CARRAPATEENA

Sub-Level Cave Pre-Feasibility Study

November 2016

EXECUTIVE SUMMARY

ACKNOWLEDGEMENTS

The Kokatha People have a direct, unbroken and unique relationship with the land on which the Carrapateena Project is located.

OZ Minerals recognises that the sense of place and belonging of the Kokatha People is linked to their identity, creation stories, travel, trade, ceremonies, family and places held sacred. We recognise the deep and ongoing feelings of relationship and attachment they hold for their lands.

OZ Minerals acknowledges Kokatha connection to 'country', the contribution of Kokatha People to their region and the enduring importance to Kokatha People of values, cultural authority, cultural norms and customary laws.

OZ Minerals places great value on our relationship with the Kokatha People. OZ Minerals and Kokatha Aboriginal Corporation seek to work in partnership, as equals, to further develop the Partnering Agreement Nganampa palyanku kanyintjaku 'Keeping the future good for all of us'. The collaborative partnering agreement encapsulates, recognises and values the ongoing contribution of both partners, and will inform the relationship between Kokatha and OZ Minerals throughout and beyond the development of the Carrapateena Project.

OZ Minerals would also like to thank the following external organisations for their contribution and support in the development of this Pre-Feasibility Study:

- AMC Mining Consultants
- GR Engineering Services Ltd
- AECOM
- SMEC
- Golder Associates

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1 EXECUTIVE SUMMARY AND RECOMMENDATIONS

1.1 Key Highlights

This Pre-Feasibility Study considers the development of the Carrapateena orebody and builds upon an extensive library of prior work. It concludes that development of the orebody is technically achievable and the study presents a viable business case for development. The study goes on to define the technical and commercial characteristics of the business case, the development execution strategy and the associated risk profile.

In summary, the key features are:

Carrapateena Project

- The Project is owned 100% by OZ Minerals Limited through its fully owned subsidiaries.
- Supportive and encouraging traditional landowners, local community and State Government.
- A 4 million tonnes per annum (Mtpa) sub-level cave mining operation with an average copper equivalent grade of 2.31% in ore milled.
- A conventional copper concentration processing plant producing an estimated average of 66,000 tonnes of copper and 82,000 ounces of gold per annum for the first three years of full production.
- An estimated average Life of Mine annual production of 61,000 tonnes of copper and 63,000 ounces of gold.
- Initial C1 cash costs of US$0.50/lb in the first three years of full production and US$0.82/lb Life of Mine.
- A pre-production capital investment of approximately A$830 million.
- Life of Mine net cash flow of A$3.6 billion at consensus commodity pricing over a 20-plus year mine life.
- A short four-year capital payback from start of production.
- An acceptable risk profile featuring a number of significant potential opportunities.
- A fast-tracked development program to enable first production by Q2 2019.
- Preserved operational expansion and mine life extension optionality.
- PFS based on a deliverable operational ramp-up schedule, which will see capital spent earlier and production ramp-up slower in order to ensure that we provide more upside opportunity and less downside risk.

Concentrate Treatment Plant (CTP)

- A pre-production capital investment of ~A$150 million assuming production capacity of 150 000 tonnes per annum of copper concentrate.
- An ability to produce a concentrate with contained copper between 50% and 60% with reduced impurities.

The combined pre-production capital investment for both the Carrapateena Project and the CTP is approximately A$980 million with an estimated IRR of 20%.

1.2 Introduction

OZ Minerals is a Modern Mining Company that unlocks value through innovative thinking, excellence in mining and metallurgical processing, trusted relationships and exceptional social performance.

Being 'modern' means that we adapt to our ever-changing environment, harness the innovative ideas of our people, and collaborate internally to support one another as well as externally to leverage the experience and knowledge of our peers, partners and other industries.

The Carrapateena Project and CTP envisioned in this study is a new generation copper mine of interconnected people, equipment and operations featuring seamless communications throughout. All personnel, mobile equipment and key fixed plant will be digitally tagged and have advanced communications technology to allow transmission of current operating conditions. This access to data and the enabled level of control will provide:

- **Improved Safety** – Personnel and equipment monitoring will enable a reduced interaction risk. There will also be instantaneous monitoring of the environment to provide improved work conditions and monitoring of lone workers.
- **Improved Tele-Presence** – Reliable communications and equipment location information will enable an increased reliance of remote and autonomous operations to significantly reduce personnel exposure hazard and operational downtime, resulting in an improved unit cost.
- **Improved Productivity** – Instantaneous information feedback tied to Closed-Loop and Short-Term Interval Control algorithms will allow immediate response to unplanned events, capturing of transient opportunities, forecasting of impending breakdowns and expediting of servicing and repairs.

This vision will bring to mining operations the benefits already seen in manufacturing and production environments and result in the delivery of a major change in productivity and efficiency, as is being demonstrated in other advanced industries around the world.

1.3 Context

Located in South Australia's highly prospective Gawler Craton, Carrapateena is approximately 160 km north of Port Augusta. The Carrapateena area comprises 11 exploration licences covering approximately 3,600 km^2 in central South Australia on the eastern margin of the Gawler Craton (**Carrapateena Tenements**).

The Carrapateena Tenements were purchased by OZ Minerals in 2011 and a subsequent drilling program significantly increased the resource base.

In August 2014, a Pre-Feasibility Study was completed for Carrapateena defining a technically viable large-scale project treating over 12 Mtpa of ore from a block cave mine.

During the course of 2015, a number of studies were undertaken to define a more compelling economic development case for the Carrapateena Tenements. This became the focus of a scoping study undertaken in early 2016 to assess alternative mining options and production rates (**Scoping Study**).

The Scoping Study assessed many different options, including different mining rates of from 2.0 Mtpa to 4.8 Mtpa, shaft versus decline mine access, truck versus conveyor ore haulage, and sub-level cave versus open stoping mining methods. That study concluded that a 4 Mtpa sub-level cave mine development with decline access and conveyor ore haulage is the preferred development case, with the following key benefits:

- Superior financial return
- Reduced risk profile relative to other development options
- Significantly lower preproduction capital than the block cave options
- Increased flexibility and scalability to expand and shrink mining inventory through Life of Mine
- Ease of funding from cash and expected future cash flows from Prominent Hill.

The progression of study work for the Carrapateena Tenements and the level of definition of the development case is summarised in Figure 1.1.

Timeframe	Aug-14	Feb-16	May-16	Oct-16
SCOPE	12 Mtpa Block Cave	2.8 Mtpa SLC	4.0 Mtpa SLC	4.0 Mtpa SLC
Definition	PFS (-12%+29%)	SS (-5%+20%)	SS (-5%+20%)	PFS (-4%+11%)
CAPEX (A$ million)	A$2,820	A$770	A$975	A$980
NPV (9.5) @ consensus	A$1,150	A$600	A$750	A$770
IRR @ consensus	13%	24%	25%	20%
Geotechnical	Block Caving	SLC	SLC	SLC Decline Underway
Resource	99% Indicated	99% Indicated	99% Indicated	99% Indicated
Uranium in Con	No Hydromet	Concentrate Treatment Plant		
Funding	A$3b Required	Current cash balance and future cashflows from Prominent Hill		
Land Access	Large Footprint	Smaller Footprint	KAC Partnership	KAC Partnership
Approvals	RL 127 Approved	RL 127 Approved	ML Docs in Prep	ML Community Consult
Power	150 MW	55 MW CTP Onsite	55 MW CTP Offsite	Negotiations Underway
Water	35 ML/day	6 ML/day	8 ML/day	8 ML/day required 5 ML/day local source identified

Red = High Risk, Amber = Medium Risk, Green = Low Risk

Figure 1.1: Carrapateena and CTP Definition Progress

OZ Minerals uses market consensus pricing and exchange rates to assess projects. The consensus commodity price assumptions used for the basis of this PFS are listed in Table 1.1.

Table 1.1: Commodity Price Assumptions

Commodity	Period	Aug-14	Feb-16	May-16	Oct-16
Copper (USc/lb)	2019		2.81	2.67	2.53
	2020		3.10	3.00	2.85
	2021+	3.20	3.00	2.99	**2.87 (LOM)**
Gold (US$/oz)	2019		1285	1291	1339
	2020		1300	1322	1353
	2021+	1225	1250	1292	**1226 (LOM)**
Silver (US$/oz)	2019		19	18	19
	2020		19	19	20
	2021+	21	19	19	**19 (LOM)**
AUD:USD	2019		0.72	0.73	0.73
	2020		0.74	0.75	0.74
	2021+	0.82	0.74	0.75	**0.75 (LOM)**

In addition to the recent study work, parallel activities have been undertaken to reduce Project risk and expedite development. These include:

- Partnership agreement with the Kokatha people.
- Native Title Mining Agreement negotiations.
- Submission of various statutory lease applications to support onsite development.
- Project awareness campaigns with regional communities and industry groups, as well as South Australian and regional government bodies.
- Negotiations and technical work in regard to options for power supply network access.
- Exploratory and production testing of prospective water bore locations.
- Award of an exploration decline access development contract and commencement of the decline.
- Metallurgical test work to confirm process design criteria.
- Further resource definition drilling and sampling to confirm orebody characteristics.
- Development of a technical and commercial package suitable for seeking bids for the Engineering, Procurement and Construction (EPC) of a minerals processing plant. (It is anticipated that bids will be called before the end of 2016.)

Alternative options to finance the Project are being considered (including internal cash resources). These options are supported by noting that OZ Minerals had over A$500 million cash on hand and over A$150 million in receivables as at end of Q3 2016. A decision on the preferred financing option(s) will be determined by the end of 2017.

1.4 Pre-Feasibility Study Objectives

The principal objectives of the Carrapateena Pre-Feasibility Study (**PFS**) are summarised below:

Carrapateena Project

- Maximise the value generated by the resource (as measured by NPV, IRR, Capital Intensity and Payback Period), while minimising execution risks for the benefit of all stakeholders.
- Build upon prior study work to identify gaps and flaws in the option(s) presented.
- Assess the likely technical and economic viability of the Carrapateena Project.
- Conduct studies, engineering and investigative work to determine if a sound business case remains after deeper interrogation.
- Define the preferred mining, processing, infrastructure, development and operational configuration for development in accordance with the OZ Minerals Project Development Framework.
- Outline the features of the recommended Carrapateena Project.
- Determine the risk profile of the Carrapateena Project.
- Determine the work plan, estimated costs and schedule for subsequent stages of development.

These objectives have been achieved and the outcomes summarised in the Section 1.5 below.

CTP

This PFS does not expand further on the analysis carried out on the CTP in the Scoping Study results released in May 2016. The CTP will be the subject of further analysis in the Feasibility Study to be released in 2017. This PFS incorporates the financial assumptions and findings of the CTP as set out in the Scoping Study announced in May 2016.

1.5 Summary Outcomes

The PFS has demonstrated that the Carrapateena Project is both technically and financially viable, with a risk and opportunity profile that is competitive with, or better than, other global long-life copper assets at a similar stage of development. The PFS has affirmed the outcomes of the Scoping Study.

Key features of the Carrapateena Project are:

- A low-risk jurisdiction relative to other parts of the world, with a stable and well-understood regulatory environment, and an encouraging state government.
- An executed non-binding Partnering Agreement and Native Title Mining Agreement well advanced with the Kokatha People, the traditional owners of the land.
- Supportive stakeholders and community.
- An access decline underway.
- Confirmation of sufficient power availability from the state electricity grid.
- Further work underway to identify a secure water source in close proximity to the operations – with 60% of requirements already found.
- Good infrastructure when compared to other jurisdictions, with close access to power, water, roads, ports and a skilled labour market.
- A sub-level cave mine delivering 4 Mtpa of ore with an average copper equivalent grade of 2.31%.
- A processing plant with high metal recoveries at estimated rates of 91% and 73% for copper and gold respectively.
- Production of a high grade copper-gold concentrate of an estimated 30%–40% copper over Life of Mine.
- Optionality to upgrade to premium concentrate of approximately 50%–60% copper with lower impurities when processed though the proposed CTP.

1.6 Location

The Carrapateena Project site is located in South Australia, north of the regional centre of Port Augusta, and south-east of both the BHP Billiton Olympic Dam Site and the OZ Minerals copper-gold mine at Prominent Hill (as shown in Figure 1.2). The Carrapateena Project site is located outside the Woomera Prohibited Area and is therefore not subject to any access or ownership conditions.

The Carrapateena Project site is currently accessed via a turn-off from the Stuart Highway located 75 km from Port Augusta. The access road is graded and unsealed, and runs 90 km from the Stuart Highway turn-off to the site location.

A new site access road is proposed running 50 km south-west from the site to the Stuart Highway, parallel to the proposed high voltage transmission line connection to the state electricity network near Mt Gunson.

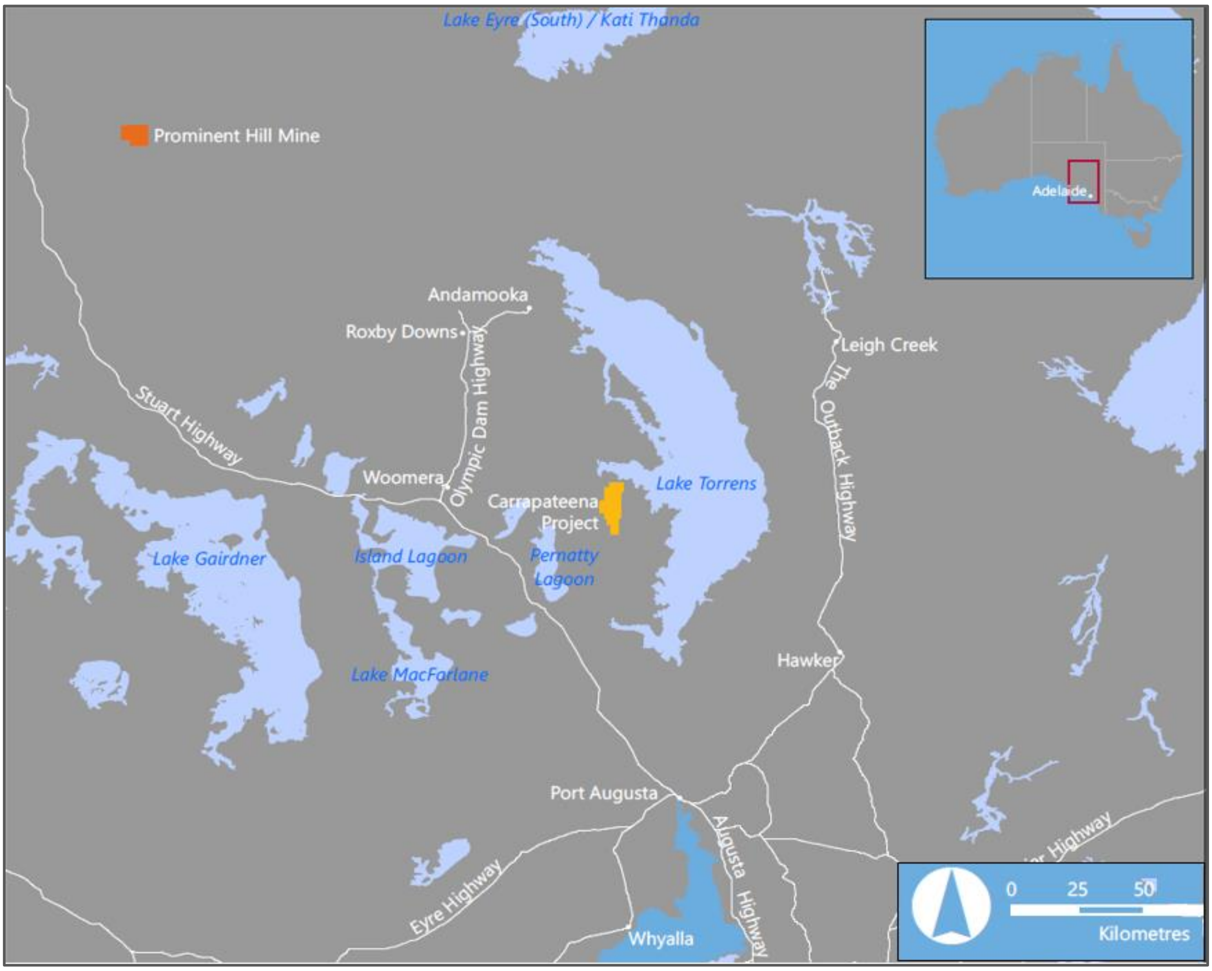

Figure 1.2: Carrapateena Project Location

1.7 Carrapateena Project Overview

The Carrapateena Project base case developed as a result of the PFS is a sub-level cave (**SLC**) mining operation with a nominal production rate of 4 Mtpa. This case was selected on the basis of:

- A project size delivering favourable economics whilst optimising project NPV and IRR with capital cost and project risk.
- Technically feasible using proven mining and processing methods.

- Within the ability of OZ Minerals to finance the Carrapateena Project and CTP from cash reserves and forecast cash flows from existing operations if required.
- A simple project configuration comprising:
  - Single decline mine access with an ore conveyor
  - Conventional copper concentrator plant
  - Close access to infrastructure.
- Within the transmission capacity of the nearest state electricity network connection.

The Carrapateena Project will produce a marketable copper-gold concentrate using a conventional crushing, grinding and flotation circuit. Further processing to premium grade concentrate with reduced impurities is proposed via the CTP located off site.

The CTP process is designed to increase the grade of the concentrate and lower the impurities. This process will:

- Produce concentrate with a premium copper content for the world market.
- Reduce freight, penalties and downstream processing costs.
- Reduce the regulatory risk.

Copper concentrate (post treatment in the CTP) will be produced at an average rate of over ~ 100,000 dry Mtpa, with concentrations of copper, gold and silver varying depending on the mineralogy of the ore being processed. Concentrate will ultimately be sold to customers in Australia and overseas.

1.8 Strategic Considerations

The design intent adopted during the PFS and the developed Carrapateena Project configuration is consistent with and supports the strategic direction of OZ Minerals as 'A Modern Mining Company' (as shown in Figure 1.3), including:

- A focus on operational excellence and adaptability through innovation and a lean, agile operating philosophy.
- Generational value creation for the Kokatha People through the Partnering Agreement and the value created through successful delivery of the Carrapateena Project and ongoing operations.
- An operation that is integrated into and prioritises the Upper Spencer Gulf, Outback Communities and South Australia, ensuring value creation for local communities and greater workforce certainty.
- Incorporation of latest proven technologies to allow remote monitoring and control, autonomous operations and the new possibilities for risk reduction, safety improvement, process optimisation and equipment utilisation that will come from the next wave of technology.

- Latest technology to enable efficient development of the resource to maximise benefits to all stakeholders.
- Collaboration internally across business units and externally with our peers, partners and other industries to allow a learning and continuously improving operation.
- A devolved operating model that:
  - Empowers Carrapateena operations to make the necessary decisions in order to achieve outcomes for which they are accountable, and the responsibility for delivery against an agreed business plan;
  - Obligates the corporate centre to set strategy, approve asset and project plans, guide delivery and govern performance.
- Fit for purpose execution, delivery and operational strategies with a considered allocation of risk.
- Leveraging opportunities to secure people, equipment and services during the current mining cycle.

