specific contingency into the original budget items.

The original budget must include the following data:

- WBS;
- Commodity code;
- Package;
- Description;
- Control account;
- Responsible person;
- Original budget amount;
- Original budget quantity; and
- Original budget hours.

Once approved, the original budget will remain unchanged through the life of the Project.

The original budget will be time-phased and integrated with the Project Schedule. Changes to the current budget may only be made by an approved Project Change Notice or Project Manager approved Internal Budget Transfer Form.

9.3. Supplementary Approvals

If the Project is forecast to overrun its approval threshold, this will need to be communicated to the EQR Board early and the supplementary approval process implemented promptly.

9.4. Commitments

Project commitments will be reported as the awarded value of all purchase orders, contracts and commit-as-incur costs. Commitments will be time-phased based on the Project Schedule. This requires all contract award dates to be explicitly identified in the Project Schedule.

Commitments are an early indicator of project scope, cost and schedule performance against baselines. Commitment control of all agreements is therefore an integral part of effective project cost control. Before a commitment is placed, the project controls function must be involved to review the proposed commitment against the budget and allocate the budget to the commitment on a scope for scope basis.

A project-based approval will occur before any commitment and purchase requisitions are raised or approved in the corporate ERP system. The objective of the project-based approval will be to:

1. Ensure the technical scope is aligned with Project objectives;
2. Analyse and report on variance to Project budget;
3. Ensure commercial compliance; and
4. Require Project Manager approval as per the Project Approval Matrix

The project-based approval will be done via a Recommendation for Award (RFA) workflow process. Proposed commitments will be reviewed to include a specified growth allowance if appropriate. Where appropriate, a

specified growth allowance will be assessed to enable timely management of minor contract variations. This will be included in the budget but not the initial commitment.

9.5. Incurred Cost

Incurred costs are based on the value of work performed, including the value of goods manufactured or received. Accruals are used to bridge the gap between invoiced costs and incurred costs with incurred costs being the sum of invoiced costs and accruals. Accruals bring the value of work up to the end of the reporting period to ensure accurate and consistent reporting, independent of when invoices are received. It is the responsibility of the Project Manager to calculate accruals at month end and submit these calculations to Finance for inclusion in month end reporting.

The record of truth for project incurred costs will be held in EQR's financial system. This will be reconciled monthly to ensure alignment in cost reporting.

9.6. Forecast Final Cost

Project Forecast Final Cost (FFC) is the primary focus of the Project Controls Team and is defined as the latest forecasted total cost at completion of the Project. The FFC can be calculated as the sum of all current committed works plus the sum of all forecasted work yet to be committed.

When forecasting, committed works shall be forecast based on the current value of the commitment, plus known allowances, plus any productivity adjustments. Sources of this data includes recommendation to award documents, purchase orders, contracts, variations, site instructions, day works dockets, quantity unit rate reports and earned value reporting. Each contract variation will be linked to an associated trend and the trend will be approved prior to approval of the variation.

Uncommitted works shall be forecast based on estimated values plus approved project trends. Unapproved trends will be kept in the Trend and Scope Change Register and reported as potential changes. These will not be included in the estimate at completion value.

9.7. Time-phasing of Costs

Commitments and incurred costs shall be time-phased within the Project Cost System by integrating with the Project Schedule. Commitment timing shall be aligned with contract award milestones or activities. All time phased data will include cumulative planned, actual and forecast curves, with incremental period data displayed in a histogram.

9.8. Contingency

A provision will be included in the budget to cover contingency. Project contingency is an allowance for many issues which cannot be explicitly predicted at the time of the estimate. This provision is to cover the inherent inaccuracies of the estimating process, schedule float and to make an allowance for perceived project risk events that have significant cost impact should they occur.

As the Project progresses with package certainty and contingency allocated upon award, risk and uncertainty will be reduced, and the value of project contingency will be reduced accordingly. Project contingency forecast will be reported each month showing remaining project contingency against remaining risks and uncertainties.

9.9. Progress Measurement

The objective of progress measurement is to ensure accurate tracking of work completed and work yet to complete and compare this against plan to identify any required corrective actions to bring the Project back to plan. Progress measurement is highlighted here, and more detail will be found in the Progress and Performance Measurement Procedure which will be developed for the execution phase.

9.9.1. Progress Measurement and Reporting

Project progress shall be measured as a percentage completion of actual work done versus total work scope for the Project to:

- Compare actual progress with planned;
- Compare actual productivity with planned productivity;
- Identify and undertake corrective actions resulting from deviations from the plan; and
- Enable forecasting of progress to complete remaining scope.

Progress measurement and reporting is the responsibility of the Project Controls Team.

9.9.2. Progress Measurement Basis

Progress will be calculated for each of the packages making up the entire Project scope. The progress measurement basis for each of the Project components within each package can be broken down as listed in Table 3.

Table 5: Example of Progress Measurement Basis

Component	Basis of Measure	Weighting
Procurement	Rules of credit based on procurement process steps.	15%
Design	Rules of credit based on physical progress of deliverables.	15%
Construction	Rules of credit based on physical quantities installed.	60%
Commissioning	Rules of credit based on systems commissioned.	10%

9.9.3. Procurement Progress

Progress of the Owners' Team procurement effort is a lead indicator of overall schedule performance as any acceleration or delay against plan to the award of Project contracts will have a direct impact on completion dates. A detailed Procurement Schedule is incorporated into the Baseline Project Schedule where each procurement package will have procurement activities assigned. Close attention will be paid to the required on site dates compared to when items or teams are forecast to be on site.

Procurement progress will be measured through standard procurement rules of credit. Each stage in the procurement process will be reflected in the current Project Schedule.

9.9.4. Design Progress

Design progress shall reflect the status completion of the engineering effort to design the Project Scope. Weighting of each contractor's design activities will be based on effort.

Engineering consultants will be engaged and required to report on progress. If a time reimbursable contract model is used, earned value reporting will be required. During the detailed design phase, Deliverable Registers and the Engineering Work Package Register must form the basis for a consultant to claim progress. Budget hours should form the weighting for each deliverable and rules of credit, or milestones for transmittal of deliverables will define percentage completion values.

9.9.5. Construction Progress

Construction activities will be progressed through the measure of installed quantities or pre-determined rules of credit. These will be used to create the key commodity progress curves.

Typical curves include:

- Commodity installation by period for key commodities, typically; drift excavation, bulk earthworks, concrete, structural steel, piping, mechanical plate work, cable tray, wire and cable, and terminations;
- Direct labour requirement, both in hours and full time equivalent, by period; and
- Construction percent progress by period.

Direct labour hours are used to normalise the various commodities being installed.