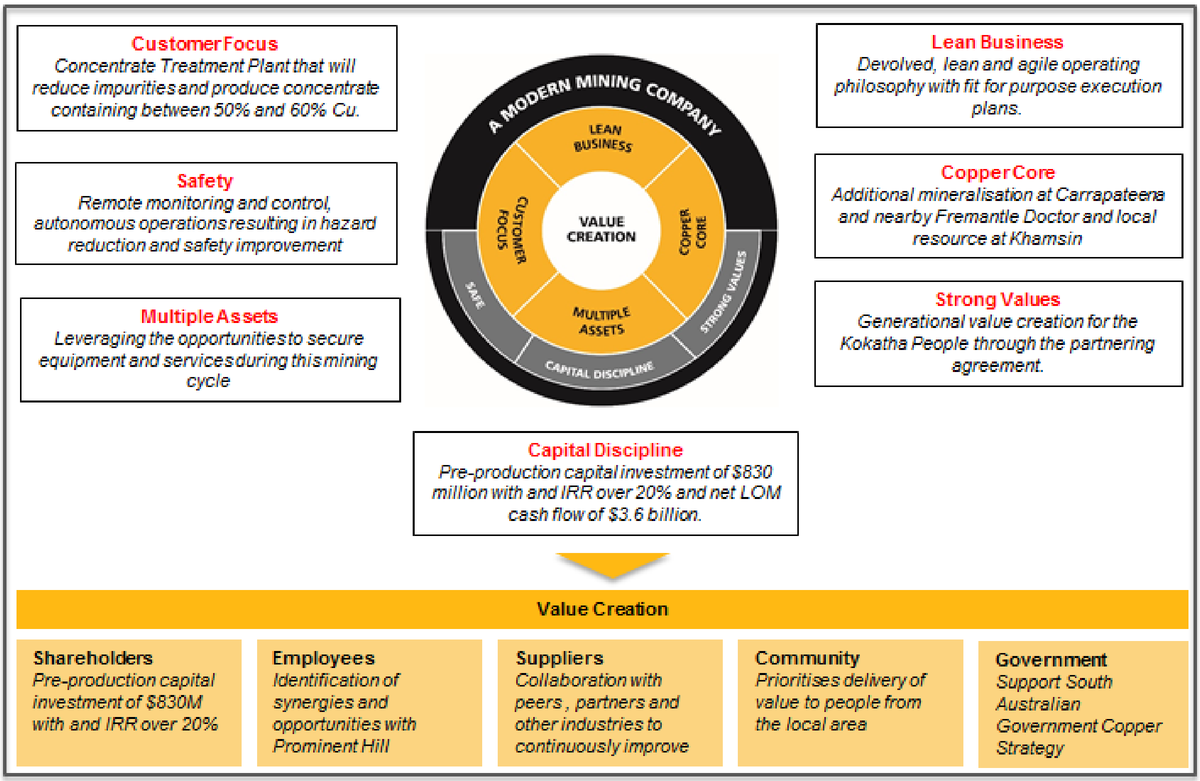

Figure 1.3: OZ Minerals' 'Modern Mining Company' Strategy

1.9 Key Technical Features

A summary of the key technical features of the Carrapateena Project are provided in Table 1.2.

Table 1.2: Carrapateena Project Features

Area	Sub-Area	Feature
Mining	Primary mining method	Sub-level cave
	Production rate / life	4 Mtpa (ROM Ore) / 20-plus years
	Main access	Decline (ramp)
Mine Infrastructure	Primary crushing	Underground
	Ore handling	Incline conveying
Processing	Product	Copper and gold in concentrate
	Production rate	Average of ~61,000 tonnes copper and ~63,000 ounces gold per year Life of Mine
	Comminution	SAG Mill, Ball Mill and Pebble Crushing
	Flotation	Rougher flotation followed by three-stage cleaning
Tailings	Tailings disposal	Valley fill thickened tailings storage facility
Waste Handling	Putrescible, Recyclable, Hydrocarbon and Other Waste Handling	Facilities for each, segregated and located on site
Infrastructure	Power	132 kV, 55 MW High Voltage connection to SA grid with onsite generation
	Water	Borefield Supply
	Access Road	New access road approx. 50 km to Stuart Highway
	Village	450 person
Logistics	Concentrate transport	Loaded to containers on site, road to rail head, port or CTP

1.10 Production and Financial Summary of the Carrapateena Project and CTP

Key production and financial highlights of the Carrapateena Project and CTP include:

- Average annual production of circa 175,000 dry metric tonnes of copper concentrate pre-treatment in the CTP resulting in over an estimated 100,000 dry metric tonnes of copper concentrate post-treatment in the CTP.
- An estimated average annual production rate of 66,000 tonnes of copper and 82,000 ounces of gold over the first three years of full production and averages of an estimated 61,000 tonnes of copper and 63,000 ounces of gold per annum over the Life of Mine.
- Pre-Production Capital cost of ~A$980 million, including CTP, owner's cost and contingency.
- Projected Net Cash Flow of an estimated A$3.6 billion, including capital expenditure.
- Total revenue over Life of Mine of approximately A$10.6 billion.
- A Net Present Value at 9.5% discount rate of approximately A$770 million and an IRR of approximately 20%, both on an unlevered, post-tax basis at consensus pricing.
- A Net Present Value of approximately A$820 million and IRR of approximately 21% excluding the one off deferred consideration payment of US$50 million.
- An average C1 cash cost of production of ~US$0.50/lb copper for the first three years and ~US$0.82/lb Life of Mine, including by-product credits.

The estimated concentrate production and grade profile from the Carrapateena Project (pre-CTP) is shown in Figure 1.4.

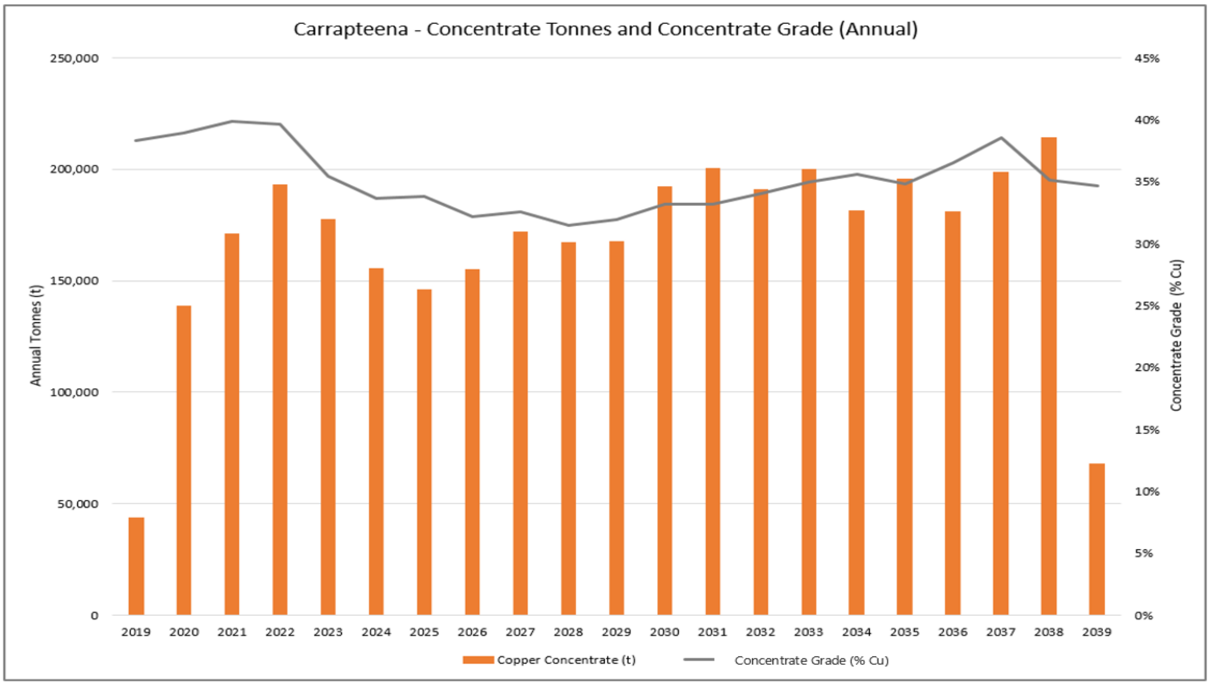

Figure 1.4: Carrapateena Project Concentrate Production and Grade Profile (pre-CTP)

1.11 Risk Management

Risk assessments were undertaken during the course of the PFS to identify threats and opportunities and develop strategies for their elimination, mitigation or realisation, as appropriate. The risk management process was conducted in accordance with the OZ Minerals Project Development Framework and Study Guidelines utilising a risk ranking matrix developed to suit the specific circumstances of the Carrapateena Project and CTP.

1.11.1 Opportunities

A number of opportunities exist to add value to the Carrapateena Project and CTP which require further study and prioritisation during the next stages of development. These are captured in the Threat and Opportunity Register and summarised below. They will be further assessed during future stages of the Carrapateena Project and CTP to determine their potential for incorporation into the final development configuration.

Mining

- Regional Mineralisation – the Carrapateena Project site location is highly prospective for additional resources, including known mineralisation at Khamsin and Fremantle Doctor. Development of the Carrapateena Project and Carrapateena Tenements will increase the likelihood of the development of these deposits.
- Within the Carrapateena resource, zones of mineralisation of reasonable grade exist which are not contiguous with the sub-level cave zone. These zones could be mined independently of the cave if economic, but require better definition through underground diamond drilling and further study.
- The Ore Reserve was defined at a cut-off grade (**COG**) of A$100/t though the break-even cut-off for sub-level caving is only A$51/t. Mineralisation of grade above break-even surrounds the sub-level cave zone (see Figure 1.5). Subject to economics and further studies, some of this mineralisation may be mined which would allow for an increase in throughput or mine life.
- The installation of a temporary crusher underground will be considered to bring forward initial production, eliminate double handling of development and production ore, and to minimise congestion in the decline. Detailed mine planning and scheduling will be conducted to confirm the feasibility of the temporary crusher.
- There remain significant opportunities to refine and rationalise the design developed during the PFS with a view to accelerating development and reducing capital costs.
- Further automation of production bogging and drilling will reduce mining operating costs and improve cave management.

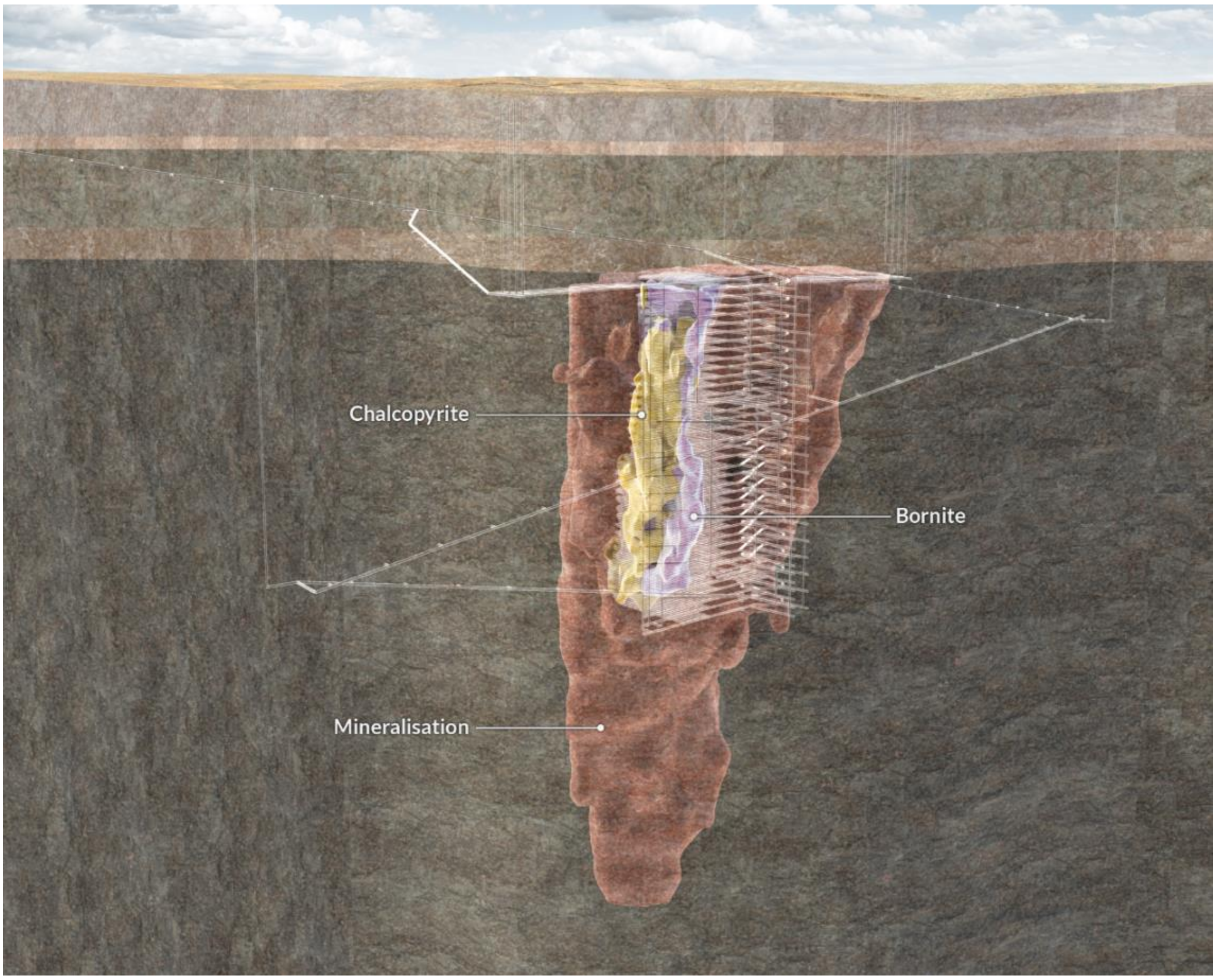

Figure 1.5: Mineralisation Surrounding Orebody

Processing

- The processing plant layout has been configured with a view to ease of future expansion but without incurring additional capital at this stage of development.
- The EPC execution strategy for the processing plant is designed to encourage innovative thinking around plant design and execution planning, which is expected to yield significant benefit to the business case and better manage execution risk.
- Rationalisation of spares and maintenance services through virtual stores and other innovations to leverage regional presence and has potential to yield further capital and operational cost benefits.
- Final test work data may deliver opportunities to further rationalise equipment sizes and allow better use of locally available bore water.

Infrastructure and Execution

- Planned water modelling and exploration activities may identify water closer to site than has been currently assumed, which would result in capital savings.
- Further opportunities to reduce initial capital requirements through Build Own Operate (**BOO**) and Build Own Operate Maintain (**BOOM**) arrangements on key packages remain to be more fully pursued.
- Opportunities for onsite incorporation of emerging technologies for renewable and hybrid power generation, and load management to reduce overall power costs and increase reliability.

Marketing

- The Carrapateena Project will produce a quality copper-gold concentrate grading of between approximately 30–40% copper using conventional crushing, grinding and flotation circuit to produce a saleable product.
- Post treatment in the proposed CTP, Carrapateena concentrate will have a copper grade of approximately 50–60% (expected to be the highest in the world) with very low impurities relative to other global concentrate. This concentrate will be attractive for smelters as:
  - the high copper content allows overall feed grade improvement
  - the stable production and political jurisdiction gives certainty of supply
  - low levels of sulphur and impurities minimise environmental impacts.
- Subject to market conditions, a Treatment Charge premium may be negotiated with the smelter. The decreased level of impurities provides potential for this concentrate to be sold to other jurisdictions, where smelters award higher metal payables due to their higher recoveries. These upsides have not been accounted for in current modelling.

1.11.2 Threats

The threats identified in relation to the Carrapateena Project were not unusual for a project of this scale, having regard to the complexity and current level of definition. The mitigation measures proposed are considered effective and deliverable.

The three highest threats associated with the Carrapateena Project are noted and discussed below. Capital cost contingency is allowed for in the estimate including A$85 million for contingent risk should these eventuate.

Highest Current Threats

The remaining high risks after application of mitigation measures are listed below.

- *Secure power supply agreement*.

  ElectraNet have completed a Connection Options Report which has confirmed system capacity to deliver mine site power requirements. It is anticipated that a Transmission Connection Agreement (**TCA**) will be signed by the parties before the middle of 2017. Work also continues with sourcing required power from the National Electricity Market in conjunction with broader OZ Minerals strategic objectives. Options for supplemented or partial onsite generation continue to be investigated as part of OZ Minerals broader energy strategy.

- *Secure water supply*.

  The Carrapateena Project configuration assumes water is sourced from a mix of bores near site and some 40 km from the site. Assumed rates of bore failures and sustainable extraction rates are based upon drilling experience and tests to date. Investigations continue in an effort to locate additional suitable water nearer to the site, and early results are encouraging. A range of water supplies are available for the site with qualities ranging from hypersaline through to saline waters. Optimisation of water quality and quantity for various parts of the operation will see effective utilisation of local resources. Water drilling continues through 2016 and an optimised wellfield location and configuration is expected to be completed in early 2017.

- *Arcoona quartzite caveability*

  Provisions have been made in the Execution Plan to engage sophisticated cave monitoring systems and undertake a pre-conditioning program well in advance of mine requirements, to add surety regarding cave propagation. A comprehensive Cave Management Plan to address this will be developed.

1.11.3 Scoping Study Comparison

The outcomes of the PFS compare favourably with the outcomes of the earlier Scoping Study, including:

- In the PFS, Life of Mine Capital and sustaining capital costs were estimated at A$1.5 billion (or ~A$20/tonne mined) compared to ~A$1.6 million (or ~$19/tonne mined) in the Scoping Study.
- Life of Mine Operating costs were estimated as ~A$3.9 billion in both the Scoping Study and the PFS.
- The PFS revenues over Life of Mine are estimated at ~A$10.6 billion compared to ~A$10.3 billion in the Scoping Study.
- The PFS mining inventory is somewhat lower than that of the Scoping Study but grades are higher.
- Capital and operating cost estimates are similar across both studies and thus economic metrics are also similar.

1.12 Market Analysis

The Carrapateena Project copper concentrate grade (before treatment at the proposed CTP) will vary between an estimated 30 – 40% and is suitable as a custom feed stock, being of similar quality to high copper concentrates available in the global market, and similar to concentrates produced by Las Bambas, Salobo, Highland Valley and Escondida. These concentrates are typically characterised as having above average copper content, low sulphur, and average gold and silver content.

OZ Minerals has significant experience in marketing copper concentrates of various grades and has strong relationships with existing and potential customers. OZ Minerals also has mature mine-to-market access via established logistics routes to customers and export ports.

After treatment in the proposed CTP, Carrapateena Project concentrate is expected to be a premium grade copper concentrate in the global market and be a desirable product for most copper smelters – being of high copper content and low impurities.

Current market research suggests that in the short term to 2018, the global copper concentrate market is forecast to be in surplus due to decreased global economic activity. However, supply is forecast to fall into deficit within the next few years. Smelter capacity is also forecast to continue to grow, albeit at a much slower rate than in the last 10 years. This gives confidence in the market outlook for demand of copper concentrate in the medium term.

The gold content in the concentrate will be in the range of 6-20 g/t and will be acceptable to most smelters. Gold and silver payable levels and refining charges are expected to be in line with industry standards.

1.13 Regional Geology and Mineralisation

The Carrapateena Project is located within the Olympic Dam copper-gold (Cu-Au) Province. This is a metallogenic belt along the eastern margin of the Gawler Craton in South Australia, which hosts the Prominent Hill mine, Olympic Dam mine and the Moonta-Wallaroo historic mining district. The craton comprises variably deformed and metamorphosed sedimentary, volcanic and plutonic rock, spread from the late Archean to Mesoproterozoic, and it has been subdivided into a series of domains – the Carrapateena deposit being part of the Olympic Domain. The age of the iron oxide copper gold (IOCG) mineralisation in the Gawler Craton is uncertain, though it is interpreted in the literature to be associated with Mesoproterozoic magmatism of the Hiltaba Suite and the Gawler Range Volcanics.

The copper-gold mineral deposit is hosted in a brecciated granite complex, with both bornite and chalcopyrite copper mineralisation present – the bornite being a distinct higher grade zone of mineralisation. The top of the deposit lies approximately 470 m below the ground surface, as illustrated in Figure 1.6.

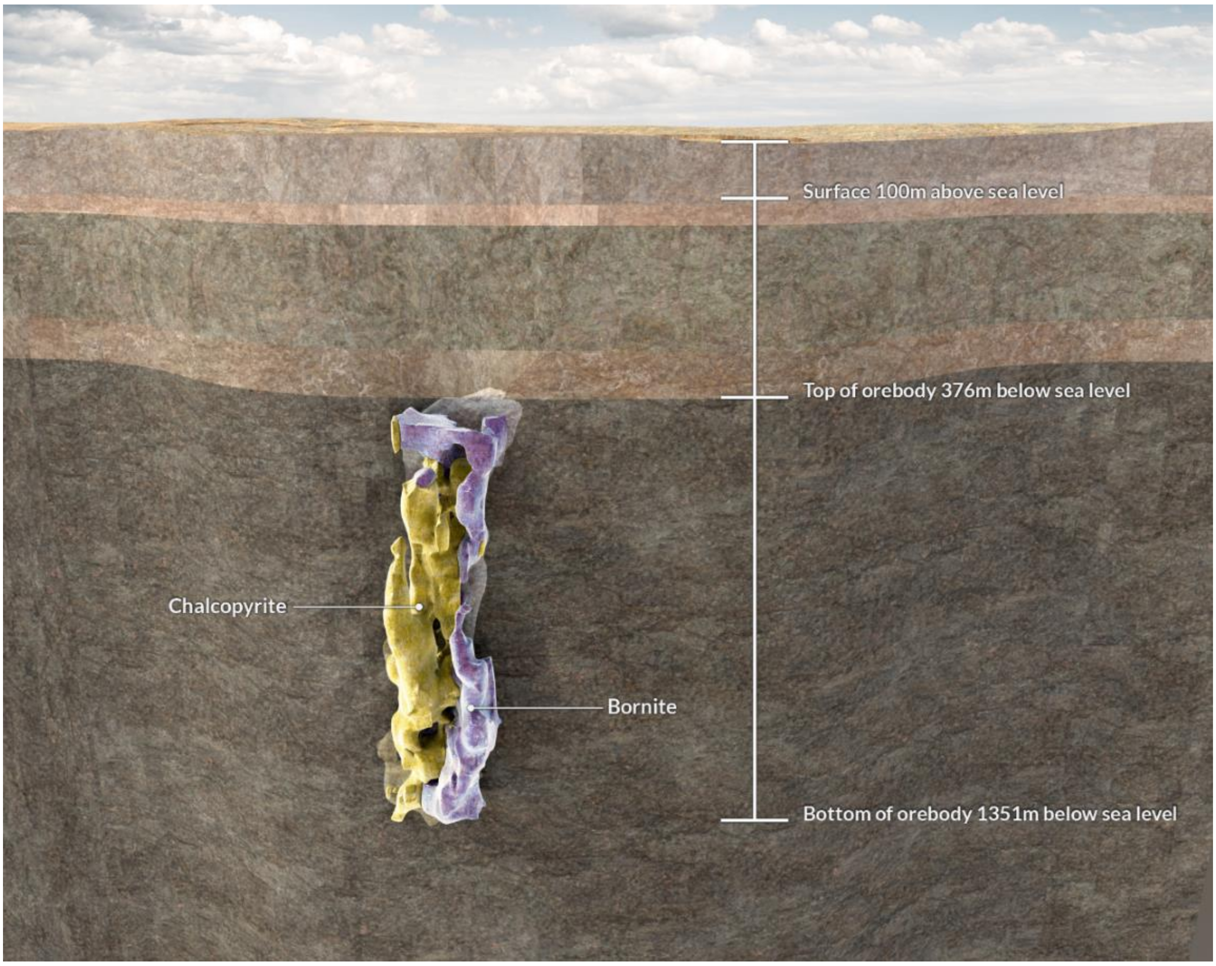

Figure 1.6: Carrapateena Project Orebody

The vast majority of copper and gold mineralisation within the deposit is hosted by hematite-dominated breccias with moderate mineralisation occurring within hematite altered granite breccias (Eastern Cu domain). Sulphides are the primary copper-bearing minerals in the Carrapateena Breccia Complex (CBC). Copper and gold mineralisation is structurally and chemically controlled, with subsequent alteration destroying mineralising structures. The most abundant sulphides are chalcopyrite, pyrite and bornite, and these constitute the majority of the sulphides at Carrapateena. The less common sulphides are chalcocite, digenite and covellite, and in smaller amounts sphalerite and galena.

Gold mineralisation at the Carrapateena Project orebody is almost exclusively hosted by hematite-altered breccias. Gold grains are usually very small (10 μm), and when seen in polished section, are often intimately associated with copper sulphides. Gold grains are commonly a combination of gold and minor silver (electrum).

1.13.1 Mineral Resource Estimate

The PFS mine design is based on the restated 2015 Mineral Resource as at 17 October 2016[1]. The restated 2015 Mineral Resource was reported as all resources within a nominal continuity shape defined at a net smelter return (NSR) cut-off of A$70/t.

The restated 2015 Mineral Resource explanatory notes can be found in the 'ASX Releases' section of the OZ Minerals website at http://www.ozminerals.com/media/asx.

A summary of the Mineral Resource underpinning the PFS is shown in Table 1.3.

Table 1.3: Restated 2015 Mineral Resource Estimate for Carrapateena Deposit

Classification	Tonnes (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Au (koz)	Ag (Moz)
Indicated	126	1.5	0.6	6.7	1,941	2,561	27.1
Inferred	7	1.0	0.5	3.3	67	99	0.7
Total	**133**	**1.5**	**0.6**	**6.5**	**2,008**	**2,660**	**27.8**

[1] "Carrapateena Project Mineral Resources Explanatory Notes as at 17 October 2016" dated 7 November 2016.

1.14 Mining and Ore Reserve

1.14.1 Ore Reserve

The Ore Reserve for the Carrapateena Project is shown in Table 1.4 and is based on the restated 2015 Mineral Resource estimate.

Table 1.4: The Carrapateena Project Ore Reserve 2016

Classification	Tonnes (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Au (koz)	Ag (Moz)
Proved	-	-	-	-	-	-	-
Probable	70	1.8	0.7	8.4	1,300	1,700	19
Total	**70**	**1.8**	**0.7**	**8.4**	**1,300**	**1,700**	**19**

The Ore Reserve for the Carrapateena Project is based on the results of the 2016 PFS and supersede those announced in 2014[2].

1.14.2 Resource Reconciliation

The Carrapateena Project resource estimate has undergone changes from the initial announcement in 2013. These changes are summarised below:

- 2013 Carrapateena Resource Statement for a Block Cave Mine
  - 760 Mt @ 0.8% Cu using a 0.3% COG
- 2015 Carrapateena Resource Statement for a Sub-Level Open Stope Mine
  - 61 Mt @ 2.4% Cu using a A$125/t Nett Smelter Return (NSR) COG
- Restated 2015 Carrapateena Resource Statement for a Sub-Level Cave Mine
  - 133 Mt @ 1.5% Cu using a A$70/t NSR COG
  - This is the basis for this PFS

This PFS is based upon the Restated 2015 Carrapateena Resource Statement for a Sub-Level Cave Mine and supports the declaration of the 2016 Carrapateena Ore Reserve.

[2] ASX Release - Ore Reserve for Carrapateena underpins low operating cost, long life operation 18 August 2014

1.14.3 Geotechnical Background

Geotechnical data were gathered in drilling campaigns undertaken by Teck Australia Pty Ltd (**Teck**) and more recently by OZ Minerals. Teck recovered 54,700 m of core from a drilling campaign dominated by vertical holes and point load tested basement rocks from five drill holes. The OZ Minerals program recovered 49,500 m of diamond core from inclined holes and cored a limited number of holes through the overburden.

Specimens from all domains, including overburden, were sent for the full suite of materials testing, including triaxial testing, joint shear strength and acoustic emission stress testing. OZ Minerals drilled three water bores above the orebody in order to test aquifers in the overburden. OZ Minerals also had 19 lines of seismic survey shot over the top of the orebody in order to better define the various horizons and major structures traversing the mine area.

The work described above was used to define the geological and geotechnical environment in which the mine is to be built. Of note is the 280 m thick Woomera Shale which is fissile, rapidly breaks down to fines and contains clay. The mineralisation itself has only two interpreted faults near it, is massive showing broadly spaced joints, has intact rock strength ranging from about 120 to 150 MPa and the block model of Rock Mass Rating (RMR) (Bienwiawski) shows typical values ranging from 70 to 80. This is equivalent to Mining Rock Mass Rating (MRMR) (Laubscher) of 63 to 72.

Two industry standard methodologies were used for assessing the caveability of the cover sequence at Carrapateena. The Laubscher methodology indicates that the cave should propagate through the overlying sequence. The Flores and Karzulovic benchmark indicates some uncertainty in propagation of the cave to surface. For comparison however, other SLC caves such as Ridgeway and Telfer, have caved greater distances than this latter benchmark indicates.

Nonetheless, in order to ensure complete cave propagation, preconditioning of the Arcoona quartzite was provided for.

1.14.4 Mining Methods

The 2016 Scoping Study concluded that an SLC operation had more favourable financial metrics and was considered a more flexible mining method to respond to changes in macro-conditions. This PFS considered SLC footprints at different COGs. The selected cave footprint delivers an optimal 4 Mtpa production rate which is within the capacity of regional infrastructure.

Additional zones of mineralisation exist outside the cave footprint which may be suitable for SLOS mining. These have not been included in the current mine plan but remain as a potential upside subject to further definition drilling from underground and subsequent mining studies.

1.14.5 Sub-Level Caving

The SLC mining method commences at the top of the orebody. Sub-levels spaced nominally at 25 m intervals are developed progressively downwards. On each sub-level, the ore is then broken by drilling and blasting a series of up-hole rings and the blasted ore is extracted. The SLC mining method is shown diagrammatically in Figure 1.7.

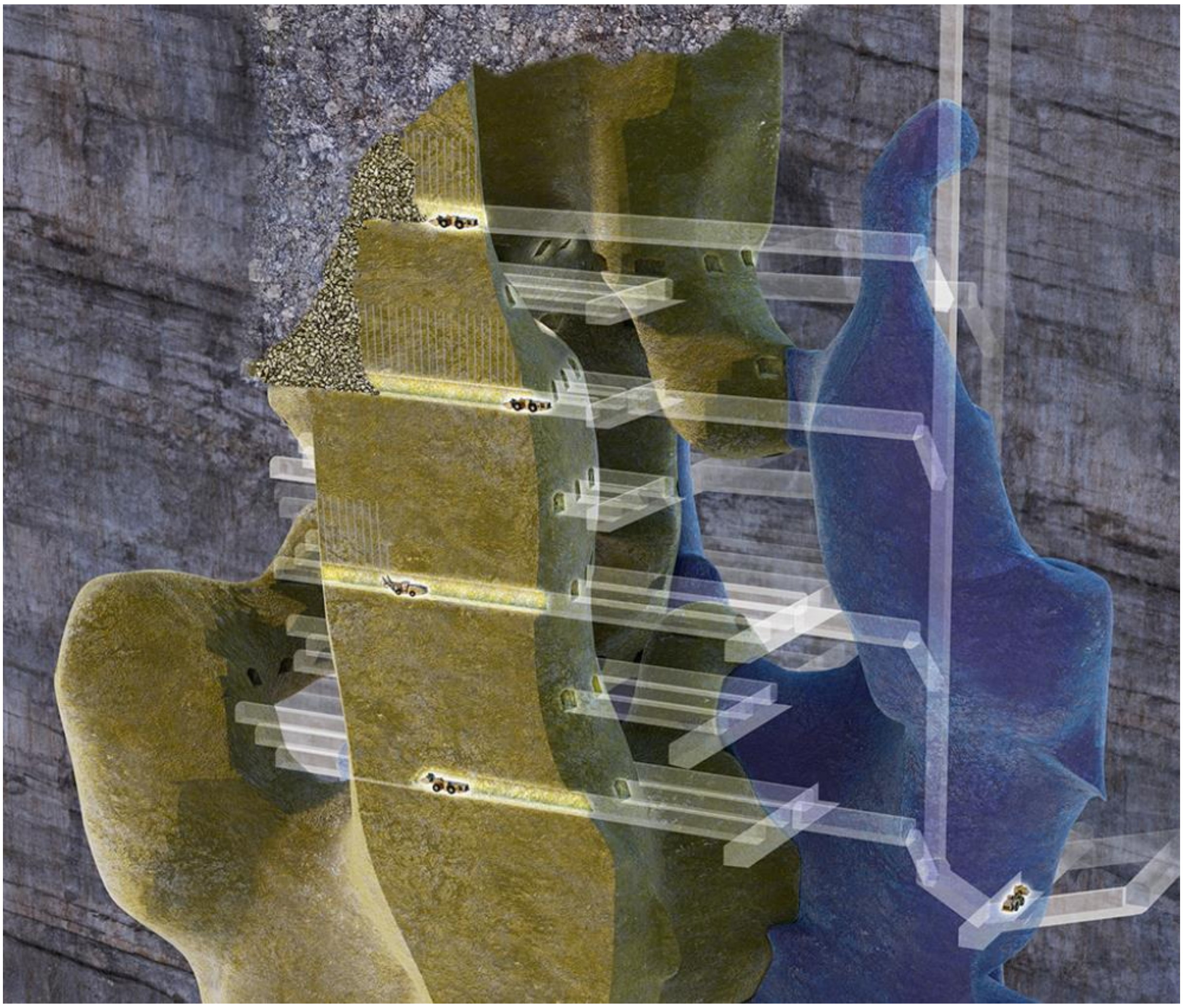

Figure 1.7: SLC Mining Method

As mining progressively extracts the orebody, the overlying cover sequence caves downwards filling the void and leaving a subsidence crater on the surface, as illustrated in Figure 1.8.

The surface expression of the subsidence crater at the end of mine life will be approximately 800 m in diameter projected upwards at 60° from the top level of the sub-level cave. Long-life infrastructure development is designed to be outside the zone of influence of this final subsidence and any future infrastructure that may be required to extract more of the lower grade mineralisation outside this scope.

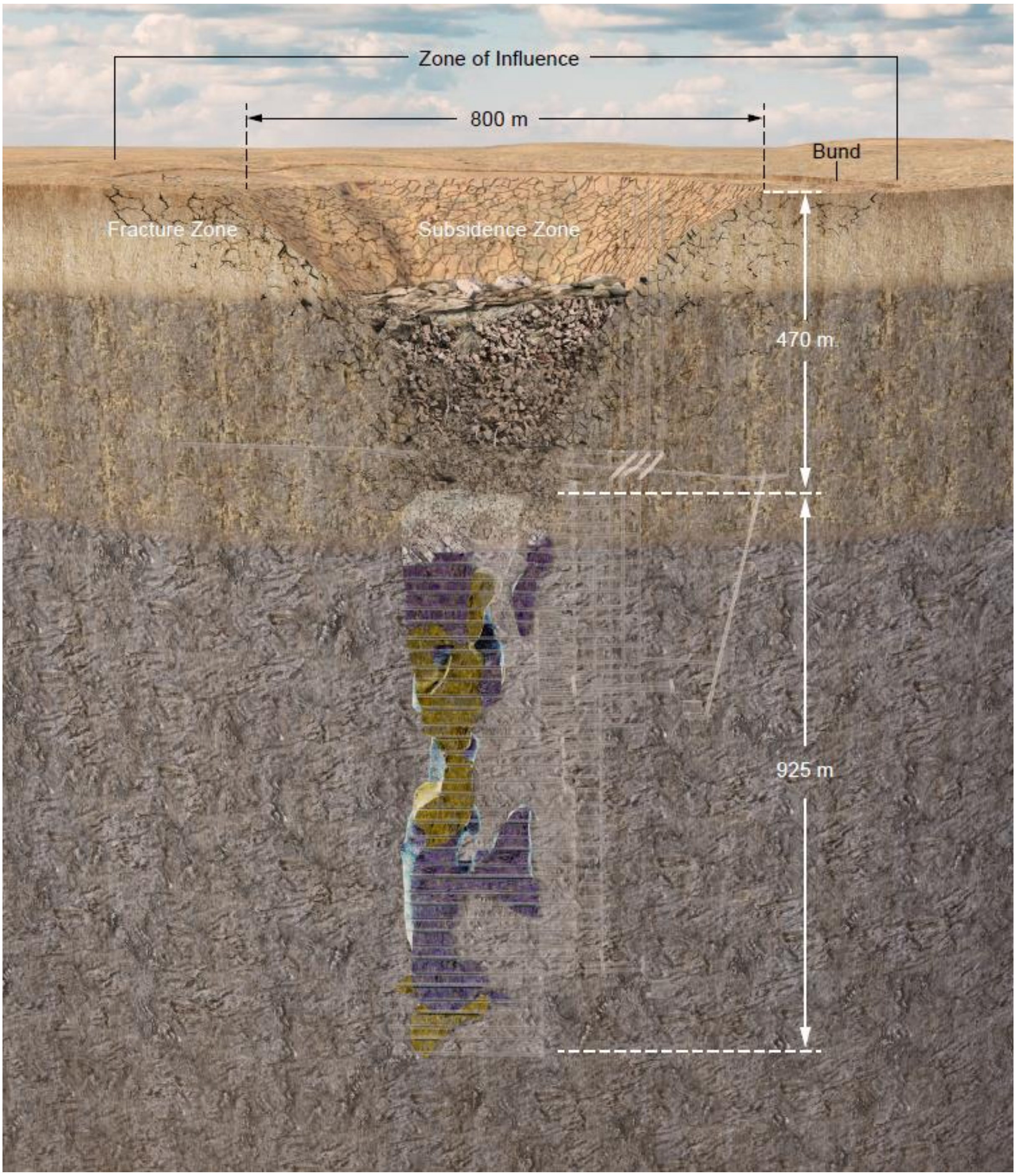

Figure 1.8: SLC Mining Method Showing Estimated Subsidence Zone

Mine Access

An access decline constructed by traditional drill and blast methods was chosen for the primary mine access to the top of the orebody because of versatility, cost and the ability to be retrofitted with a materials handling conveyor system.

The decline commences from a 20 m deep boxcut at the surface. The straight decline is developed initially to a depth of approximately 500 m, where it connects with a spiral decline on the northern side of the orebody.

The access decline extends to a depth of 700 m and has been designed to allow a conveyor to be hung from the backs in the first 3.5 km and then transition to being floor mounted (see Figure 1.9).

The design of the access decline includes four raise-bored shafts measuring 3 m in diameter along its 4.7 km length to provide ventilation during development.

In the final production configuration, six permanent ventilation shafts will be raise-bored to 5.0 m in diameter, with one shaft configured as an emergency egress shaft – these will be developed as needed during mine development.

All mine infrastructure has been placed outside the resource and cave influence to allow possible future expansion.

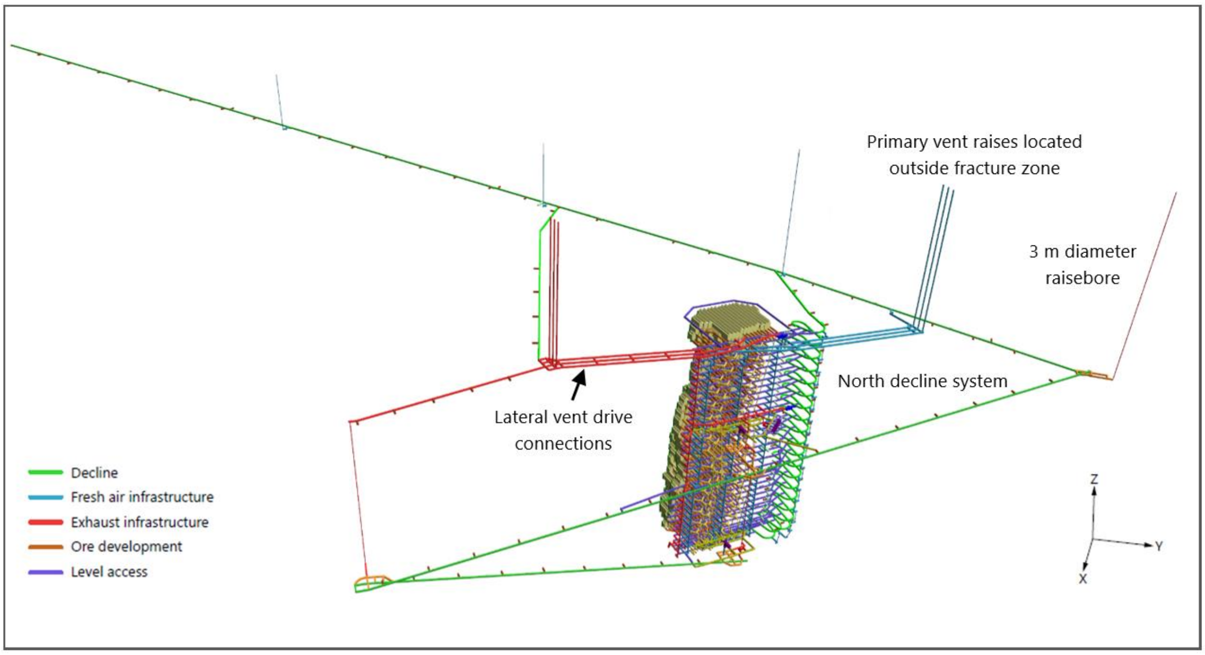

Figure 1.9: SLC Mine Layout (looking north-west)

Sub-Level Cave Design

An NSR COG of A$100/t was required to generate an economic caving footprint sufficient to sustain a 4.0 Mtpa operation.