A key driver to successful quantity-based progress reporting is the alignment of detailed installation reporting by contractors and the requirements to compile overall Project Progress Reports. Contractors must be able to report actual hours and progress data at agreed levels of detail via Quantity Unit Rate Reports (QURR). Where lump sum or quantity-based schedule of rate contract models are in place, actual hours may not be available at detailed levels.

Progressing Rules of Credit

Installation of some key commodities involve several steps through the construction process. In these instances, steps are defined, and percent progress assigned to each step, to define agreed Rules of Credit for a commodity.

9.9.6. Pre-commissioning and Commissioning Progress

Once the pre-commissioning and commissioning systems have been established, progressing of the pre-commissioning activities is carried out like the construction activities using pre-determined Rules of Credit.

9.9.7. Productivity

Productivity measurement and analysis varies depending on the contracting model employed. For cost plus style contracts, actual hours and quantities must be tracked at a detailed level as productivity risk lies with the Project. For lump sum or quantity-based schedule or rate style contracts, the cost risk is more with the contractor, so focus is on whether activities are progressing at planned rates. Under this model there may be less information regarding actual hours and productivity information is typically not available.

Earned Value

Earned value will be used to assess productivity against the baseline. Earned value analysis can be performed at the project, contract or discipline level. Earned value reports will be calculated as detailed in Table 6.

Table 6: Earned Value Item and Calculation

Earned Value Item	Description of Item and Calculation
Earned Value (hrs)	Physical % Complete x Budget Hours.
Earned Value ($)	Physical % Complete x Budget Amount.
Physical % Complete	Installed Quantity / Forecast Final Quantity.
Actual Hours (hrs)	Actual hours used to date on the deliverable / package.
Actual Value ($)	Actual cost assigned to deliverable / package (if available).
Budget Value ($)	Budget value assigned to deliverable package.
Estimate to Complete (hrs)	Estimated hours to complete deliverable / package.

Estimate to Complete ($)	Estimated cost to complete the deliverable / package.
Estimate at Completion (hrs)	Actual Hours (hrs) + Estimate to Complete (hrs).
Estimate at Completion ($)	Actual Value ($) + Estimate to Complete ($).
Cost Performance Index (CPI)	Earned Value / Actual Value.
Schedule Performance Index	Earned Value / Planned Value (at data date).

A Cost Performance Index greater than one (1) is desirable and indicates that for every hour expended, more than one hour's worth of budget is being earned.

A Schedule Performance Index greater than one (1) is desirable and indicates that hours earned are ahead of the planned value at the data date.

9.9.8. Construction Productivity

QURRs provide detailed analysis of productivity factors (labour burned vs earned) for installation works. This report is used to analyse specific installation activities within a contractor's scope of work and will be focused on key commodities or critical activities. A QURR will typically have the headings as listed in Table 7.

Table 7: Typical Quantity Unit Rate Report Headings

Earned Value Item	Description of Item and Calculation
WBS	Work breakdown structure level 4 code (as per code of accounts).
Commodity	Contract pay item.
Description	Description of the item.
UoM	Unit of measure.
Quantity Estimate at Complete	Forecast total quantity for the item.
Quantity Period	Quantity installed in the period.
Quantity to Date	Total installed quantity to date.
Hours Budget	Budgeted labour hours for the item.
Hours Actual This Period	Actual hours spent on item in the period.
Hours Earned to Date	Progress to date (%) x hours budget.
Hours Actual to Date	Actual hours spent on the item to date.
Progress This Period (%)	Quantity period / quantity estimate at complete.
Progress to Date (%)	Quantity to date / quantity estimate at complete.
Productivity This Period	Hours actual this period / hours earned this period.
Productivity to Date	Hours actual to date / hours earned to date.
Unit Rate Forecast	Hours estimate at complete / quantity estimate at complete.
Unit Rate This Period	Hours actual this period / quantity this period.
Unit Rate to Date	Hours actual to date / quantity to date.

9.10. Change Management

The effect of any change on a project can be far reaching and have significant effect beyond the immediate area of change. Change during the execution phase should be minimised as changes become more expensive and time consuming as the project progresses beyond the definition phase.

The key requirements of an effective change management process for the Project include:

- The philosophy of "management of no change" should guide the Project Team to execute the Project within the bounds of approved Project Scope. Change should be the exception rather than the norm;
- All Project team members are responsible for identifying and communicating potential change to the Project Controls Team in a timely manner;
- All changes are identified and captured in a Trend and Scope Change Register;
- All changes are discussed and dealt with in a timely and regular basis; and
- No scope of work associated with a potential change commences until a change has been approved.

Approval levels for both cost and schedule shall be in accordance with the Project's Delegated Authority.

9.10.1. Types of Change

Potential changes will be categorised as one of the following:

- Project Scope Change – a change to the defining or underlying business case against the proposed capital development that affects the Project's objectives. Changes can affect cost, time, quality, risk and more often, a combination of these.
- Contract Scope Change – a change to executed contract scope. Changes can affect cost, time, quality, risk and more often, a combination of these.
- Trend – an anticipated deviation from the Project's budget. For example, further design, investigation, execution planning, performance or awareness of markets now reveals a difference in physical quantity, rate, cost or time to the approved baseline.

Scope changes require a different level of approval from non-scope changes (trends).

9.10.2. Change Through the Project Lifecycle

As the Project progresses through the phases of development, the focus of the change management effort will shift:

Design Phase

- Monitoring of designed commodity quantities to forecast construction costs (using budget rates).
- Monitoring design development within approved growth amounts.
- Early identification of design change that may impact multiple disciplines or contractors.
- Reinforce a "management of no change" philosophy to design.
- Trending of engineering hours and forecast final cost.

Procurement Phase

- Monitoring of tendered commodity rates against budget rates to forecast Project construction costs e.g. cost of concrete increases in first package tendered, review concrete rates across the Project.
- Monitoring of Tendered Schedule durations versus Baseline Schedule.
- Identification of any scope omissions identified during the procurement effort.

- Review of tendered commodity rates against other execution packages.

Construction & Commissioning Phase

- Monitoring of installation productivity versus budget installation rates to assist forecasting contractor forecast final cost.
- Review contractor claims with the commercial team and incorporate into Project forecasts where applicable.
- Review of site instructions and contract variations against Project forecasts.

9.10.3. Trend and Scope Change Meetings

Trend and scope change review meetings allow the Project Manager to review the potential trends and categorise each one as:

- Potential – trend identified, further investigation / estimation is required to process;
- Pending – trend has been estimated and is awaiting approval;
- Approved – trend approved and signed off, cost reports and schedules updated;
- Revise and Resubmit – trend requires changes before resubmitting for re-approval; or
- Rejected – trend rejected.

Trend and scope change review meetings shall be held at least fortnightly (more frequently as required), with one scheduled to occur during the week prior to the end of month-end reporting cut-off to enable the cost report to be updated to reflect the most current information available.

The Trend and Scope Change Register shall be recorded in the cost management system and include the status of potential trends and changes. The output will be presented each month in the Project monthly report.

10. Reporting

10.1. Project Weekly Reporting

Weekly reports shall be compiled by the Project Manager with inputs from consultants, contractors and functional leads. The cut-off date for weekly reports is Friday with the reports issued by close of business Tuesday. The weekly reports shall focus on:

- Activities completed during the week;
- Activities planned for next week;
- Risks / opportunities / issues;
- Key schedule milestones that fall within the date range between period start less one week and weekly period end plus two weeks; and
- Three week look ahead schedules.

10.2. Mid-monthly Schedule Update

Twice a month, the Project Schedule will be updated with the latest progress and forecast information. Consultants and contractors will be commercially obligated to provide schedule status and updates aligned with the Project's twice monthly reporting requirements. After each update, the following weekly report will reflect this update. The Schedule Update Report will include:

- Progress curves, both overall and by area, showing planned progress, actual progress and variance;
- Key commodity installation curves and progress curves;
- Quantity unit rate reports;
- Project schedules; and
- Three week look ahead schedules.

10.3. Project Monthly Reporting

Monthly reports shall be compiled by the Project Manager with inputs from consultants, contractors and functional leads. The cut-off date for monthly reports is the last calendar day of the month. Monthly reports will be published on the seventh business day of the following month. As well as presenting the data, there will be commentary on variance across the period and areas of concern and areas to focus upon in the coming periods.

Cost control inputs to the monthly report include:

- A Level 1 Cost Report;
- A Level 2 Cost Teport;
- A Trend and Scope Change Register;
- Graphical representation of incurred, committed and forecast final cost curves;
- Contingency status; and
- Project dashboard.

Schedule inputs to the monthly report include:

- Key milestone tables;
- Critical path analysis;

- Project progress curves;
- Level 1 Schedule; and
- Level 3 Lookahead Schedule.

10.4. Lead Indicator Reporting

Reporting can tend to be focused on displaying information that has happened in the past, so it is important in project controls to be forward focused to help guide the Project Team to concentrate on the high impact areas. The Project Controls Forecast in both cost and schedule are good examples of forward-looking reporting and the associated commentary helps focus on the important areas.

More lead indicator reports will be developed, where needed, to give early indications of whether the Project is remaining on track. Early in the Project, a base set of early indicator reports will be developed, and these will be reviewed and updated regularly throughout the Project to help provide early indication of various aspects of Project performance.

Some examples of possible lead indicator reports include:

- Engineering deliverables leading to procurement;
- Certification rates for onboarding personnel;
- Request for information response times; and
- Trend and change decision response times.

11. Engineering

11.1. Engineering Strategy

11.1.1. Engineering Management

All detailed design and regulatory sign off shall be performed by approved contractors engaged to provide engineering services for the Project. While direct responsibility for design will not be performed by EQR personnel, in order to achieve a cohesive Project outcome that meets EQR's requirements, the EQR Owner's Team will be required to manage the engineering process undertaken by others. The Owner's Team responsibilities include:

- Coordinate the engineering and technical reviews such as functional, safety in design and risk reviews;
- Coordinate engineering interfacing for engineering progress measurement schedule and reporting;
- Manage and coordinate the engineering deliverables, schedule and budget from the key packages;
- Input into the Project monthly report with respect to design progress, change management, schedule and costs;
- Provide leadership, direction and supervision of the key packages;
- Manage and record the technical and engineering related changes and assumptions within the key packages;
- Coordinate the interface management across functions and key packages at and across defined battery limits;
- Ensure the timely supply of engineering related information and reporting; and
- Ensure engineering activities comply with the SHMS.

11.1.2. Engineering and Technical Standards

EQR will rely on the provision of engineering standards by the engineering consultants. The Project Manager will review and ensure the suitability of the standards in reviewing compliance with the existing site systems in consultation with the SSE.

11.1.3. Engineering Management Meetings

Engineering management meetings shall be held fortnightly with each of the consultants and contractors, the objective is to manage and actively coordinate the various issues associated with the engineering effort. Topics typically reviewed in these meetings include:

- Safety;
- Project engineering management issues;
- Review of progress against schedule;
- Review of manhours against budgets;
- Scope review and change management;
- Review of technical and management issues;
- Review of resource requirements;
- Quality performance issues;
- Document control issues;

- Design issues and design for safety issues;
- Interface issues and concerns; and
- General matters.

11.2. Engineering Roles

11.2.1. Engineering Manager

The Engineering Manager will ensure consistency of engineering philosophy and specifications is maintained across the various contract packages. Additional assistance may be required from specialist third parties for technical input. The key responsibilities for the Engineering Manager include:

- Accountable for discipline specifications, standards, processes, procedures and quality and ensuring consistency of workflows across areas;
- Responsible and accountable for their discipline and inputs to scopes of services, engineering packages, material take offs (MTOs), equipment and vendor lists/packages;
- Responsible for preparing discipline execution plans, design criteria, deliverables lists, budget and progress measurement;
- Responsible for the direction and management of the activities required to progress the design in each area in support of Project controls, schedule, procurement, fabrication, construction, commissioning and start-up phases;
- Ensure that qualified and experienced engineers are assigned to suit the complexity of the task;
- Responsible for change management; and
- Responsible for maintaining schedule and budgets.

11.2.2. Project Engineer

The Project engineers will be responsible to the Project Manager for adequacy and timely delivery of technical outputs in accordance with the Project requirements. They will advise and assist the Project Manager with respect to identification of resources, programming, verification response, budget control and reporting.

11.3. Design Risk Management

Design risk for the Project covers hazard and risk identification, risk assessment and risk control. The design risk is captured in the Project registers and managed by the EQR team and communicated during the engineering management and coordination meetings.

Design risks shall be actively managed throughout the duration of the Project through the risk management system. The Engineering Manager with support from the area Project engineers and area managers shall ensure both EQR design risks and consultant design risks are continually captured and managed.

11.4. Safety in Design

Safety in design (SiD) is critical to the Project. The key objective is to produce a safe design that is well documented and can be easily communicated to those involved.

Design risk management processes must be facilitated by an appropriately qualified person and the Owner's Team will participate in the hazard and risk identification workshops. These shall take place as early as reasonably possible by means of a SiD checklist that covers the following key areas:

- Design;
- Layout;

- Process and chemical;
- Operation and maintenance;
- Mechanical;
- Electrical;
- Structural;
- Civil and geotechnical;
- Sustainability; and
- Construction.

During the workshops a re-evaluation of identified major hazards, along with a review and update of the Risk Register will be required.