The top production level is at the 4560 mRL. The level spacing is 25 m, consistent with current Australian sub-level caving operations. Level spacing will be reviewed and optimised on draw characteristics as the mine is developed. The sub-levels comprise 6 m wide extraction drives on a centre spacing of 15 m and the levels are typically about 170 m wide x 240 m long, as shown in Figure 1.10.

Only a portion of the available ore will be drawn from the upper three production levels. As caving progresses below these levels, the ore left behind (blasted ore blanket) will inhibit the entry of dilution from the caved overburden. Horizontal orebody step-outs are limited to one drill drive. Where wider step-outs were required, the cave draw strategy of the uppermost levels was used for the area of the step-out.

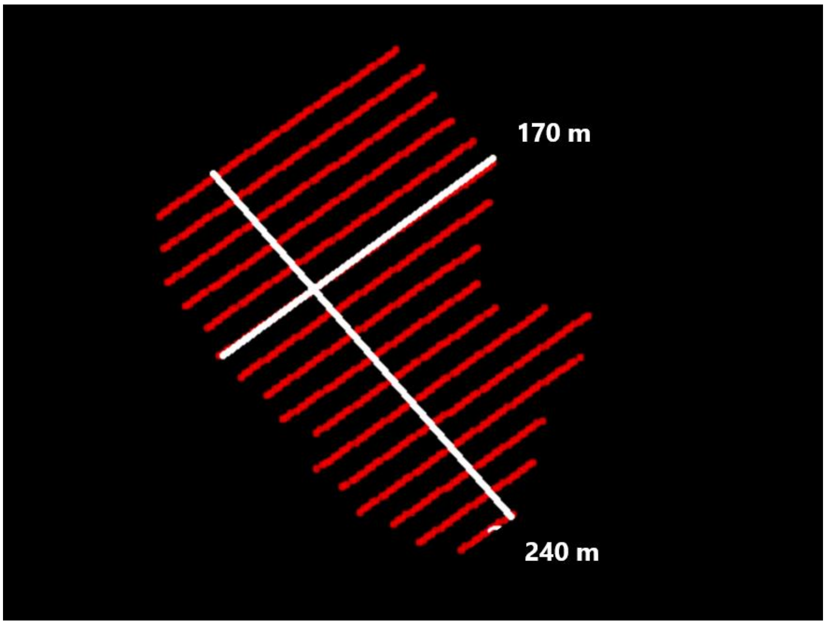

Figure 1.10: SLC Mine Footprint Dimensions (for hydraulic radius of 44 m)

Table 1.5: Design Parameters of Various Sub-Level Caving Mines

Mine	Drill Drive Spacing (m)	Sub-Level Spacing (m)	Drill Drive Width (m)
Carrapateena (Design)	15	25	6
Ernest Henry	15	25	6
Mt Lyell	15	25	4.5
Perseverance	14.5	25	5.5
Ridgeway	14	25-30	6
Telfer	14	25	6
Stobie	17.5	30	6
Malmberget	22.5	27.5	6.5
Kiruna	24.75	27.5	7

Production scheduling has been based on a maximum of 400 tonnes per day per drawpoint and level lag of 45 degrees, with typically up to four levels open to production.

Upon commencement of the fourth production level (approximately 12 months from commencement of production), it is expected that the cave will have reached the surface. Once this occurs there is no longer an air gap between the caved material and the material yet to cave. Thus the danger of an air blast through the instantaneous caving of the material yet to cave is eliminated and cave extraction can progress more readily.

Draw Control

The draw control methodology used in the PFS was based on simulation modelling where the draw from each ring was optimised based on the shutoff grade as shown in Figure 1.11. This varies from the pre-set levels of draw across entire levels, as used during the Scoping Study. This yields an optimised draw strategy for each individual ring and results in a lower tonnes draw factor with comparable metal recovery factors, and consequent higher grades as shown in Figure 1.12.

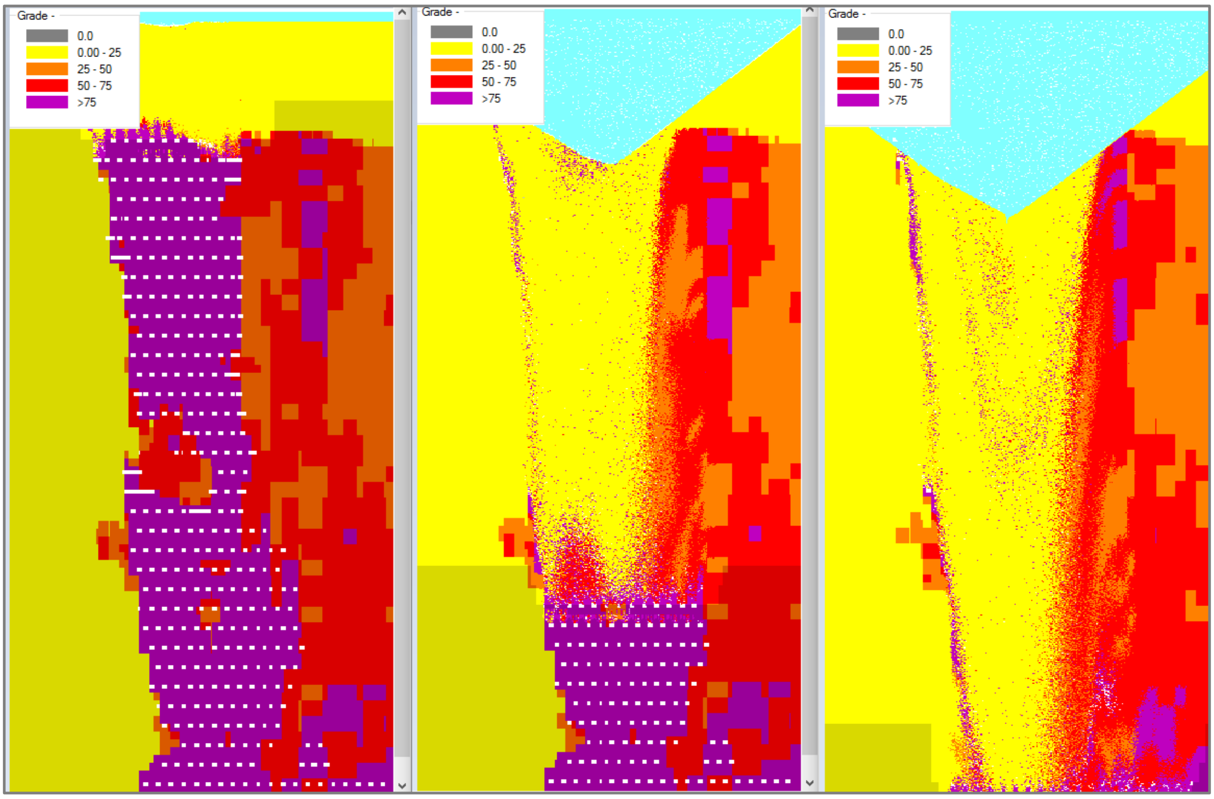

Figure 1.11: Carrapateena Draw Model

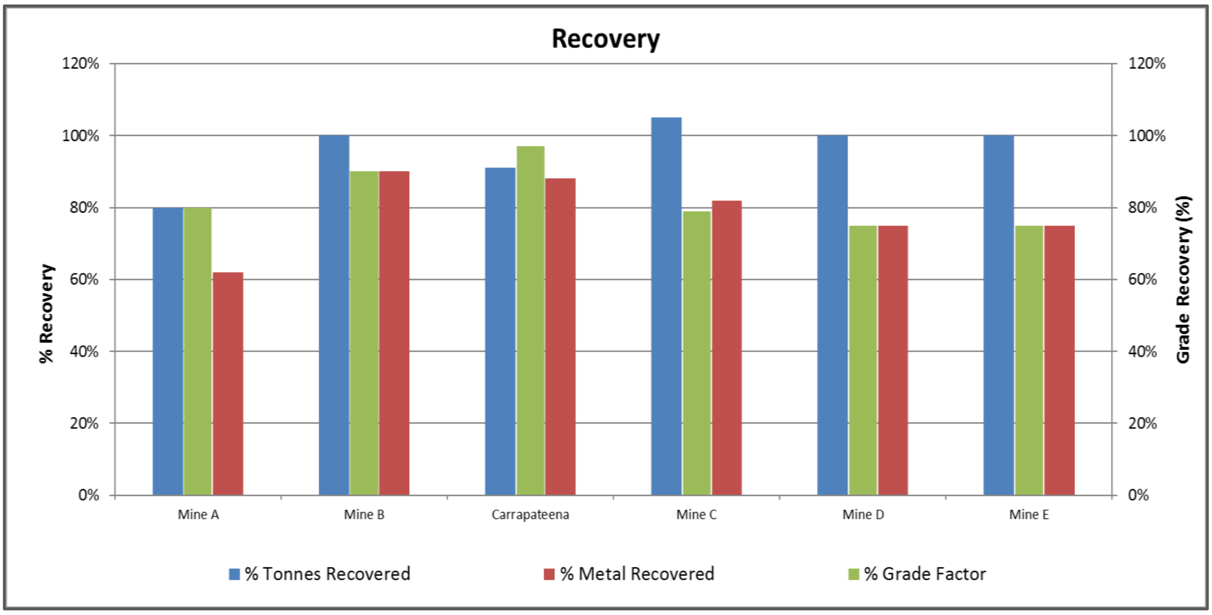

Figure 1.12: SLC Recovery

Sub-Level Cave Dilution

Dilution is defined as material originating outside the mining footprint. During the PFS the flow of the broken rock was simulated and it was found that much of the material from outside the mining footprint carried grade. In the Scoping Study, this material was assumed to be unmineralised and the average grade was underestimated. Hence the PFS ore grades are higher than those of the Scoping Study.

Material with no metal content emanating from above the mining footprint is largely eliminated due to the blasted ore blanket.

Sensitivity modelling tested the impact of the ingress of fines dilution from the Woomera shale assuming it migrated more quickly through the blasted ore. The results are summarised in Table 1.6 and indicate that if the shale travelled faster than the other overlying rock, dilution would drop the ore value marginally. Additional information regarding dilution and draw control modelling are appended to the main body of this report.

Table 1.6: Grade Impact of Relative Probability of Shale Movement

Relative Probability of Movement of Shale	Ore Grade (NSR A$/t)	% Reduction in Grade
Standard Probability	112	-
2 x Standard Probability	110	-1.8%
3 x Standard Probability	106	-5.3%

The use of the modelled draw strategy mitigates against the dilution ingress, as demonstrated in Figure 1.13 where the Whyalla sandstone and Woomera shale remain above each new blasted sub level even when the assumed rate of migration increases from 1 to 3 times that of the mineralisation.

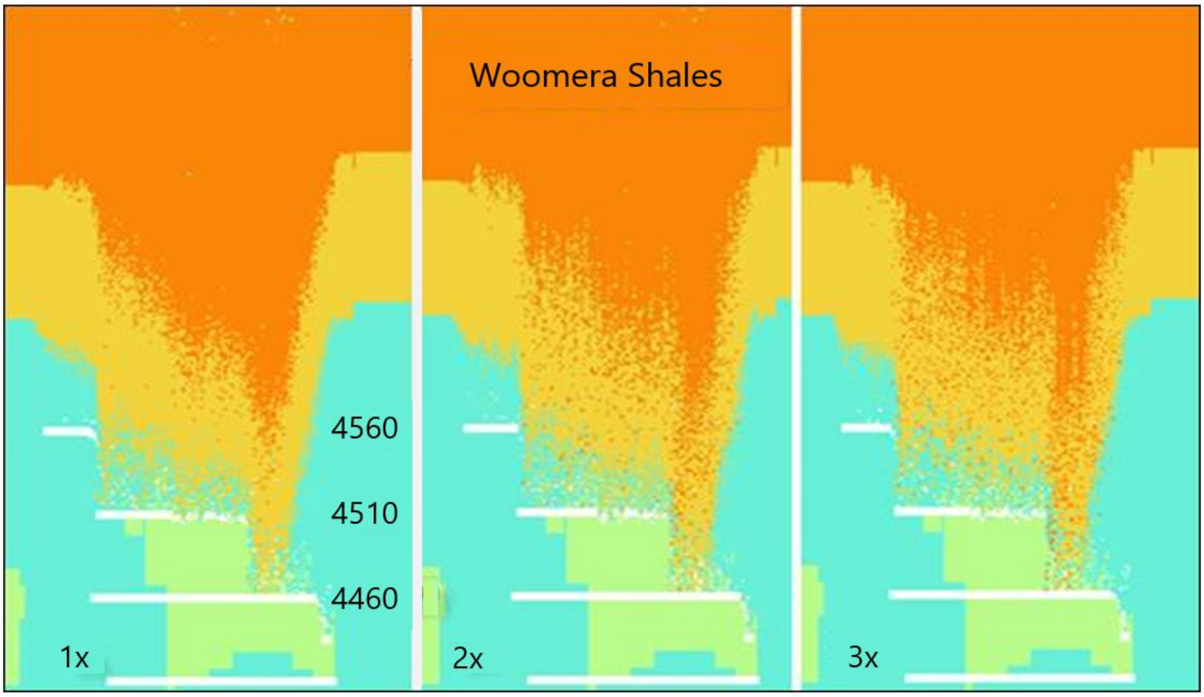

Figure 1.13: Dilution Sensitivity Model (Woomera shale shown in orange)

Materials Handling

During the construction of the decline conveyor and underground crushing system, development ore and waste and initial production ore will be trucked to surface. Stockpiled development and production ore will be crushed through a mobile crusher before deposition on the coarse ore stockpile (**COS**).

After the installation of the decline conveyor and crusher systems, ore will be collected by Load Haul Dump (LHD) loaders and delivered directly to ore passes located on each sub-level. The ore passes will be 3 m in diameter and fitted with a sizing system at each level. At the base of the ore passes, LHD loaders will transfer the ore into the crusher. Infrastructure necessary to allow remote and autonomous operation of the LHDs in the draw points and feeding the crushers has been included in the design basis to improve overall efficiency. This will allow an operator located in the surface control room to operate multiple mining fleet assets without being exposed to any harmful conditions.

The upper gyratory crusher will be located at approximately the 4285 mRL. The crusher is designed to produce material with a P_{80} of 130 mm. Crushed ore will be transported to the COS by conveyor prior to processing. The underground conveyor system includes facilities for tramp metal removal to protect the conveyor belt from damage.

As the mine is deepened, a second crusher will be installed at the 3810 mRL and the conveyor system will be extended.

Waste rock generated during mine development will be trucked to the surface for use as a construction material or stockpiled on the waste rock stockpile.

Mineable Inventory

The mineable inventory is shown in Table 1.7 and is made up of 91% Probable Ore and 9% Inferred Mineral Resource. The modifying factors used in the estimation of the Ore Reserve were also applied to the Inferred Mineral Resource in the Mineable Inventory. The design of the SLC envelope which contains this inventory was based on an NSR cut-off of A$100/t.

Table 1.7: Carrapateena Project Mineable Inventory

Classification	Tonnes (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Au (koz)	Ag (Moz)
Probable	70	1.8	0.7	8.4	1,300	1,700	19
Inferred	6	1.8	0.7	5.2	100	100	1
Total	**76**	**1.8**	**0.7**	**8.2**	**1,400**	**1,800**	**20**

Carrapateena Project Production Schedule

The mine production schedule developed during the PFS shows a ramp up of three years, reaching full production in 2021, as shown in Figure 1.14.

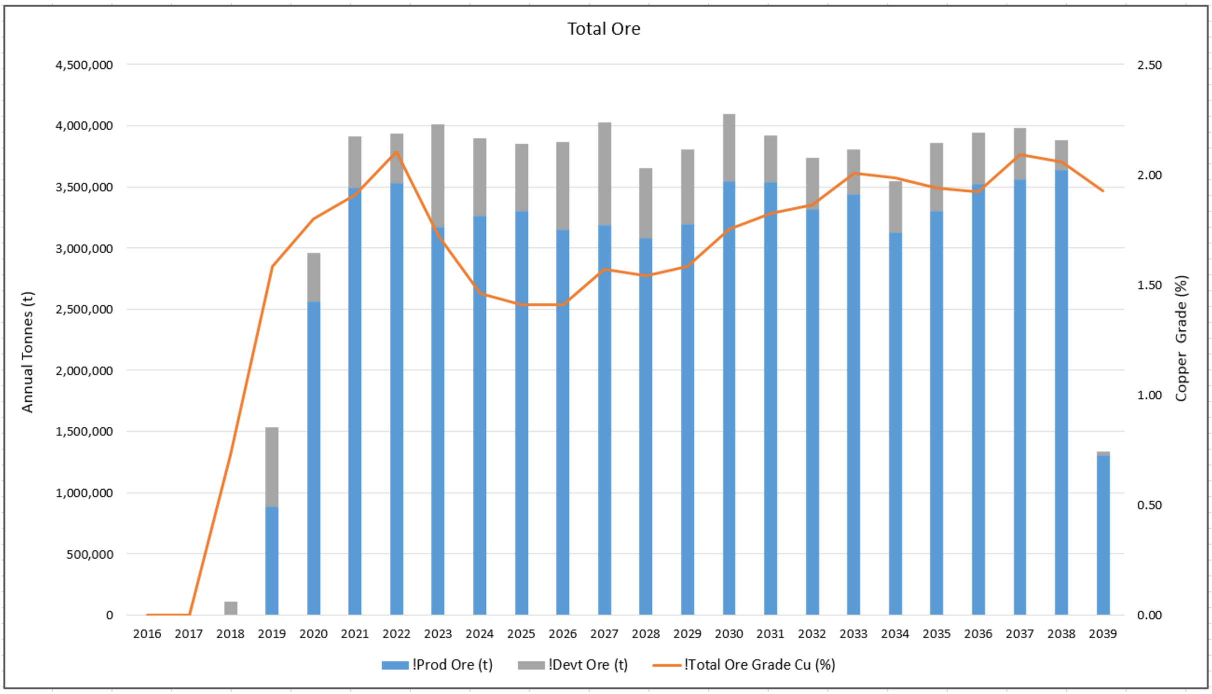

Figure 1.14: SLC Mine Production Schedule

Manpower

Mining manpower peaks when development rates are at full capacity. Following the installation of the underground conveyor system, the manpower reduces to sustained levels. The study assumes contracted services to support development of the decline and operation of production mining. Transition to owner mining and assessment of the benefits over the contractor case will be further assessed during the next stages of development.

Ventilation

Ventilation requirements peak at around 800 m^3/second when the mine is in full production. Primary fans located on the intake raise-bored shafts at the surface will downcast fresh air into the mine to keep the mine under positive pressure. Each production level will include intake ventilation and exhaust ventilation raises. Secondary fans will distribute fresh air to all development headings and production drill drives, removing radon, dust and other emissions.

A cooling plant capable of delivering 21 MW(R) of cooling power is provided for when production is below a depth of 930 m (approximately 2026) due to the likely ambient rock temperatures.