Any hazards and risks identified will require analysing, the main analytical tools / techniques used by the consultants and contractors will be:

- Hazard and operability (HAZOP);
- Control hazards and operability (CHAZOP);
- Layer of protection analysis (LOPA);
- Reliability, availability, maintainability, buildability, operability (RAMBO); and
- Construction hazard assessment implication review (CHAIR).

Key deliverables / outputs include:

- Project Risk Register;
- SiD Report;
- Drawings incorporating SiD information;
- 3D model incorporating SiD information; and
- Safety Data Sheets.

Each engineering and design consultant will develop and manage their own risk registers. The Engineering Manager shall be responsible for the collation and management of a Master Engineering Risk Register for the Project.

11.5. Constructability and Preassembly Reviews

11.5.1. Constructability

Constructability is about aligning the design with the construction approach and methodology to optimise the construction effort applied to the Project whilst ensuring quality, safety, capital cost, and construction schedule objectives are realised. The key objectives of the constructability reviews include ensuring the developed design eliminates or minimises construction risks whilst minimising the site construction effort.

Constructability reviews form an integral part of the design process and will be incorporated into the detailed design process.

The engineering consultants will conduct constructability reviews during detailed design including the following:

- Determine the sequence and timing of engineering and design deliverables that align procurement, shop fabrication and delivery of construction bulks, equipment and sub-assemblies with the construction fabrication plan;

- Configure the infrastructure/plant layout and facility access to ensure it provides appropriate construction laydown area, contractor facilities and construction equipment access;
- Ensure construction sequencing of facility systems and sub-systems are aligned with the logical commissioning energisation process; and
- Understanding site access constraints that impact pre-assembly dimensions and weights.

12. Quality Assurance

A Quality Management Plan will be developed for the execution phase that contains the strategy for managing Project quality. Quality assurance principles will be applied to the Project construction activities and their management by EQR. Evidence of complying with the plan will be through internal and external audits of each contractor and of EQR construction management.

Quality control and assurance personnel will be contained in the EQR team.

Specialist quality resources will be engaged on an as required basis.

12.1. Manufacture and Construction

Quality assurance and quality control refers to the ISO9001 requirements and responsibility of the vendors and installation contractors' internal management procedures and compliance, traceability and methods of recording. In addition, the EQR team will play an active part in surveillance and inspection at the various stages of manufacture (both on and off site) and construction.

Each contractor will plan, establish, implement and maintain a quality system and their own Quality Management Plan for all work for this Project that conforms with the EQR Quality Management Plan's requirements.

12.2. Quality Audits

Responsibility for developing, maintaining, distributing, implementing and reviewing the Audit Plan for internal and external audits of the Project lies with the EQR Engineering Manager in accordance with the Quality Management Plan.

The EQR Engineering Manager will conduct or engage quality auditors and schedule them in the audit plan to conduct internal audits on construction management activities and contractors' quality systems and construction performances against their quality systems.

These audits will be scheduled at frequencies based on the program of works.

12.3. Site Quality Control Verification

Construction contracts will specify control of on-site quality through verification activities and use of Inspection and Test Plans (ITPs).

At the conclusion of each package of work a manufacturer's data report will be developed.

Examples of quality management activities include:

- Verify the process of independent testing against the ITPs is being managed and that the outcomes are being acted upon;
- Verify the processes for inspection of and management of materials at site is being conducted in accordance with agreed processes;
- Verify the appropriate expediting of documentation, materials and services procedures are in place and being used effectively;
- Verify that submittal of specific quality plans and ITPs by each contractor prior to the start of work is occurring per agreed procedures;
- Verify that all parties on the Project are complying with drawings, specifications, codes and regulations;
- Validate that the management of non-conformances and corrective action is planned, taken and monitored; and

- Verify that proper quality monitoring documentation is kept and transferred to EQR at handover.

Verifications and ITPs will cover examples such as:

- Third party verification;
- Hold, witness and verification points;
- Weld procedures and welder qualifications;
- Non-destructive testing;
- Concrete test certificates;
- Compaction records;
- Use of visual indicators to verify completion;
- Torque verification; and
- Commissioning.

12.4. As Built Drawings

When the installed facilities and equipment that have been installed during construction and commissioning deviates from the detail set out in the “Approved for Construction” drawings, the relevant contractors are to mark up their working set of drawings accordingly to reflect the changes. These updated drawings shall be referred to as the ‘As Built Drawings’. At the close-out of each contract, the Owners’ Team will review the ‘As Built’ information and drawings received from contractors to ensure all changes have been clearly identified and detailed. The contractors shall electronically update all ‘As Built Drawings’ and issue to EQR for review and approval within the timeframes stipulated in their contracts.

13. Construction

13.1. Temporary Facilities

13.1.1. Owner's Team Facilities

The Owner's Team will utilise the existing offices and facilities on the site to manage the works.

Opportunity exists to utilise the mining contractor offices prior to the mobilisation of the contract mining workforce if additional space is required.

13.1.2. Contractor's Facilities

Construction contractors will provide their own temporary buildings and facilities at locations agreed by EQR.

The location will consider minimising the footprint and vehicle movements, safe pedestrian movements and optimising communication. It is expected that contractors' facilities will be located adjacent to their work areas where appropriate. Construction contracts will include the removal of contractor's facilities at contract completion.

Preparation of cleared laydown areas for the placement of contractors' offices and facilities will be provided by EQR.

13.2. Water

13.2.1. Construction Water

EQR will provide water for construction from the water dam near TSF4 and the open pit. The contractor will be required to provide the equipment necessary to extract and distribute the water as required. The locations of these points are shown as items 7 and 11 in Figure 4 below.