Mine Dewatering

A groundwater model has been developed to inform water management decisions. The mine dewatering system will be designed to pump both steady state inflows (mine operating water and groundwater inflows), and any transient inflows as a result of rainfall into the surface cave footprint.

Dirty water pump stations will be located in vertical alignment through the mine, each capable of pumping the expected water up to 400 m. Each pump station will consist of a trommel screening area (to remove tram material and coarse solids), storage dam and pumps. The uppermost pump station will pump to the surface at VR2 via one of two rising mains. On the surface, the rising mains will be connected to both the mine and process plant surface settling ponds so that the water can be re-used.

Underground Infrastructure

To provide support for underground operations, the mine services infrastructure will feature a robust communications system comprised of fixed redundant path fibre-optics, wireless data network and digital radio to support a new generation of mining technology. The underground infrastructure will also include all necessary power distribution, water reticulation, drainage, compressed and respirable air supply as well as exhaust and contaminated air management.

Underground workforce requirements and maintenance facilities have been provided, including emergency egress and refuge facilities.

1.15 Mineral Processing

1.15.1 Test Work

An extensive metallurgical test work program has been undertaken on each of the ore types to be treated through the processing plant. A total of 46 samples have been collected and tested to determine the grinding, flotation and materials handling characteristics of each ore type. The results from this work have been used to populate the ore block model to align the performance of the processing plant with the modelled mine plant.

1.15.2 Process Plant Ore Supply

The minerals processing plant is designed to treat 4 Mtpa of crushed ore sized at an F_{80} of 130 mm to suit conveying and grinding equipment from the underground mine, to produce a copper-gold flotation concentrate. Prior to installation and commissioning of underground crushing facilities, Run of Mine ore will be trucked to the surface and temporarily stockpiled prior to crushing and deposition on the COS. This temporary surface ore stockpile is expected to reach a maximum size of 1 Mt. In final configuration, a decline conveyor will deliver crushed ore directly to the COS.

The mineralogy of the ore mined over the life of the Project is shown in Figure 1.15. The mineralogy is predominantly chalcopyrite and bornite, with minor amounts of chalcopyrite-pyrite and dilution materials. The proportion of chalcopyrite reaches a maximum of approximately 90% of treated ore produced in 2028.

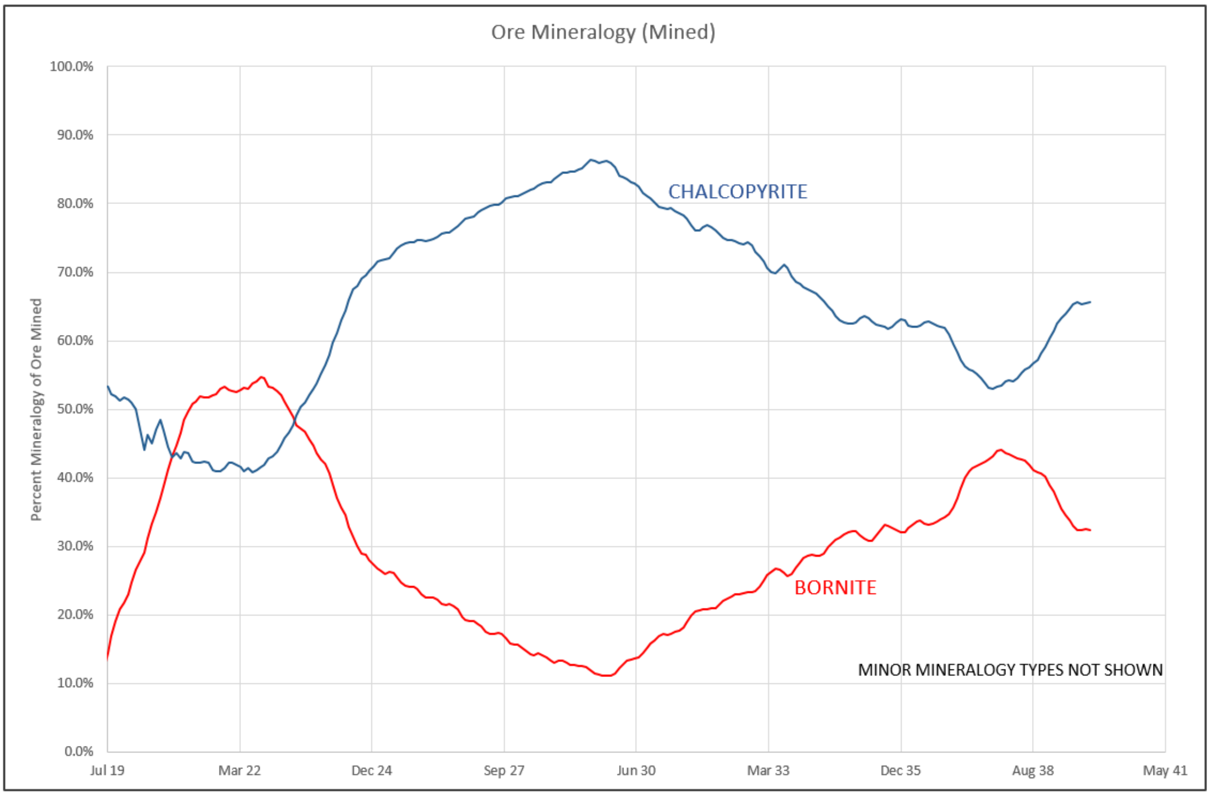

Figure 1.15: Ore Mineralogy

1.15.3 Process Flowsheet

The minerals processing plant will include the following processing stages:

- Conveying, stockpiling and reclaiming of crushed underground ore
- Grinding in an SABC (SAG Mill, Ball Mill and Pebble Crusher) in closed circuit with cyclones producing a grind size P_{80} of 75 µm
- Recovery in a flotation and regrind circuit
- Thickening and filtering of the concentrate
- Stockpiling of the filtered concentrate in the concentrate storage shed prior to placement in containers for storage and load-out
- Thickening of tailings in a Hi-rate thickener and pumping to the tailings storage facility (**TSF**).

A simplified flowsheet is shown in Figure 1.16.

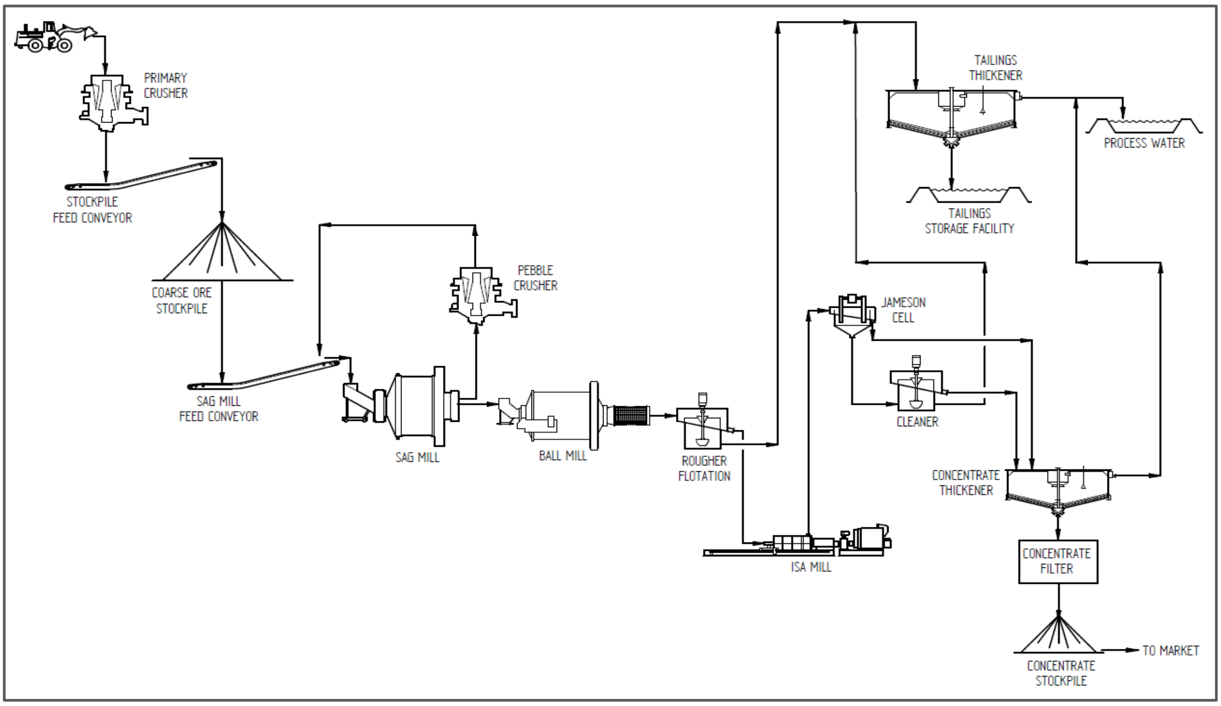

Figure 1.16: Simplified Processing Flowsheet

The Process Design Criteria are listed in Table 1.8.

Table 1.8: Process Design Criteria

Item	Unit	Design Value
Annual mill throughput	Mtpa	4.00
Average mill throughput	tph	500
Concentrate operating hours	h	8,000
Copper feed grade – design	%	2.50
Copper feed grade – LOM	%	1.78
Gold feed grade – LOM	g/t	0.71
Concentrate design grade[1]	% Cu	35.0
Concentrate design range[1]	% Cu	31.2 – 40.5
Copper LOM recovery[1]	%	91.3
Gold LOM recovery[1]	%	73.0
Axb		35.63
Rod mill work index	kWh/t	19.2
Ball mill work index	kWh/t	18.0
Crushing circuit	location	Underground
Process Feed Size	F_{80} F_{100}	130 320
[1] Flotation concentrate grade prior to potential CTP upgrade		

1.15.4 Facility Description

Underground crushed ore will be transferred onto the stockpile feed conveyor and discharged onto the COS, from where it will be reclaimed via underground feeders to the minerals processing plant grinding circuit.

The minerals processing flowsheet has been developed following trade-off studies to determine the most efficient design. The grinding circuit will consist of a SAG mill with crushing and recycling of SAG mill pebbles, and a ball mill operating in closed circuit with cyclones to produce a product with a P_{80} of 75 µm – which test work shows is the optimum balance of grinding power and recovery.

The selected SAG mill is a shell-mounted grate discharge mill with a 9.75 m diameter (inside shell) and an effective grinding length of 4.42 m. The mill will be designed for a nominal ball load of 12%, operating at approximately 60-80% of critical speed.

The ball mill will be a shell mounted overflow-type ball mill with a 6.71 m diameter (inside shell) and an effective grinding length of 12.19 m. The mill will operate with a ball charge of 28% by volume.

Mill sizes have been selected to be able to treat 4 Mtpa of ore with of a 75th percentile hardness and motor sizes have been selected to optimise spares and parts handling.

SAG mill discharge screen oversize will be directed via chutes, conveyors and feeders to the 315 kW pebble crusher where efficient crushing of pebbles will occur that would otherwise consume mill power.

Recovery of the copper and gold into the flotation concentrate will be achieved through rougher flotation, then rougher concentrate regrinding to 20 µm followed by three stages of cleaning. The cleaner flowsheet has been selected to maximise recovery whilst ensuring effective removal of uranium and fluorine from concentrate at a reasonable cost. Reagents will be introduced at strategic locations and the main flotation streams will be analysed by the on-stream analyser. The final concentrate mass recovery, grade and metal recovery will vary depending on the dominant copper mineral in the feed.

Final concentrate will be pumped to the concentrate thickener for dewatering prior to transfer into the filter feed tank. Concentrate will be filtered in a pressure filter and washed prior to storage in the concentrate storage shed. A front end loader and the semi-automated container handling system will be used to load the concentrate into containers prior to transfer from site by road trains.

Tailings will be treated to maximise effective recovery of process water. Flotation tailings will report to the tailings thickener for dewatering and a thickened tailings slurry underflow will be produced. Iron calcium precipitate (ICP) returned from the CTP will be combined with the thickened tailings and transferred to the tailings storage facility (TSF). A decant system at the TSF will recover water remaining in the tailings slurry and pump the water back to the process water storage pond, where it will be reused in the processing operation.

The key mechanical parameters for the processing equipment are summarised in Table 1.9.

Table 1.9: Key Mechanical Equipment

Item	Unit	Design Value
Primary mill	type	Grate discharge SAG mill
Mill dimensions	m x m	9.75 x 4.42
Installed mill power	MW	8.5
Secondary mill	type	Overflow ball mill
Mill dimensions	m x m	6.71 x 12.19
Installed mill power	kW	10,500
Pebble Crusher	type	Short head cone crusher
Installed Pebble Crusher power	kW	315
Grinding circuit product size	µm	75
Rougher flotation	29 minutes	5 x 130 m^3 cells
Regrind mill type	type	1 x ISAMill
Installed regrind mill power - total	kW	3,000
Pre-cleaning	type	Jameson Cell
1st Cleaners	29 minutes	6 x 40 m^3 cells
2nd Cleaners	37 minutes	5 x 20 m^3 cells
3rd Cleaners	41 minutes	4 x 20 m^3 cells
Concentrate dewatering	type	Hi-rate
Concentrate thickener diameter	m	15
Tailings dewatering	type	Hi-rate
Tailings thickener diameter	m	27
Feed to concentrate filter	t/h	32
Concentrate filter	type	Pressure filter

1.15.5 Tailings Storage Facility Description

A TSF will be constructed in stages as a cross-valley embankment at the head of the Eliza Creek approximately 11 km upstream of Lake Torrens. It will have an ultimate design storage capacity of 110 Mt with a long term in situ bulk density of 2.0 t/m^3.

The TSF valley floor consists of a 5 m thick layer of gravel and cobble sized rock fragments on valley slopes between 2% and 10%. Arcoona quartzite approximately 90 m thick underlies the TSF floor colluvium. Groundwater exists in the 30 m thick Corraberra Sandstone geological units which sit under the Arcoona quartzite and above a 270 m thick layer of Woomera Shale.

The TSF will initially be constructed with sufficient capacity to accommodate over three years' planned production and a design crest width of 6 m and nominal embankment height of 20 m (including 3 m freeboard). The TSF will be expanded by way of a series of raises from the initial embankment to arrive at an ultimate crest width of 8 m and nominal embankment height of 46 m (including freeboard).

The TSF will be designed, constructed and operated in accordance with the ANCOLD guidelines which take in to consideration siting, initial embankment construction, subsequent raises and rate of rise, water management, erosion control and inspection and maintenance requirements.

Materials of construction for the initial embankment would comprise of compacted silty/clayey gravel, Non Acid Forming (**NAF**) mine waste rock and colluvium collected from within the TSF impoundment area. The first TSF embankment raise will be constructed in a downstream direction using similar material whilst subsequent raises will be constructed upstream using compacted tailings and durable rock armour.

Seepage cut-off trenches will be excavated within the embankment footprint down to the quartzite bedrock, with the remaining embankment footprint scarified, moisture conditioned and compacted to achieve a competent foundation for the embankment.

Tailings will enter the TSF by way of sub-aerial spigot discharge points either at the head of the valley reaches, from the upstream crest of the TSF embankment or from the valley sides. This optionality allows the beach slopes to be created in such a way as to optimally position the supernatant decant pond. This will provide ease of decant water recovery to a decant staging pond prior to re-use on the minerals processing plant. Beach slopes are expected to be nominally 1V:50H.

Supernatant water would be removed from the TSF via a gravity outfall pipe, equipped with several decant inlets. Tailings will be spigotted from the perimeter of the TSF so that supernatant water collects near at least one of the decant inlets. Initially the pond would be located adjacent to the initial TSF embankment, with progressive deposition during Year 2 and Year 3, directing the pond away from the embankment. Temporary decants will be provided during the early stages of TSF formation until the pond is established at its final location. Development of the pond in this manner allows the initial TSF embankment to be reduced in size, correspondingly reducing the amount of construction material required.

Each decant structure would consist of a rock filter surrounding a 1.8 m diameter slotted reinforced tower. Water will flow via gravity through the rock filter and tower into a decant riser pipe consisting of slotted or drilled 250 mm diameter PVC pipe that is connected to a buried HDPE decant pipeline. Captured water will flow via gravity through this decant pipeline, under the TSF embankment and to a decant staging pond for recovery to the processing plant. As the decant pond moves away from the embankment during the initial years of operation, temporary decant structures would be plugged with concrete and capped to prevent tailings ingress.

Design parameters for the TSF are summarised in Table 1.10.

Table 1.10: Tailings Storage Facility Design Parameters

Item	**Comment/Details.**
General	
Total Tailings Volume	55.3 Mm^3
Tailings Supply Rate	4.0-4.75 Mtpa
Solids Concentration	65% w/w
Tailings Deposition Life	26 years
Design Summary	
Impoundment Type	Cross valley embankment
Rate of Rise	2 m/yr, down to 0.5 m/yr
Beach Slope	0.7%
Consequence Category	"Significant" (ANCOLD 2012 Guideline)
Final Beach Surface Area	440 Ha
Catchment Area	1500 Ha (including the decant dam)
Embankment Construction	
Stage 1	20 m high, 1.1 km long, constructed of waste rock
Stage 2	8 m downstream lift, 1.4 km long, predominantly constructed on waste rock
Stage 3-5	7, 4 and 3 m upstream lifts, 1.7, 1.9, 2.0 km long, tailings as fill material (with rock armouring)

The location of the TSF in relation to Tjungu Accommodation Village, the processing plant and the mine, is shown in Figure 1.17. It should be noted that the TSF is located in an adjacent valley to all surface infrastructure to minimise overflow risk.

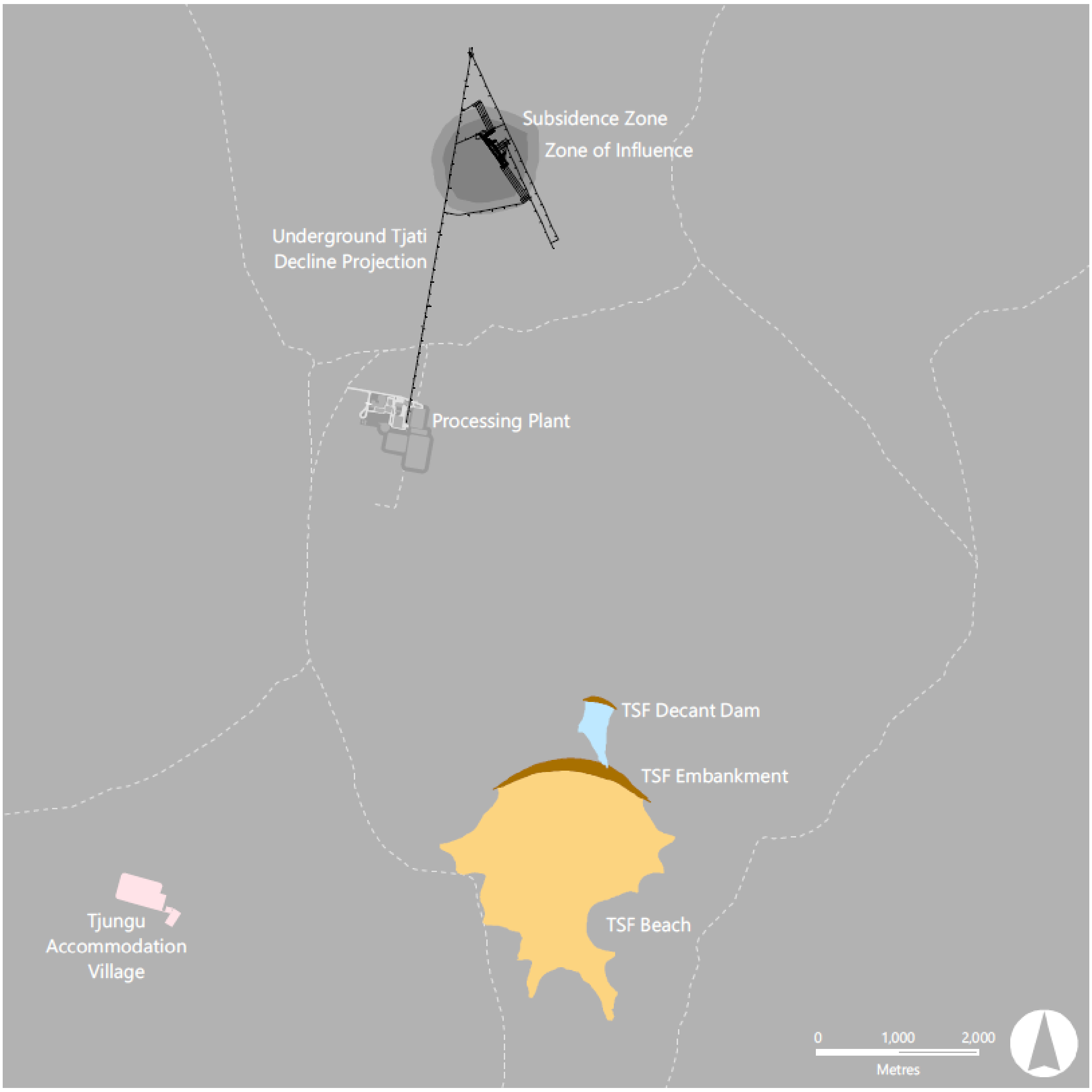

Figure 1.17: Location of Tailings Storage Facility

1.15.6 Concentrate Treatment Plant

The concentrate produced by the Carrapateena Project will be marketable in its own right but is intended to be improved through treatment in the proposed CTP. The investment and design case for the CTP is the subject of a separate Feasibility Assessment and report. The CTP is proposed to be located in the Upper Spencer Gulf region with a number of site options currently being assessed. Additional pilot scale testing is in progress and early results confirm the copper concentration upgrade and deleterious material rejection seen in prior tests. A Front End Engineering and Design (**FEED**) scope is underway with updated capital and operating costs expected in November 2016. Orders have been placed for the long lead autoclaves that form the heart of the hydrometallurgical process in order to expedite completion of the CTP.