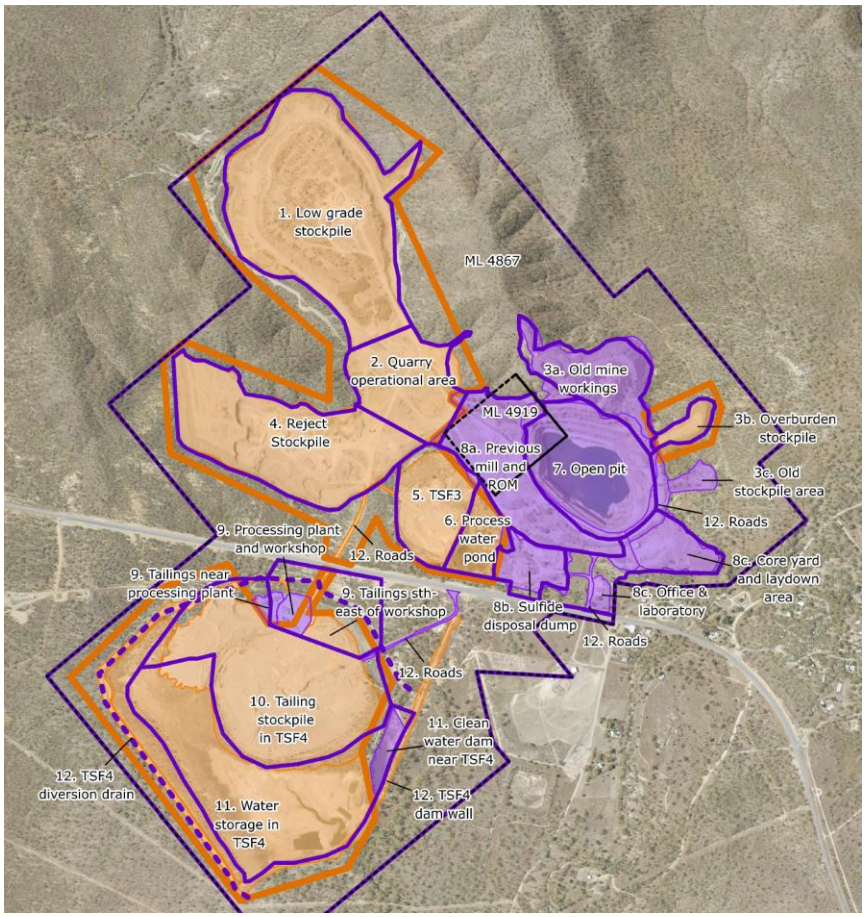


Figure 4: Construction Water Fill Points

13.2.2. Potable Water

Potable water for the Owners' Team is currently trucked to site under the existing potable water agreement and stored in potable water storage tanks. Potable water is to be tested periodically to ensure water quality is maintained.

Contractors are responsible for supplying and storing their own potable water.

13.3. Fuel

The Owner's Team will utilise the existing operations onsite fuel tanks that will be re-filled as required. Contractors are responsible for supplying and safely storing their own fuel.

13.4. Telecommunication, IT, Radios

Wireless communications infrastructure exists to the crushing plant and gravity processing plant. The contractors will be supplied access to this infrastructure. If additional wireless communication range is required to the mining area, EQR will install it for the Project.

The contractors are responsible for connecting their facilities to the wireless communications and any distribution beyond that point.

EQR will specify UHF radio channel frequencies, emergency channel, and range of channels for each of the contractors to use during construction. Contractors are to supply their own radios.

13.5. Materials Management and Warehousing

The EQR Project Team will coordinate the delivery of Company supplied items to site with the relevant contractor. It will be the contractors' responsibility for acceptance, inspection, unloading and recording, storage and preservation of the Company supplied items.

As per Section 4.6, contractors will be responsible for the sourcing, logistics, transportation, unloading, storage and management of their materials delivered to the site unless explicitly stated otherwise. This responsibility extends as applicable to materials including:

- Concrete;
- Steelwork and platework;
- Electrical bulk items;
- Electrical and mechanical equipment and instrumentation; and
- Contractor plant and mobile equipment.

Laydown and delivery points will be stipulated either in the contract or prior to delivery to site.

13.6. Construction Completion

A Project Closeout Plan will be developed to describe the management of construction completion and closeout activities. This will cover at a minimum:

- Completion of all inspection test plans and check sheets;
- Completion of punch list items;
- Removal of all temporary facilities and equipment; and
- Completion and handover of agreed deliverable documentation as specified in the scope.

13.7. Commissioning and Handover

When the construction of a system is complete, it will be handed over to the commissioning team for possession and commencement of commissioning activities.

Area completion verification and handover to commissioning will be managed by the Project Manager. Mechanical completion tasks will be detailed and signed off as complete using the contractors approved quality system. Once all mechanical completion tasks are completed, the commissioning team will be notified and will be able to commence their commissioning activities.

The commissioning of the crushing plant will be completed by the selected EPC contractor that designs and constructs it. The commissioning system will be developed by the contractor and approved by EQR.

EQR will supervise the commissioning process and will provide operators to assist with the commissioning. The EPC contractor will train the operators during the commissioning process to ensure a smooth handover between commissioning and operations.

During the execution phase, EQR will develop the Commissioning Management Plan that will clearly define the stages of commissioning and performance requirements required to be achieved by the contractor to allow Project completion and handover of the facility to operations.

The nominal construction and commissioning closeout process is shown below in Figure 5.

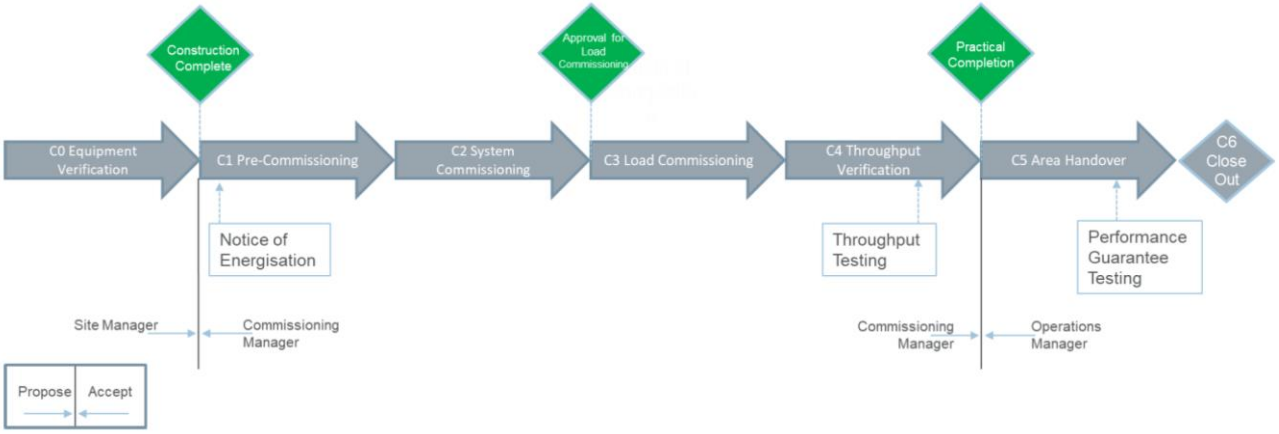


Figure 5: Construction and Commissioning Closeout Process

14. Pre-commissioning and Commissioning

14.1. Commissioning Objectives

Commissioning covers the formal handover and acceptance of mining equipment, process equipment (including commissioning modules), buildings and infrastructure, between the various commissioning stages. This entails the completion of installation by contractors and suppliers, verification of plant and equipment, precommissioning by field and design engineers, and final commissioning by the commissioning team in conjunction with the operations personnel at the conclusion of area handover.