1.16 Infrastructure and Services

1.16.1 Site Water Supply

Previous studies and test drilling have identified an area approximately 40 km to the northwest of the site within which the Project wellfield (wellfield) will be established. The number of required production wells has been established based upon the maximum instantaneous flow required from the wellfield, which results when the process plant is operating at full capacity and there is no return water from either the mine or the TSF. As these conditions relax, wellfield draw will be reduced.

A standard local diesel generation power supply system is included for the purposes of the PFS cost estimate. This will be reviewed and optimised during the course of the Feasibility Study.

On-site water demand will consist of raw water (process), reverse osmosis (RO) permeate, potable water and brine, with the RO treatment plant producing approximately 0.5 ML/day.

1.16.2 Site Power Supply

During the course of the PFS, discussions were conducted with ElectraNet and a Connection Options Report was developed. This report confirmed that the estimated 55 MW required for site operations is available at the connection into the 132 kV substation at Mount Gunson. High voltage transmission line ownership is not a core strategic imperative for OZ Minerals and this PFS assumes a Build, Own, Operate and Maintain model for this asset. In addition, the Project includes installation of 8 MW of diesel-powered emergency backup power supply. Normal operational site power will be supplied via a new 55 km long 132 kV transmission line in the corridor, shown in Figure 1.18, to a substation located near the processing facility.

The 132 kV supply will step down to 22 kV and be further reticulated to other users such as mining, surface operations facilities and accommodation facilities via overhead transmission lines.

1.16.3 Road Access

Access to the site is currently via a turn-off located on the Stuart Highway some 75 km from Port Augusta. This site access road is a graded unsealed road, running approximately 90 km from the Stuart Highway turn off to the location of the development site. A new site access road is proposed traversing approximately 50 km directly west from the Project site to the Stuart Highway, as shown in Figure 1.18.

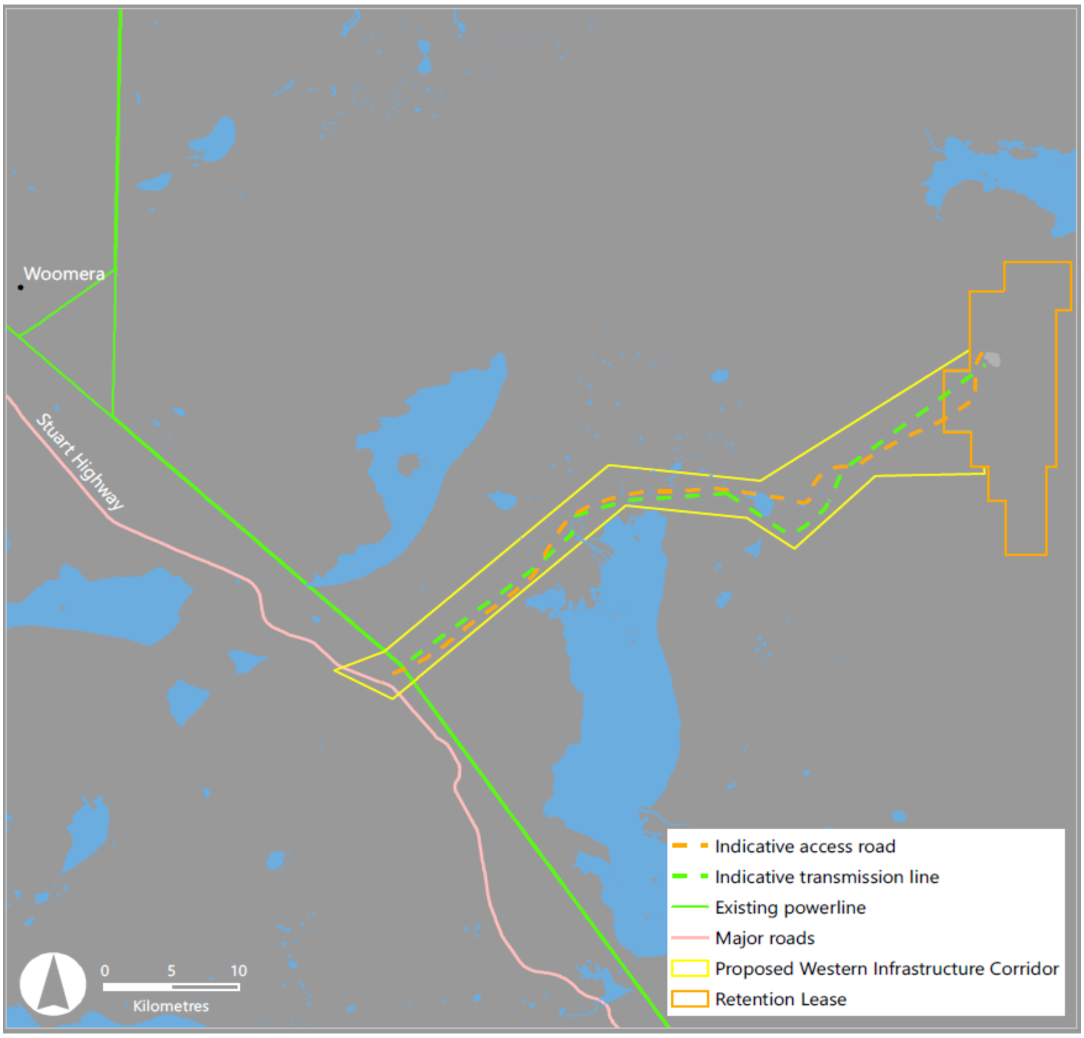

Figure 1.18: Infrastructure Corridor

1.16.4 Tjungu Accommodation Village

The accommodation village services will be designed to accommodate the expected peak number of operational personnel. The village will consist of permanent, ensuited rooms, with further leased rooms for the construction peak period. The permanent rooms will utilise the 176 existing exploration rooms and 88 surplus rooms from the Prominent Hill operation. The remaining permanent rooms will be sourced from the market. It is anticipated that site operational staff will number approximately 450 including support teams and services.

The village will be designed for a 25-year life span and will be in compliance with building classification Class 1b of the National Construction Code (**NCC**), and be supported by necessary infrastructure and services. There remains the option to contract out the construction and operation of the village on a BOOM basis and this will be further reviewed during the Feasibility Study.

1.16.5 Operations, Administration, Workshops and Maintenance Facilities

There will be a centrally located facility in the proximity of the Process Plant, Mine Access and Services areas that will house the infrastructure required to support operations. The central facilities will be designed to support our vision of the next generation of mines and to promote collaboration across business functions. The layout will be designed to consider work flows and the movement of personnel as they go about their tasks, as shown in Figure 1.19. Operational data and summaries will be made available where they are needed to support operational decision making.

The site operational facilities will include co-located administration, control room and change house and will be supported with:

- Vehicle workshops with specialist facilities
- Plant workshop and warehousing facilities
- Fuel and hydrocarbon storage facilities
- Waste transfer facility
- Waste management facility for segregation of both salvageable and putrescible waste. It has been assumed that used hydrocarbons and wastes classified as toxic will be disposed of offsite by a certified external contractor, with costs included in site operating costs.

These facilities have been sized according to manning and equipment requirement estimates.

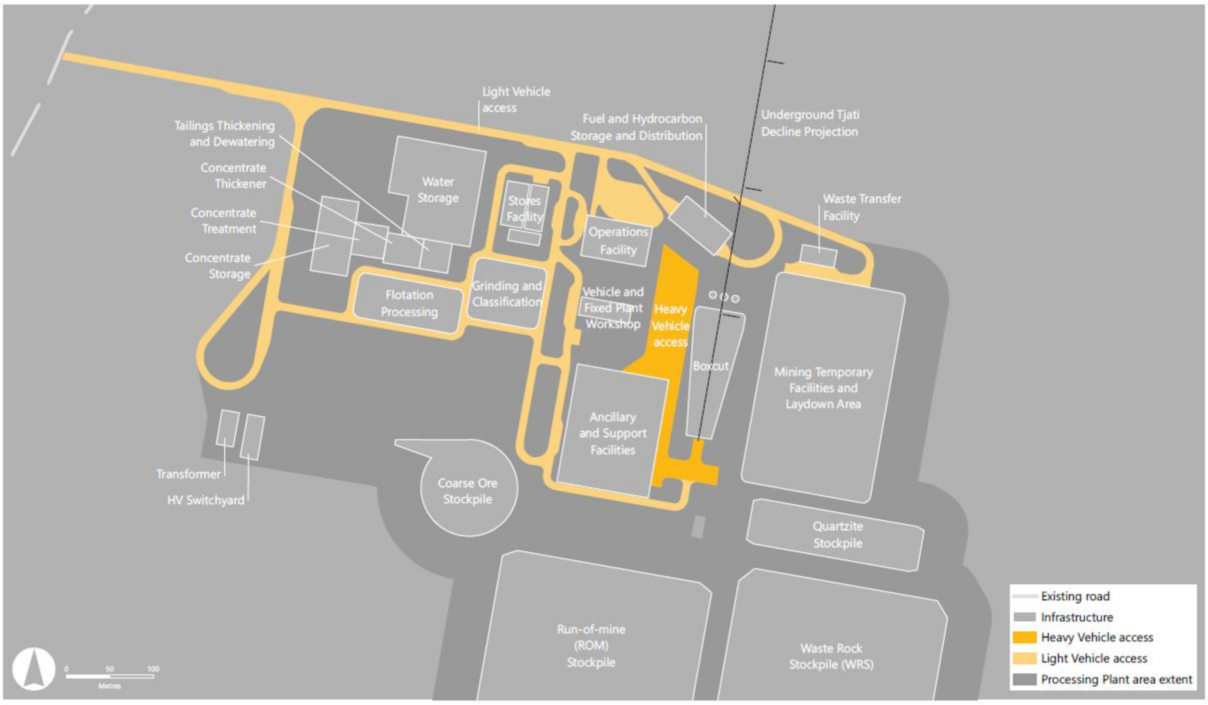

Figure 1.19: Layout of Site Facilities

1.16.6 Waste Management Facilities

Provision has been made for temporary storage of all solid waste generated on site. The area will consist of a 20 m x 20 m hardstand area which will contain storage for bins and skips. A 20 m x 20 m bunded covered area is provided for storage and bioremediation of hydrocarbon contaminated soil.

General waste will be collected from clearly marked and segregated bins/skips within the work areas and transported to the storage area where it will be placed into the appropriate bin/skip for transportation off site. Putrescible waste will be segregated from the general waste and will be transported off site for disposal.

During the Feasibility stage of the study, the option of a site landfill will be investigated for the disposal of general operational non-hazardous wastes in accordance with relevant SA EPA Guidelines for a class SB-landfill. It is anticipated that approximately 1,000 t of waste material will be disposed of to the landfill each year.

Materials not suitable for landfill will be stored at the storage area for disposal off site by a certified contractor to a licensed waste disposal facility. Such waste will be contained to prevent accidental release which could cause contamination.

1.16.7 Fuel and Oil Storage and Distribution

The design of the fuel and oil storage and distribution facilities allows for a central vehicle refuelling facility and a secondary refuelling facility located adjacent to the emergency power facility. Given the site's proximity to Port Augusta and the intention to construct an all-weather site access road, an operational on-site storage capacity of seven days has been allowed. Supply from off site will be via road train tankers, which will unload within a suitably sized bunded apron with provision for spill containment. The unloading and dispensing pump sets are arranged by service and located in a separate bunded area immediately adjacent to the tank farm.

Waste oils and greases will be collected and stored in storage tanks. Waste oil repositories located at the lubrication storage area and the Heavy and Light Vehicle Workshop will be pumped into the waste oil storage tank.

1.17 Operations Management

OZ Minerals operates its producing assets through a devolved operating model, which means that each asset is responsible for delivery against an agreed business plan. Each asset has the ability to make key operational decisions that must comply with Governance Standards, and provide accurate and timely information as required. Operating sites are accountable for asset-based delivery of safety, volume and cost performance at the asset level. OZ Minerals' Corporate role is to guide, govern and invest in a manner consistent with the Company's strategy.

Under the OZ Minerals devolved operating model, operating assets are structured to be self-sufficient, with defined support from the Corporate centre. The operating structure for both the Carrapateena Project and CTP will be reviewed and optimised through the Feasibility Study and Operational Readiness planning.

1.17.1 Workforce

Ore production and processing will be conducted on a 24 hours per day, seven days per week basis. Managerial, supervisory and technical staff will work a nominal 12 hours per day on dayshift, while shift production employees will work a continuous 12-hour shift roster. Production employees will generally work a nominal three panel, two x 12-hour shift roster.

All site-based employees and contractors will be accommodated in the accommodation village built to support the operations and will attend the site on a bus-in/bus-out basis from the Upper Spencer Gulf and regional communities.

A contracted services mining operation has been assumed for the purposes of this study, however the benefits of owner-operated mining will be further explored during the Feasibility Study.

1.18 Logistics

Concentrate will be loaded into containers for shipment by road transport to the CTP, domestic customers or export. This is similar to arrangements already in place for the OZ Minerals' Prominent Hill operation.

1.19 Environment

The environmental baseline was commenced in 2007 under the previous owner's program managed by Teck. It has been further developed by OZ Minerals, initially focussed within the originally approved Retention Lease (RL 127) boundary. Baseline data collection has continued to take in the potential infrastructure corridors and to further develop a regional groundwater model, inclusive of watercourse springs, surface water systems and ecosystem connections.

The Carrapateena Project is located in the Gawler Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion, which is characterised by semi-arid to arid, flat topped to broadly rounded hills of the Gawler Range Volcanics and Proterozoic sediments. To the north of the existing RL 127 is the ephemeral salt lake, Lake Torrens.

The Carrapateena Project is located on a low sandstone and quartzite plateau with an undulating surface of aeolian sand or gibber. There are colluvial footslopes and creeks dominated by bluebush/saltbush and open chenopod shrub lands.

The climatic condition for the Carrapateena Project area is described as an arid climate with high temperatures, very low rainfall and high evaporation rates throughout most of the year. Annual rainfall recorded on site averages around 200 mm, but is highly variable month-to-month and year-to-year. The mean monthly rainfall is approximately 16.5 mm, but in the last four years has varied between 67 mm and zero. Evaporation is not measured in the Carrapateena area. Data for Woomera indicates evaporation rates of around 3,100 mm/year, peaking in January (450 mm/month) and dropping to 90 mm/month in June. Temperature ranges between 20°C to above 35°C during summer months (November to March), and 5°C to 25°C throughout the winter months (April to October). Average wind speed for the area is 4.1 m/s, with peak wind speeds exceeding 14 m/s, with a prevailing southerly wind direction.

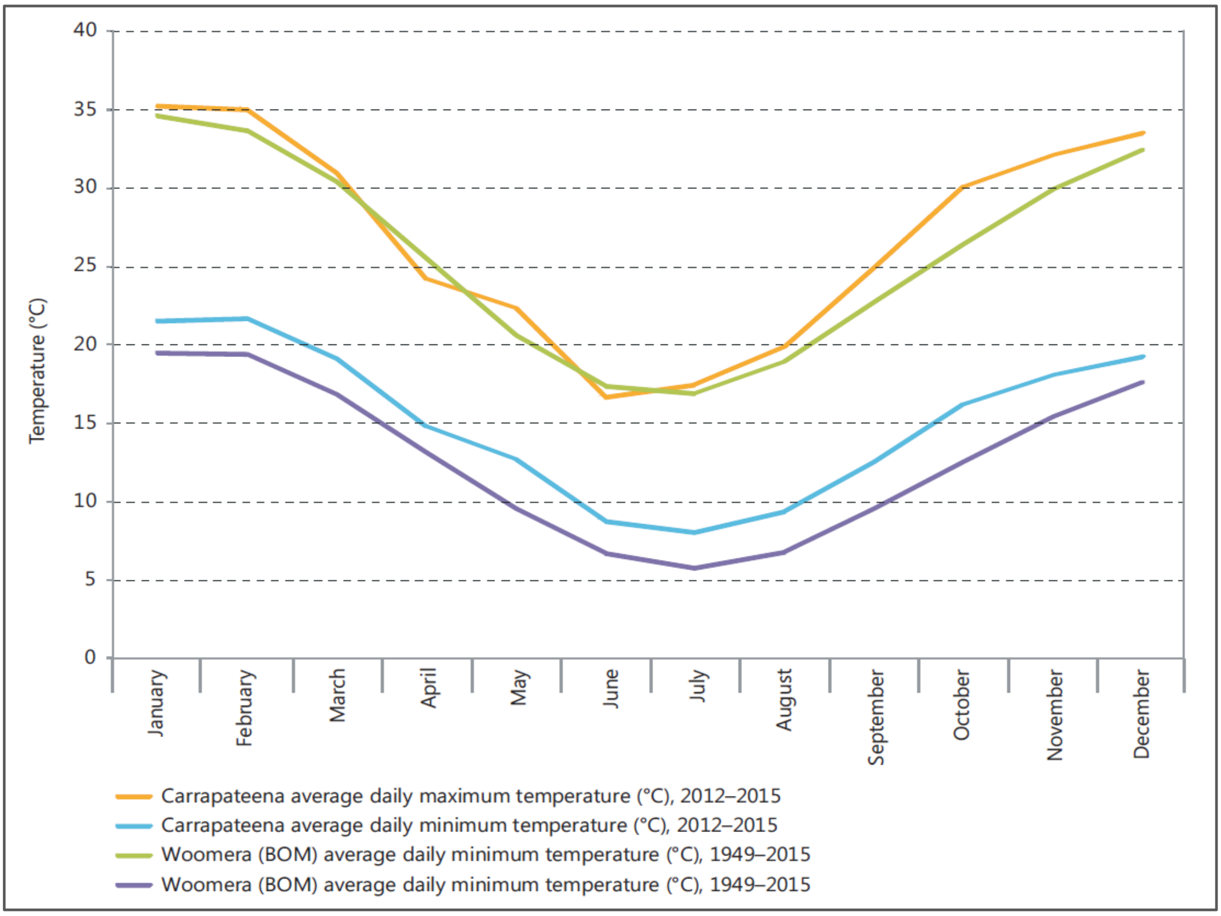

Figure 1.20: Carrapateena Project Area Temperatures

Local drainage for the Carrapateena Project area is dominated by Eliza Creek and associated tributaries. The western portion of the processing plant, western infrastructure corridor and accommodation village are within the Salt Creek catchment. Both the Eliza Creek, Salt Creek and associated tributaries are non-perennial streams that only flow after rain events. The receiving water body of both creeks is Lake Torrens. Two watercourse springs are located at the terminating end of Salt Creek.