The objectives of formal commissioning are:

- To ensure zero harm is maintained;
- To ensure commissioning is completed in an orderly manner;
- To ensure all permits and isolation systems for transition from 'Plant Dead' to 'Plant Live' are defined and adhered to;
- To clarify and define the various phases of handover, the different parties involved, and their responsibilities at each stage; and
- To achieve plant performance acceptance criteria, demonstrated by performance and documents.

14.2. Commissioning Areas

Commissioning has been split into two main areas:

- Gravity Processing Plant; and
- Crushing, Screening and XRT Sorting Plant.

Each area is made up of a group of integrated items of plant and equipment that can be operated as a standalone unit. Test packs are combined into functional commissioning areas that are either discipline related (i.e. electrical) or process interrelated.

14.3. Commissioning Strategy

14.3.1. Gravity Processing Plant

The gravity processing plant works are an upgrade to an existing facility that is currently operated by EQR personnel. Due the style of work being the addition of equipment to existing circuits and EQR operations personnel knowledge of the system, the EQR operations personnel will directly manage the commissioning of the new processing plant.

The style of work required for the commissioning is very similar in nature to the work that has been undertaken during EQR's management of Mt Carbine and numerous process upgrades have already been undertaken and commissioned directly by EQR personnel.

14.3.2. Crushing Plant

The crushing plant is effectively a stand-alone, greenfield project on the site, that ties into the gravity processing plant. Due to the EPC contract nature of the delivery, the EPC contractor delivering the crushing plant is required to provide performance guarantees for the system which are further described in Section 14.4. In order for the EPC contractor to demonstrate the system's performance and to minimise the possibility of external interference, the EPC contractor shall perform the commissioning of the crushing plant until the plant has been accepted and handed over to the EQR operations team.

14.4. Commissioning and Handover Process

The commissioning process that the Project will use is summarised by the time-based sequence of activities outlined in Figure 5 in Section 13.7.

This model provides the framework for EQR's commissioning procedures. Individual components of the system are described in Table 8.

This process applies to the crushing plant, but as EQR shall directly manage the commissioning of the gravity processing plant, the handover process does not apply in that instance.

Table 8: Stages of Commissioning

Stage	Description	Typical Commissioning Activities
C0: Verification of Plant and Equipment	Confirmation of equipment delivered to site. Construction has been completed as per the scope of works, including IFC drawings.	• Verification check sheets are completed to confirm that construction is completed to the required standards. • Factory acceptance testing, as applicable. • Approvals gained from relevant electrical authority prior to connection to the external grid. • Fire protection systems (or an appropriate contingency) are in place. • No equipment is operated under power during this stage, with the exclusion of off-site factory acceptance testing. • Specific equipment or areas handed over to control of Commissioning Manager.
C1: Precommissioning	Initial energisation and testing of individual equipment.	• Confirmation of control systems. • Approval for energisation. • Motor directional testing (drives decoupled, as required). • Vibration and temperature monitoring. • Valve operation confirmed. • Equipment familiarisation commenced with the operations team. • Water may be required for the cooling of drives, and for protection of mechanical seals for direction testing.
C2: System Commissioning	Testing of equipment in subsystems.	• Energisation and the introduction of all services required to operate. • Water is introduced under no-load operating conditions. • Confirmation of all dust-suppression equipment. • Instrumentation (pressure gauges, limit switches, level sensors) is verified. • First fills in the lubrication bay, and confirmation of operation of distribution equipment. • Integrated control loops are checked on systems. • All critical punchlist items are completed. • No steady-state load is applied to the equipment at this stage.

Stage	Description	Typical Commissioning Activities
C3: Load Commissioning	Load is introduced to the system, and the entire system is tested in sequence.	• Load is introduced to the system. • Instrumentation is recalibrated under load, where required. • Ore and reagents are introduced to the plant. • Operations team continue training on equipment under load conditions.
C4: Throughput Verification	The entire system is tested in sequence under normal load.	• The entire system is tested in operation under normal conditions. • The equipment is verified as being able to operate at the nominal throughput rate (or at an alternate rate, determined by contractual agreement, to achieve practical completion). • Practical completion for significant sub-Project areas is confirmed at the successful conclusion of this stage.
C5: Area Handover	The equipment is verified to be operating at the required performance level.	• The equipment is verified to be operating at the required performance level. • Performance guarantee testing is completed and verified. • Closeout of all punchlist items, as per agreed categories. • All testing documentation is complete and submitted. • Area control formally handed over to Operations team.
C6: Commissioning Closeout	Commissioning Closeout Report is submitted.	• All commissioning documentation completed, submitted and handed over to the Operations team. • Commissioning Closeout Report submitted for each area. This details issues encountered, and rectification works completed during commissioning.

14.5. Commissioning Organisational Structure

14.5.1. Owner's Commissioning Team

The Project Manager will be responsible for the coordination of the commissioning. The Project Manager will be supported by the EQR operations team to manage the SMP and electrical contractors in the execution of the commissioning activities.

The designers for the respective plants will be tasked with providing the necessary commissioning sheets and tools to assist in carrying out the works.

14.6. Commissioning Safety and Risk Management

Commissioning risk management will be managed in accordance with the site's SHMS. SHMS is applicable for all works conducted on site, including all commissioning activities, unless otherwise agreed and approved by the Project Manager and the SSE.

14.6.1. Approach

A specific Commissioning Risk Management Plan will be implemented in order to identify, minimise, and manage risk during commissioning of the works. Risk associated with commissioning preparation, the various commissioning stages, and the seamless transfer to operations will be addressed. The Risk Management Plan will ensure that the risks are fully understood, and that risk ownership is designated to the party best able to manage and resolve them. The site-wide Risk Register will be adopted for commissioning.

14.6.2. Risk Workshops and Assessments

Before commissioning commences, a risk workshop involving all parties will be undertaken for all activities. This will ensure that potential risks to personnel and the plant are identified, and that appropriate measures are taken in order to eliminate or mitigate the risk. This will also include a gap analysis of the SHMS to address any areas required for commissioning that the system does not cover.

The risks identified, as well as the actions, will be reviewed prior to each subsequent phase of commissioning. This will ensure that there are no changes or additional risks identified that require attention.

High-level risks that have been identified for consideration:

- Risks involved with introduction of new equipment to site;
- Energisation of equipment for the first time;
- Integration of site power supply with the external network;
- Interaction between concurrent activities across construction, commissioning and operations;
- Traffic management;
- Management of dust during construction and early production activities; and
- Workforce of potentially varying skill level and site experience.

14.7. Commissioning Planning

Commissioning planning will begin in the latter stages of detailed engineering and will be completed prior to mobilisation of commissioning personnel to site.

Planning will cover the following aspects:

- The organisational requirements and resources required, including management, technical, operational, contractor and vendor personnel;
- Feed material quantities, consumables, spares, and specialised equipment and tooling;
- Development of a detailed, project-specific commissioning plan, including:
    - Initiation of the commissioning tracking system;
    - Factory acceptance testing, as appropriate;
    - Equipment verification plans;
    - Commissioning area and process commissioning module breakdowns;
    - Organisation Chart detailing operating and engineering, consultant, and vendor personnel;
    - The Commissioning Schedule;
    - Management of interactions with construction, operations, and other commissioning activities; and
    - Vendor commissioning assistance requirements.
- Preparation and collation of project-specific commissioning documentation, including:

    - Procedures;
    - C1 check sheets;
    - C2 plans and check sheets; and
    - Operating, maintenance, and spare parts manuals for the facilities and equipment.
- Arrangement of a risk assessment that will identify key commissioning risks;
- Preparation of a project-specific commissioning tracking system;
- Identification and procurement of special tools and equipment required to complete commissioning;
- Identification and procurement of special test equipment required in order to make the measurements listed in the commissioning procedures; and
- Identification of requirements for commissioning spares and consumables and arranging the procurement of these items if this has not been organised earlier in the Project.

15. References

- Chapter 1: Executive Summary
- Chapter 4: Mining
- Chapter 5: Processing
- Chapter 6: Infrastructure
- Chapter 10: Environment and Approvals
- Chapter 14: Risk and Opportunity

16. List of Abbreviations

Abbreviation	Description
CHAIR	Construction hazard assessment implication review
CHAZOP	Control hazards and operability
DIDO	Drive in / drive out
E&I	Electrical and instrumentation
EA	Environmental Authority
EPC	Engineer, procure, construct
EQR	EQ Resources Limited
ERA	Environmentally Relevant Activity
FID	Final investment decision
FIFO	Fly in / fly out
HAZOP	Hazard and operability
ITP	Inspection and Test Plan
JSA	Job safety analysis
JSEA	Job safety environmental analysis
LGS	Low grade ore stockpile
LOPA	Layer of protection analysis
MCC	Motor control centre
QURR	Quantity unit rate reports
RAMBO	Reliability, availability, maintainability, buildability, operability
SHMS	Safety and health management system
SiD	Safety in design
SMP	Structural, mechanical, piping
WBS	Work breakdown structure
XRT	X-ray transmission

Appendix A Work Breakdown Structure

Body Text

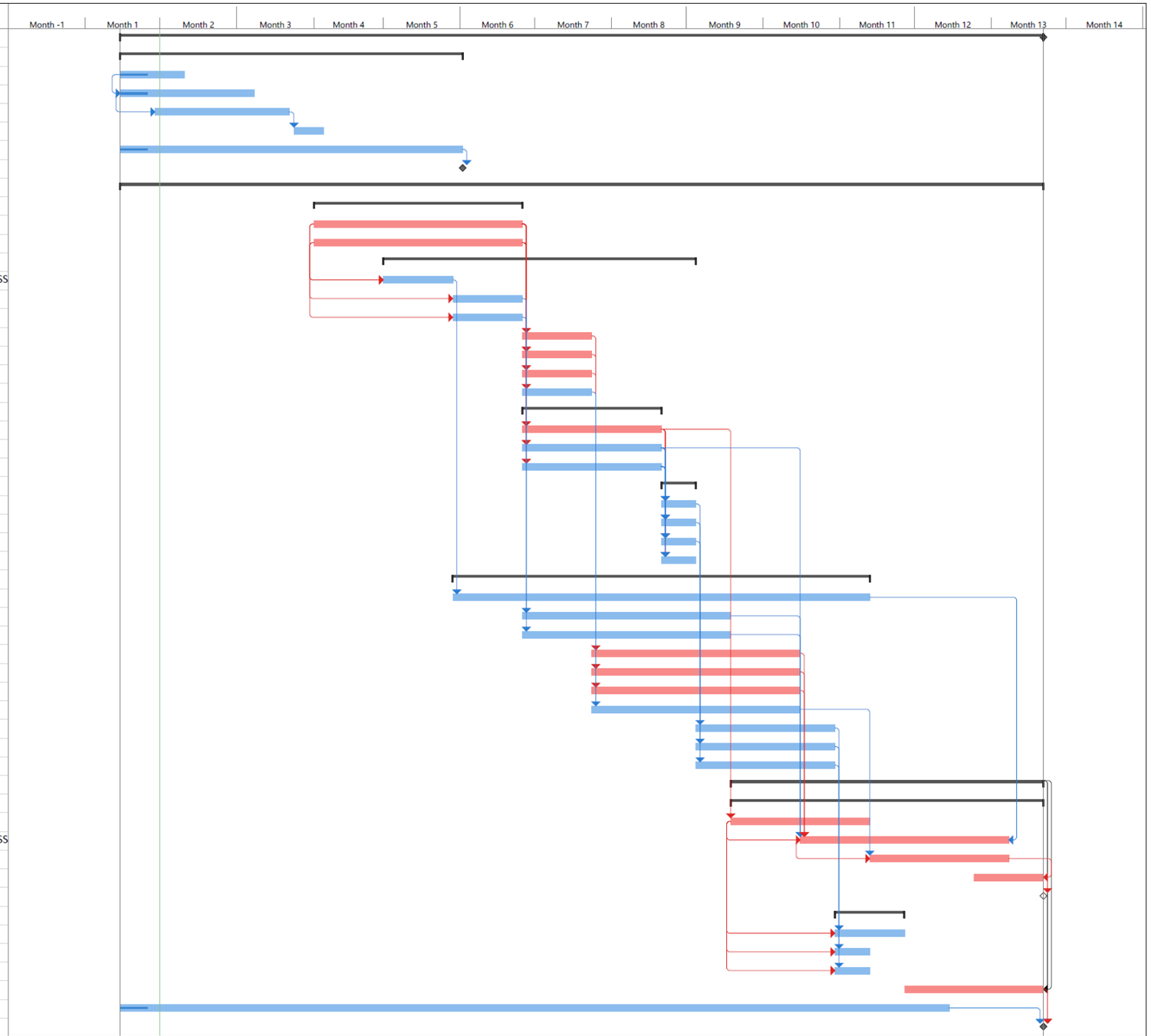
WBS Code	Description	Area Type
10000	**MINING**	**Direct Cost**
11000	Mine Development (Open Cut)	
12000	Mine Development (Underground)	
13000	Mine Development (Mineralised Ore Stockpiles)	
17000	Mobile Equipment	
20000	**PROCESSING**	**Direct Cost**
21000	Crushing Plant	
22000	Sorting Plant	
23000	Wet Processing	
25000	Product Handling, Storage and Transportation	
26000	Reject Handling, Storage and Transportation	
30000	**ON-SITE INFRASTRUCTURE**	**Direct Cost**
31000	**Civil Infrastructure**	
31100	Roads	
31200	Pads and Laydown Areas	
31300	Dams and Drainage	
32000	**Surface Services and Utilities**	
32100	Power Supply and Distribution	
32200	Water Services	
32300	Air Services	
32400	Fuel and Lube Facilities and Distribution	
32500	Communications	
33000	**Underground Services and Utilities**	
34000	**Mine Industrial Area and Mine Facilities**	
34100	Explosives Storage	
34200	Workshops and Warehousing	
34300	Mine Buildings	
40000	**OFF-SITE INFRASTRUCTURE**	**Direct Cost**
41000	Access Roads (off-site)	
42000	Power Supply	
43000	Water Supply	
44000	Communications	
70000	**PROJECT INDIRECTS**	**Indirect Cost**
71000	**Construction Facilities**	
71100	Temporary Buildings	
71200	Construction Plants	
71300	Temporary Utilities	
71400	Temporary Transportation Facilities	