The hydrogeological system of the area is dominated by hard rock lithologies of South Australia's Gawler Craton and bounded by Lake Torrens in the east. The hard rock aquifers are heterogeneous and typically report saline to hypersaline water quality. Within the area there are three main aquifer systems, the Tent Hill Aquifer, Whyalla Sandstone (which has the characteristics of an aquifer off lease where the fracture permeability has been found to be relatively high) and Pandurra Formation. Groundwater discharge occurs through salt (playa) lakes with Lake Torrens acting as the dominant regional evaporation sink for both surface water and groundwater.

The studies to determine the effect and impact of the Carrapateena Project on the baseline environment, including land, air, surface water, groundwater, ecology, social infrastructure, local community and heritage has been undertaken. The overall environmental impact from the Carrapateena Project is low and the risk profile is low. The Carrapateena Project's environmental impact assessment will be reported in detail within the Mining Lease Proposal and the Miscellaneous Purposes Licence Management Plans which will be submitted to the regulatory authority and released for public comment.

1.20 Ownership, Regulatory Approvals and Land Access

The Carrapateena Project and CTP are owned 100% by OZ Minerals Limited through its wholly owned subsidiaries.

The applicable legal jurisdiction is that of South Australia. Mining operations in South Australia are conducted in accordance with the requirements of the *Mining Act 1971* (SA) (**Mining Act**). The Mining Act is administered by the Government of South Australia's Department of State Development (**DSD**). OZ Minerals has developed positive relationships with South Australian regulators as a result of the Prominent Hill operation and believe this will continue through the Carrapateena Project development.

The legal framework, including tenure, land access and royalties related to the Carrapateena Project and CTP, is based on the regulatory process under the Mining Act. Of note, subject to approval of an application to the relevant Minister, a discounted royalty rate of 2% of revenue will be applicable for the first five years of production. Other relevant South Australian legislation is applicable and will be complied with in relation to the Carrapateena Project and CTP.

The primary regulators for the Carrapateena Project and CTP are the Government of South Australia's DSD who regulate mining activities in the state through the Mining Act and the Australian Government's Department of the Environment and Energy (**DoEE**) who administer the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). Additionally, OZ Minerals works closely with the Government of South Australia's Environmental Protection Authority and the Government of South Australia's Department for Water, Environment and Natural Resources as two key stakeholders in the primary approvals for the Carrapateena Project and CTP.

The key land access stakeholders are the Kokatha People, who have Native Title Determination over the Project area, and the pastoral lease holders of Pernatty Pastoral Station, which covers much of the Project area.

A regulatory approvals and land access plan is underway to ensure the appropriate regulatory approvals and land access are in place prior to the commencement of site activities. The environmental assessment is well progressed and submissions will occur shortly enabling the approvals to be complete in time for on-site construction activities to begin.

The development of the advanced exploration decline is being conducted under the existing RL 127.

All operations post approval will operate under a single regulatory document as one consolidated Program for Environment Protection and Rehabilitation (**PEPR**).

The Approvals Schedule is shown in Figure 1.21.

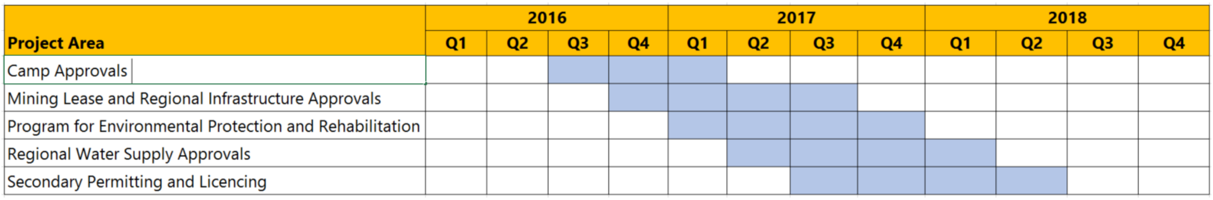

Figure 1.21: Approvals Schedule

1.21 Community Relations

OZ Minerals' stakeholders include a wide range of individuals and groups that may be directly or indirectly supportive of, influenced by or impacted by our activities. Stakeholders are categorised based on their influence and interest in the Carrapateena Project. An innovative state government 'pre-lodgement engagement hub' was held over two weeks during this study to review the project design and environmental assessment. Further Community presentations were given in Woomera, Roxby Downs and Port Augusta with over 150 people coming to participate in community consultation efforts.

OZ Minerals has established strong relationships with stakeholders to ensure they are involved in the ongoing development of the Carrapateena Project. Support for the Carrapateena Project and CTP across all stakeholders remains positive.

OZ Minerals holds regular meetings with Australian, South Australian Local government and non-government organisations and service providers, and has implemented a process to ensure this is ongoing through the future stages of the Carrapateena Project. Operations will continue to manage this through an Operational Environment and Community Management Plan.

1.22 Human Resources and Industrial Relations

OZ Minerals' approach to developing a Human Resources and Industrial Relations plan for the Carrapateena Project and operations will be underpinned by the way we work together, utilising the following principles consistent with the OZ Minerals strategy:

- Thinking and acting differently
- Building a culture of respect that enables our people to succeed
- Focusing on partnerships and collaboration
- Delivering superior results through effective planning and agile deployment
- Doing what we say we will do and taking action
- Acting with integrity and engaging with our stakeholders.

The operation will be integrated into and will prioritise the Upper Spencer Gulf region, ensuring value creation for local communities and greater workforce certainty and stability.

The Carrapateena Human Resources function will adopt existing OZ Minerals Corporate Policies and Standards for the Project during the execution phase, and develop specific procedures and practices in the operations and decommissioning phases.

The OZ Minerals Recruitment and Selection Standard is in accordance with the requirements of the relevant legislation, including providing equal opportunity for those who may be disadvantaged within the community. OZ Minerals' current agreements reference a commitment to engage Kokatha people and provide employment where practicable, on the same terms and conditions as all other employees. OZ Minerals is committed to a diverse workforce consistent with its policies. The aim is to outperform gender participation in the resources and minerals sector and ensure we adopt a broader approach to diversity and inclusion.

All OZ Minerals employees are currently engaged on individual common law employment contracts. Any new employees at Carrapateena will be similarly aligned and will be administered by OZ Minerals Human Resources in the study phase and by a Carrapateena Human Resources on-site team during execution and operations phases. It is envisaged that a large number of the services required to be undertaken at Carrapateena will be outsourced to external contractors. OZ Minerals will manage the risk associated with personnel engaged by external contractors by establishing and managing activity through a defined Human Resources Management Plan and Industrial Relations Management Plan relevant to each contractor's activity.

Further assessment of Industrial Relations risks and requirements will be extended into the Feasibility Study and Operational Readiness planning.

1.23 Technology and Information Systems

The current approach to planning operational technology and information systems for the Carrapateena Project and CTP is to take advantage of the most up-to-date technologies where there is a clear business case, have a high level of process automation (including underground mining functions) and to make operational and business information highly accessible to support agile decision making.

Technology and information systems will provide robust foundational elements, to enable current and future capability requirements of the Carrapateena Project. Supporting a devolved operating business model with alignment to IT business standards may mean at times OZ Minerals will take a consolidated approach to decisions on core technologies rather than the Carrapateena Project operations team making independent decisions on technology and systems. These decisions will at all times ultimately support and enhance the delivery of the OZ Minerals devolved operating model.

Standard control systems with integrated site operations, digital voice radio and CCTV coverage will support the operational philosophy of a highly automated plant and process. A single control room will be established on site to accommodate and drive collaboration along the mine/processing value chain. Capability to move to Remote Operations in the future has been considered and where appropriate has been factored into the design. Key communications components include a high-speed and reliable Telstra fibre connection to site, 4G cellular coverage and site-wide redundant fibre network.

Proven and established technology and information systems capable of leveraging IoT (Internet of Things) and Machine Learning will be used to provide solutions over the life of mine. Wherever possible, systems will be hosted off site using proven cloud technologies. Enterprise systems (including SAP, Office 365, INX) will be extended to ensure standardised core business processes and business-wide collaboration. This will enable effective use of data for control, monitoring and visibility of operations; supporting real-time data-driven decision making and predictive analytics.

1.24 Capital Costs

The pre-production Capital Cost estimate for the Carrapateena Project is ~A$830 million excluding GST and including contingency, or ~A$980 million including the proposed CTP.

This Class 4 estimate was developed to comply with the Project Estimate Plan and Project Minimum Standards.

Included in the Capital Cost estimate are costs up to the Project completion in H2 2019, which is the scheduled date when steady state operation of the copper concentrator is possible.

Key exclusions are sunk costs, GST, costs beyond the Project completion date, changes in foreign exchange and escalation beyond the estimate base date.

The estimate base date is 1 September 2016. Exchange rates are per the Project Estimate Plan (Closing rate 29 June 2016 and consensus long-term average for AUD:USD).

Table 1.11 summarises the Project Capital Cost estimate excluding GST.

Table 1.11: Capital Cost Summary

Description	Value (A$ million)	Age (%)
Mining	184	22
Processing	153	18
Infrastructure	184	22
Project Costs and Services	114	14
Owner's Costs	195	24
Total (including Contingency, excluding CTP)	**830**	

The majority of pricing (81%) was based on Tendered/budget quotation, mostly by multiple or single source. Historical cost accounted for 13%, and factored costs amounted to the remaining 6%.

A management contingency amount has been selected to give a better than P90 confidence level (i.e. 90% probability of under-run). Accuracy was calculated as exceeding the requirements for this level of study using the inherent quantitative analysis minimum and maximum ranges divided by the base estimate.

Figure 1.22 illustrates the base estimate on the left (A$830 million including pre-production costs and excluding CTP and contingency) and the range of cost covered within the Capital Cost total estimate.

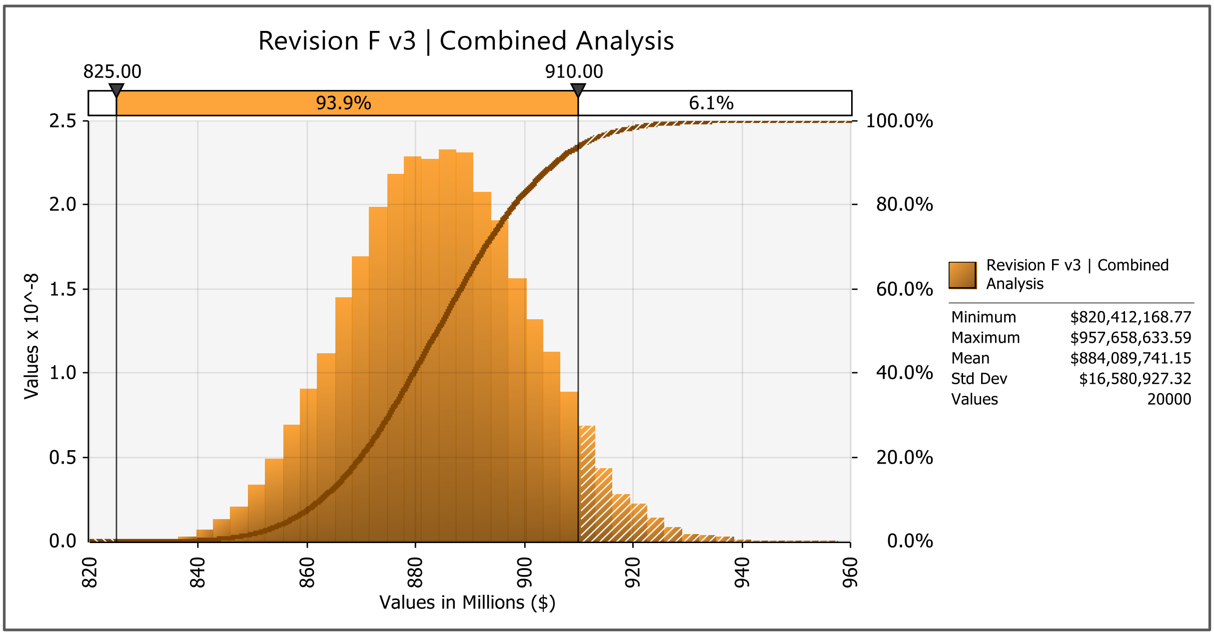

Figure 1.22: Contingency and Accuracy Analysis

1.25 Operating Costs

The Operating Cost estimate amounts to ~A$48/t life of mine.

This Class 4 estimate was developed to comply with the Project Estimate Plan and Project Minimum Standards with an expected accuracy of better than 20% to 25%.

Included in the Operating Cost estimate are costs from the Project completion date (June 2019).

Key exclusions include closure costs, GST, contingency, changes in foreign exchange, depreciation, legal costs, amortisation and escalation beyond the estimate base date, however these are accounted for in the financial modelling.

The estimate base date is 1 September 2016. Exchange rates are per the Project Estimate Plan (Closing rate 29 June 2016 and long-term consensus average for AUD:USD).

Table 1.12 summarises the Operating Cost estimate by cost area.

Table 1.12: Operating Cost Summary (excluding CTP)

Description	A$ Per Tonne Life of Mine
Operating Costs	48.30
Mining and Material Handling	23.80
Processing	16.10
General and Administration	4.10
Logistics	4.30
Sustaining Capital	7.50

The scope of Operating Costs includes:

- Mining and Material Handling includes development, drill and blast, load and haul, mine services, supervision and technical support.
- Processing includes all processing, laboratory and tailings management, and excludes concentrate treatment costs, however these (CTP treatment costs) are accounted for in the financial model.
- General and Administration includes administration salaries, site supplies and services, site administration, travel and accommodation, insurances, legal and SHEC compliance.
- Logistics includes concentrate treatment costs.

Sustaining Capital is required during the operation phase of the mine to advance mining operations, replace items of plant that have reached their maintainable and useful life, and planned expenditure required to build or modify equipment or infrastructure items necessary to sustain operations at the rated capacity.

1.26 Carrapateena Project Execution

The Carrapateena Project will be developed based on a continuation of OZ Minerals staged Capital Investment System of six primary stages of structured review and gated commitment. Each of the development phases are guided by minimum standards to ensure sufficient information is provided to support investment decisions. The stages are outlined in Figure 1.23.

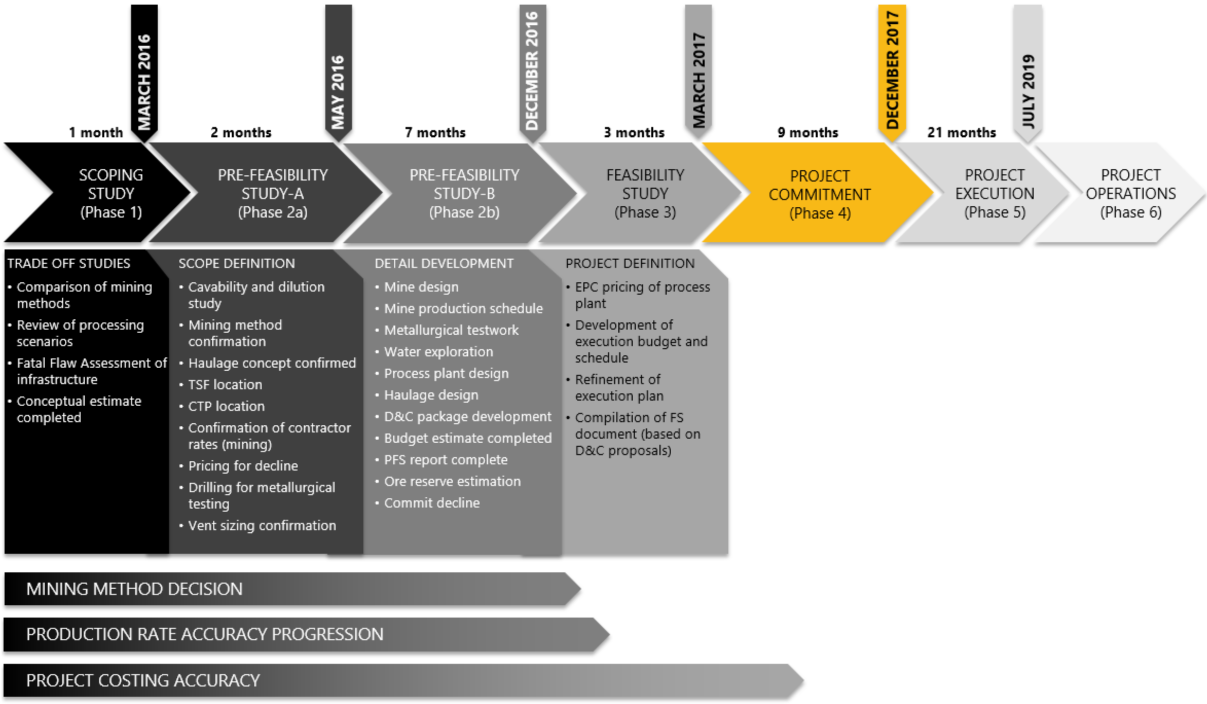

Figure 1.23: Carrapateena Project Phases and Timing

A further deliverable of the current PFS phase is the development of the technical and commercial basis and preferred bidder list for the Engineering, Procurement and Construction (**EPC**) of a 4 Mtpa Copper Concentrate Processing Facility and related infrastructure works. This package is intended for bidding at the end of November 2016 to allow offer submissions in Q1 2017 with award expected for late 2017.

The EPC Design and Construct tender package developed during the PFS phase will be competitively bid, and recommended bid details presented as part of the report that will form the basis of the Feasibility Study. The remaining portions of work not issued in the EPC package will be estimated internally and based upon well advanced designs and firm offers for the majority of works.

The following critical decisions are now finalised and form the basis of the Feasibility Study:

- Mining method and production profile
- Mine haulage system
- Power supply
- LOM surface facilities locations, camp, borefield location (subject to further drilling outcomes)
- Tailings Storage Facility location and sizing.

Carrapateena Project completion is anticipated in H2 of 2019.

The execution schedule has been developed in accordance with the following key principles:

- Execution of a Feasibility Study in tandem with orebody access and ongoing approvals and permit applications, geotechnical and hydrogeological investigations.
- Progressive Board approvals to allow execution of critical path works on a de-risked basis.
- Mining Lease Approval in order to achieve early mobilisation of key contractors.
- Completion of infrastructure and minerals processing plant construction to coincide with the expected earliest date for commissioning.
- The minerals processing plant construction schedule has been determined to match availability of ore from the SLC mine to support concentrate production at a practicable process plant throughput.
- Mining output rate then continues to ramp up until the target 4 Mtpa ore production rate is achieved.

Note that all costs associated with operating the plant and infrastructure prior to Project completion (pre-production costs) are capitalised.

The execution schedule key milestones are listed in Table 1.13.

Table 1.13: Key Schedule Milestones

Milestone Description	Target (End Of)
Completion of PFS Report and Board approval	Q4 2016
Receipt of Mining Lease Offer and Federal Government Approval	Q1 2017
Selection of Preferred Bidder for Process Plant Design	Q1 2017
Completion of Feasibility Study and Board approval	Q1 2017
Completion of major contract packages and Board approval	Q4 2017
Site Mobilisation of Process Plant Contractor	Q1 2018
First Development Ore trucked from underground	Q4 2018
Commence Commissioning of Process Plant	Q2 2019
Project Completion	H2 2019

The Carrapateena Project will be developed based on a continuation of the OZ Minerals staged Capital Investment System of six primary stages of structured review and gated commitment. Each of the development phases are guided by minimum standards. The Execution strategy planned for the Carrapateena Project is based on industry standard models but configured to balance execution risks with the level of definition and the ability of the party to best manage the risks.