WBS Code	Description	Area Type
71500	Weather Protection	
71600	General Purpose Scaffolding, Cribbing & Dunnage	
71700	Minor Temporary Construction	
71800	Roads, Bays, Parking Areas, Laydown Areas	
72000	**Construction Support**	
72100	Operation & Maintenance Of Construction Facilities & Utilities	
72200	Construction Material Handling and Warehousing	
72300	On-Site Services	
72400	Pre-Operational & Commissioning Assistance	
72500	First Fills and Spares	
72600	Construction Labour Services	
72900	General & Final Clean Up	
73000	**Construction Equipment, Tools And Supplies**	
73100	Construction Equipment & Light Vehicles (Including maintenance)	
73200	Tools & Consumables	
73300	Fuels And Lubricants	
74000	**Material Transportation to Site**	
74100	Ocean Freight	
74200	Air Freight	
74300	Customs Duties And Agent Expenses	
74400	Marshalling And Consolidation	
74500	Inland Freight	
74600	Demurrage	
75000	**Project Accommodation**	
76000	**Contrator Labour Indirects**	
76100	Project Home Office Labour (Off-site)	
76200	Project Contruction Labour (On-Site)	
76300	Construction Expenses / Overheads / Fees	
80000	**OWNER'S COSTS**	**Indirect Cost**
81000	**Owner's Labour Costs**	
81100	Project Management	
81200	Engineering Management	
81300	Engineering & Design	
81400	Construction Management	
81500	Commissioning	
81600	Project Administration	
81700	Project Services	
81800	Consultants & 3rd Parties	
81900	Operations Support	
82000	**Project Expenses**	
82100	Office Expenses	
82200	Travel	

WBS Code	Description	Area Type
82300	Accommodation	
82400	Recruitment & HR Expenses	
82500	Courier & transport costs	
82600	Owner's Overhead distributables	
83000	**Insurance, Duties, Taxes, etc.**	
83100	Insurance	
83200	Customs and duties	
83300	Permits	
83400	Legal Fees	
90000	**ESCALATION AND CONTINGENCY**	**Indirect Cost**
91000	Escalation	
92000	Contingency	
93000	Foreign Currency Exchange	

Appendix B Execution Schedule

ID	Task Name	Duration	Predecessors
1	**Mt Carbine Upgrade Project**	**266 days**	
2	**Phase 1**	**100 days**	
3	Engineering	1 mon	
4	Procurement	2 mons	3SS
5	Construction	2 mons	4SS+2 wks
6	Commissioning	2 wks	5
7	Phase 1 Approvals	5 mons	
8	Phase 1 Complete	0 days	7
9	**Phase 2**	**266 days**	
10	**Engineering**	**60 days**	
11	Crushing, Screening and Sorting	3 mons	
12	Process Plant	3 mons	
13	**Procurement**	**90 days**	
14	Long Lead Equipment	1 mon	11SS+1 mon,12SS
15	Crushing Plant Equipment	1 mon	11SS+2 mons
16	Process Plant Equipment	1 mon	12SS+2 mons
17	Steelwork	1 mon	11,12
18	Platework	1 mon	11,12
19	Pipework	1 mon	11,12
20	Electrical and Instrumentation	1 mon	11,12
21	**Construction Contractors**	**40 days**	
22	Concrete Contractor	2 mons	11,12
23	SMP Contractor	2 mons	11,12
24	Electrical and Instrumentation Contractor	2 mons	11,12
25	**Site Infrastructure**	**10 days**	
26	Core Shed	2 wks	22,23,24
27	Contractor Offices	2 wks	22,23,24
28	Contractor Igloo Workshop	2 wks	22,23,24
29	Builder - Administration Building Renovation	2 wks	22,23,24
30	**Fabrication and Delivery**	**120 days**	
31	Long Lead Equipment	6 mons	14
32	Crushing Plant Equipment	3 mons	15
33	Process Plant Equipment	3 mons	16
34	Steelwork	3 mons	17
35	Platework	3 mons	18
36	Pipework	3 mons	19
37	Electrical and Instrumentation	3 mons	20
38	Core Shed	2 mons	26
39	Contractor Offices	2 mons	27
40	Contractor Igloo Workshop	2 mons	28
41	**Construction and Commissioning**	**90 days**	
42	**Crushing Plant and Process Plant**	**90 days**	
43	Concrete Installation	2 mons	22FS+1 mon
44	SMP Installation	3 mons	23FS+1 mon,43SS
45	Electrical and Instrumentation Installation	2 mons	37,44SS+1 mon
46	Commissioning	1 mon	45FF+2 wks
47	Crushing and Processing Plant Construction Complete	0 days	46
48	**Site Infrastructure**	**20 days**	
49	Core Shed	4 wks	38,43SS+1 mon
50	Contractor Offices	2 wks	39,43SS+1 mon
51	Contractor Igloo Workshop	2 wks	40,43SS+1 mon
52	Open Pit Mining Preparation and Mobilisation	2 mons	41FF
53	Approvals	12 mons	
54	Open Pit Mining Commencement	0 days	41,52,53



Project: BFS Level 2 Execution S
Date: Wed 1/12/21

Task | Summary | Inactive Milestone | Duration-only | Start-only | External Milestone | Critical Split
Split | Project Summary | Inactive Summary | Manual Summary Rollup | Finish-only | Deadline | Progress
Milestone | Inactive Task | Manual Task | Manual Summary | External Tasks | Critical | Manual Progress

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REGISTERED OFFICE:

Level 4, 100 Albert Road, South Melbourne, VIC 3205

ABN: 77 115 009 106 (ASX: EQR)

T: (07) 4094 3072

F: (07) 4094 3036

W: eqresources.com.au