This translates to a project managed by an Owner's Project Team (in lieu of a traditional EPCM approach). The Owner's Project Team will provide oversight and governance and directly manage a number of engineering, equipment procurement and construction services packages.

1.26.1 Project Packaging and Execution

The engineering, equipment procurement and construction services packages will primarily consist of:

- An EPC package for the process plant (and related infrastructure)
- A schedule of rates contract for development of the decline and underground development
- Contractor mining with a view to change to owner operation
- Engineering Services related to earthwork and infrastructure design and procurement
- Site Services contracts and minor procurement
- Lump sum and/or schedule of rates contracts for miscellaneous packages such as:
    - Mine infrastructure such as ventilation, dewatering and services
    - Mine conveyor and crusher
    - Accommodation village
    - Borefield and water supply
    - Tailing Storage Facility
    - Site bulk earthworks, roads and drainage
    - Communications and ICT infrastructure
    - Western access road.

Detailed package descriptions, interface points, support services requirements and associated interface risk assessments will be developed in the early part of the Feasibility Study to support development of the Project Execution Plan.

The execution strategy is based upon an owner's team structured to execute the next stages of the Carrapateena Project in order to leverage the weak market and availability of external services. This will also focus efforts on business needs. It has been identified that by seconding the correct resources directly into the Company, skill sets can be obtained without conflicting commercial objectives that govern external consultancies, and these services are readily available in the current market.

1.26.2 Governance Structure

The Carrapateena Project will be delivered in an unconventional manner in order to expedite delivery. Accordingly, a strong governance, advisory and steering committee structure is envisioned to ensure regular and frequent interaction between the Carrapateena Project, CTP, OZ Minerals executives and the Board to ensure issues are promptly identified and quickly dealt with, and the Carrapateena Project and CTP team have access to all necessary resources and decision making. The governance structure is shown below. The features of this structure include:

- A Steering Committee comprised of key OZ Minerals Executives.
- An Advisory Committee comprised of independent technical and project execution experts. The Advisory Committee will report to the CEO and engage with both the Carrapateena Project Team and CTP Team on a regular (two-monthly) basis to review progress, issues and concerns.
- Independent Peer Reviewers will be engaged at each key toll gate or decision making point (for example, at the end of the PFS and at the end of the Feasibility Study) to review technical, commercial and execution planning recommendations. This will ensure that the necessary level of work has been completed and recommendations are soundly based. The reviewers will not have had prior involvement in the works and will perform an audit and compliance checking function.

The governance structure is shown in Figure 1.24.

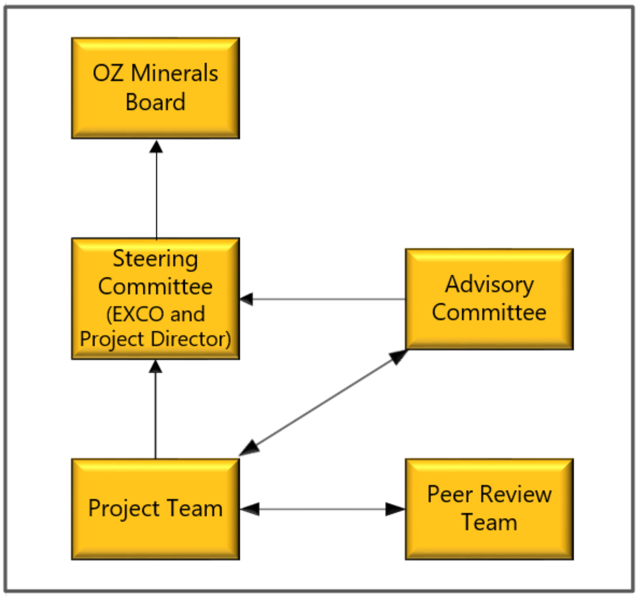

Figure 1.24: Governance Structure

1.27 Financial Analysis

The cumulative NPV over time at consensus commodity prices and exchange rates using a 9.5% discount rate shows that the Carrapateena Project including the CTP has an NPV of approximately A$770 million. The cumulative NPV is approximately A$820 million excluding the one off deferred consideration payment of US$50 million.

At current spot commodity prices the NPV reduces to circa A$160 million and demonstrates that the economics of the Carrapateena Project including the CTP are sound.

1.27.1 Price Sensitivity, Net Cashflows and NPV

The sensitivity analysis of the NPV to key variables, including copper and gold price, US$ exchange rate, copper grades in ore milled, indicates that the Carrapateena Project is robust. The Carrapateena Project including CTP is most sensitive to the AUD:USD exchange rate, with copper price and then copper grade being the next most significant variables. Mine plans can be optimised in response to a change in commodity prices, based on the direction of the change in commodity prices. The sensitivity analysis looked at changes of between +10/-10 percent for copper, gold, FX and grades mined and processed, and +20/-20 percent for Capex. The Carrapateena Project and CTP did not present one scenario which had neutral or negative NPV at these combinations.

The net cashflows from the Carrapateena Project combined with the CTP have improved compared to the Scoping Study estimates, driven mainly by the improvement in copper and gold grades in mined ore as a result of the mining schedule optimisation carried out during the PFS. The estimated capital expenditure is higher earlier in the mine life and revenues slightly delayed due to timing of installation of crushers combined with the lower commodity price assumptions. These impacts result in the calculated NPV of ~A$770 million, assuming a discount rate of 9.5%.

The commodity price, foreign exchange and marketing assumptions that are the basis of the financial valuations carried out during the PFS are shown in Table 1.14. These are based upon a representative range of analyst forecasts issued in September 2016.

Table 1.14: Commodity Price, Foreign Exchange and Marketing Assumptions

Year	2016	2017	2018	2019	2020	LOM
Pricing Assumptions						
Copper, US$/lb	2.14	2.17	2.36	2.53	2.85	2.87
Gold, US$/oz	1,273	1,364	1,336	1,339	1,353	1,226
Silver, US$/oz	17.0	19.0	19.0	19.0	20.0	19.0
Exchange Rate Assumptions						
AUD:USD	0.73	0.72	0.72	0.73	0.74	0.75

The Carrapateena Project including the CTP is NPV neutral or provides a 9.5% return on capital at a copper price of US$1.97/lb and spot gold and silver prices of US$1,270/oz and US$17/oz respectively, assuming a USD:AUD exchange rate of 0.76. At this NPV breakeven price, the Carrapateena Project including the CTP has a payback period of 12 years.

The Carrapateena Project including CTP charges generates high cash flows in the first five years of full production from 2020 to 2025 – though slightly lower revenues in 2019 compared to Scoping Study outcomes. Table 1.15 shows the average cashflow for the first five years.

Table 1.15: Average Cashflow

Average Cashflow	2020 to 2025 (A$ million)
Net Revenue	583
Net Costs	(192)
Operating cash flow	391
Total Capital	(61)
Cash Flow Pre-tax	330
Tax	(80)
Net Cash flow	250

Assuming consensus commodity prices, the payback period from commencement of the Carrapateena Project including the CTP is seven years (four years from commencement of production) and compares to six years for the Scoping Study. This is the result of revised estimation of the timing of pre-production capital expenditure, and the impact of lower revenue generated as a result of lower commodity price assumptions ~5% as well as reduction in copper production in 2019, as mentioned in the mining and processing sections, further extended the payback period and reduced the IRR compared to the Scoping Study outcomes. While the OZ Minerals estimate of payback period is conservative and more prudent as it is based on the time from when the expenditure for the project commences (mid 2016), a more common estimation of the payback period – one that is measured from the time production commences – is estimated at a much lower four years.

The key difference of the Carrapateena Project and CTP capital expenditure profile from the Scoping Study is the earlier and higher spending estimated in 2018 which leads to a slightly lower IRR compared to that calculated in the Scoping Study. Revised sustaining capital expenditure has also impacted calculated IRR and optimisation of the capital profile remains as an opportunity to improve financial outcomes.

The calculated NPV assuming consensus commodity prices and discount rate of 9.5% is A$770 million and has been significantly improved by mine re-scheduling. The main impact on NPV is the improvement in revenue as a result of a sustained improvement in the mined grades over the life of mine which is discussed above. Compared to the Scoping Study, the NPV has been affected by lower commodity prices and as such while these prices are based on analyst concensus at particular times, they are subject to significant change and present an opportunity as well as a threat to the financials of the Carrapateena Project and CTP. The increase in mining, processing, transport and services costs as a result of better definition and scoping of the Carrapateena Project has partially offset the net benefit from the better grades. The manner in which the calculated NPV has changed from the Scoping Study to this PFS are graphically represented in Figure 1.25.

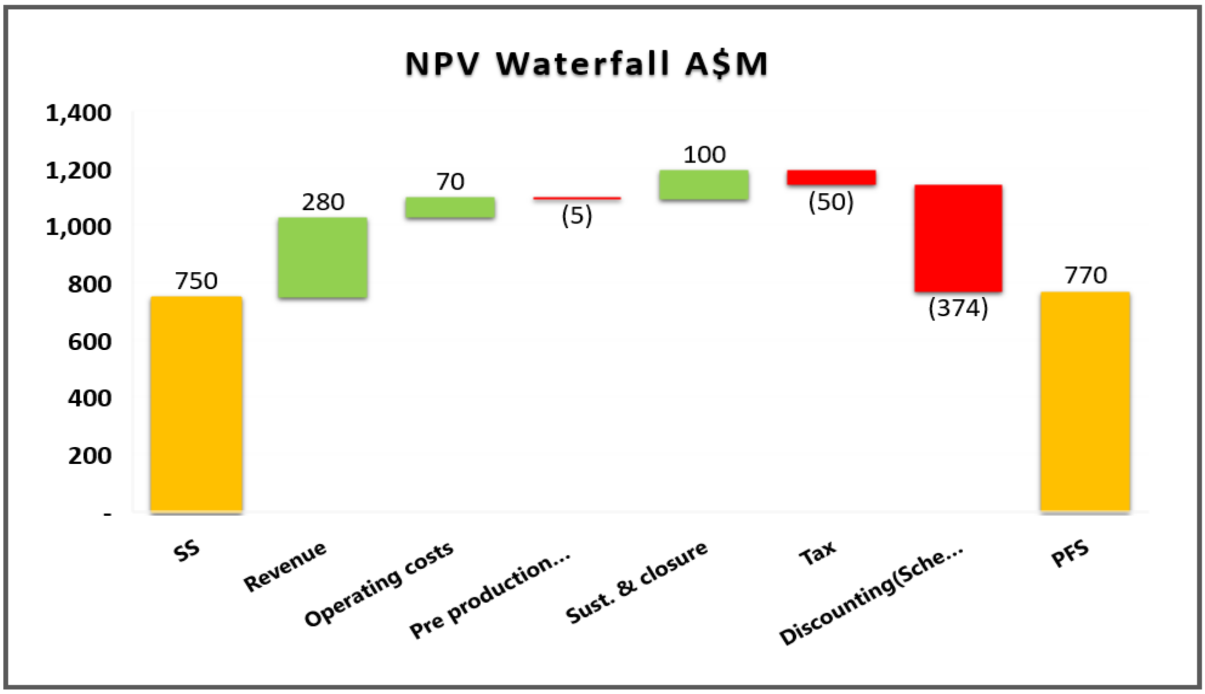

Figure 1.25: NPV Waterfall

The Life of Mine C1 cash cost for the Project (as shown in Figure 1.26) is estimated to be US82c/lb including all CTP charges, which places the Project in the lowest half of producers of copper concentrate globally. In the first three years of production, C1 cash costs are within the lowest quartile at ~US50c/lb (including CTP charges). The LOM sustaining capital costs amount to US10c/lb and is estimated at US39c/lb in the first three years. The CTP has been modelled on the same basis as the prior Scoping Study pending completion of the current Front End Engineering and Design Study.

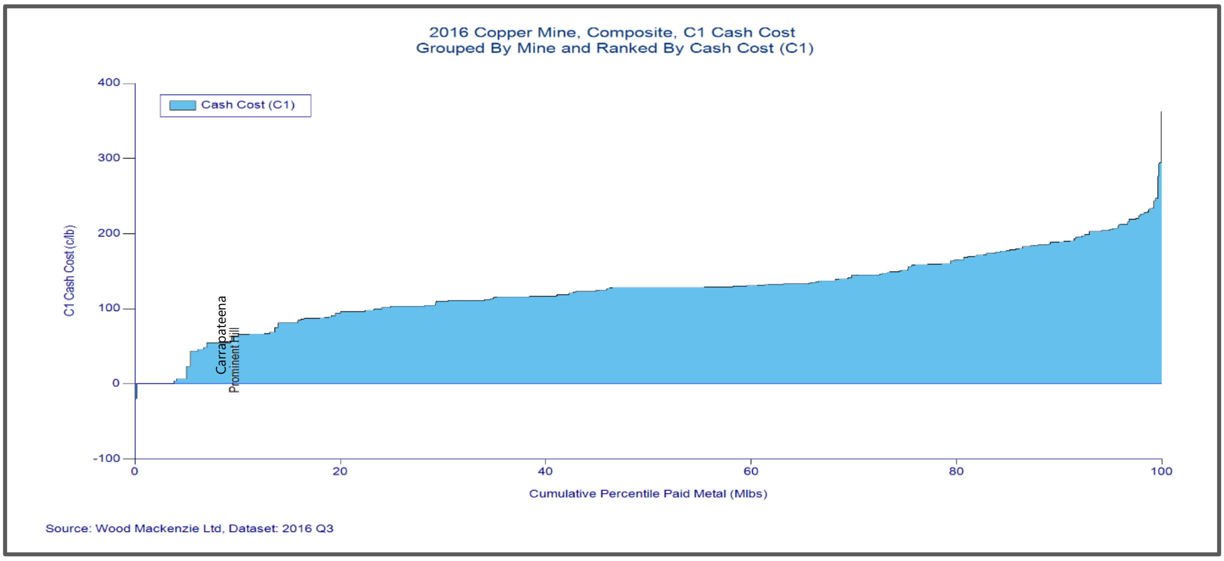

Figure 1.26: Carrapateena Cost Curve Position

1.27.2 Funding

The objective of the funding plan is to provide certainty of Carrapateena Project and CTP development, with financial risks assumed, and provide OZ Minerals with flexibility to pursue other growth opportunities.

The scale of the development is such that OZ Minerals will have the capacity to self-fund the development of both the Carrapateena Project and CTP based on current projections of Prominent Hill cash flows.

However, to maintain optionality in funding other growth projects of the Company, finance work streams are in place to ensure that the Carrapateena Project and CTP are bankable on a stand-alone basis.

Finance work streams include:

- Construction and contracting strategy
- Reserve life of mine requirements for debt financiers
- Operational readiness
- Offtake and sales marketing and commercial arrangements
- Power and water supply arrangements
- Standalone credit metrics for bankability to be assumed for appropriate debt sizing analysis
- Early engagement with current bank lending panel (underway)
- Standalone Project debt sizing to be within the Company's stated group policy of conservative gearing; Debt / EBITDA < 1.5x and Debt / Capital < 25%.

Initial observations are that the Carrapateena Project and CTP are suitable for a conventional standalone debt financing and also can be funded on a corporate basis and within the current financial policy. There is a level of flexibility as to if and when debt financing could be implemented, due to the Company's current high cash balance and cash generation from Prominent Hill.

A standalone debt financing solution offers flexibility and preserves optionality to the highest level possible, but is more complex (and higher cost) to implement and will still call on the corporate balance sheet for completion support during the construction phase. The extent and form of the completion support will, in part, depend on the underlying completion risk and allocation.

A range or combination of options are open to OZ Minerals to fund the development of the Carrapateena Project and CTP. These include corporate bank debt, project finance, high yield US dollar issue, the term loan B market, leasing and export credit agency options, convertible notes, royalty based capital, equity at both the Carrapateena Project and CTP level and equity at the corporate level.

1.28 Key Outcomes

This PFS has confirmed prior study work, provided better definition of the Carrapateena Project and CTP and concludes that they are technical achievable and economically viable.

The smaller, faster to develop mine fits with OZ Minerals strategy, allowing OZ Minerals to self-fund the Carrapateena Project and CTP if it chooses to do so, and is underpinned by a Project Execution Schedule that bring them both into operation in a timely manner.

Further work during the early stages of the Feasibility Study is planned to further define the Project, complete the execution plan development and capture further available opportunities.

Both the Carrapateena Project and CTP are well defined for this level of study and the enabling early works program, Feasibility Study and Execution planning is detailed in the following sections.

1.29 Future Work Plan

The Carrapateena Project and CTP will be subjected to a Feasibility Study. The key purpose of this additional study would be to confirm the economic and technical viability at a greater level of certainty and develop execution plans to control level definition.

A forward work plan with associated schedule and budget has been developed and includes:

- Metallurgical test work completion
- Further engineering definition including business requirements workshops for key infrastructure
- Completion of power supply connection agreement
- Investigation of onsite generation and load management technologies
- Development of Operational Readiness Plans
- Additional orebody definition drilling
- More detailed mine development scheduling
- Decline development
- EPC bidding for the Minerals Processing Plant
- Project approvals and land access agreement finalisation
- Development and approval of the Project Execution Plan and KPIs
- Confirmation of key business outcome requirements.

Proposed Key Performance Indicators (KPIs) for the following phase of the Project are listed in Table 1.16.

Table 1.16: Feasibility and Execution KPIs (excluding CTP)

Carrapateena Feasibility and Execution KPIs	
KPI	**Metric**
Schedule	
Complete PFS Peer Reviews	Q1 2017
Complete FS Report	Q1 2017
Mobilise Process Plant Contractor	Q1 2018
Access First Development Ore	Q4 2018
Access First Production Ore	Q1 2019
First Ore to Process Plant	Q2 2019
Commercial Operation	H2 2019
Budget	
Approved Budget to Q1 2017	A$84 million
Business Case	
Preproduction Capex	~A$830 million
NPV @ 9.5% and Cu US$2.87/lb Au US$1,226/oz	~A$770 million
IRR	~20%

1.30 Study Standard and Level of Definition

The PFS has been completed in accordance with the OZ Minerals capital investment standard and Minimum Standards guidance and outputs summarised below in Table 1.17.

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Table 1.17: Study Class Assessment

KEY	**Less Than** the Minimum Standard for Class 4 Study and Estimate	**Achieved** the Minimum Standard for Class 4 Study and Estimate	**Superior to** the Minimum Standard for Class 4 Study and Estimate	
ESTIMATE CLASS	**SCOPING STUDY – PHASE 1**	**PREFEASIBILITY STUDY – PHASE 2**	**FEASIBILITY STUDY – PHASE 3 AND INVESTMENT DECISION QUALITY**	**PROJECT EXECUTION PHASE 4 – DEFINITIVE ESTIMATE**
	Class 5	**Class 4**	**Class 3**	**Class 2**
Level of Definition (expressed as a percentage of complete engineering using appropriate indicators i.e. % of EPCM, % of Engineering Cost)	1% to 2% of full project engineering definition	10% to 15% of full project engineering definition	15% to 25% of full project engineering definition	40% to 60% of Full Project Definition being completed with minimum 60% engineering completed, minimum 40% procurement by value fixed by quotation and minimum 10% construction fixed by quotation or tender
Typical Accuracy Range based on the P10 and P90 levels	**± 30 to ± 35%** ***NOTE: for novel technology or underground projects for which there are no benchmarks the accuracy maybe +35 to +50%***	**± 20 to ± 25%** **Note Achieved accuracy higher than benchmark but not quite Class 3**	**± 10 to ± 15%**	**± 5 to ± 10%**
Quotations / Tenders – Supporting the Estimates	None – Benchmark Data from existing mine, rail and port contracts	Equipment Quotes and benchmark material supply and construction rates. Mine, rail and port contracts factorised from existing arrangements with preliminary negotiations as to the likely differences.	Multiple firm equipment quotes. Multiple material supply and construction quotes and rates checked. Mine, rail and port contracts negotiated to binding heads of agreement or near final agreements specific to the business case.	Equipment on order, tendered or firm quotes available. Tenders for Material Supply and Construction costs. Some contracts awarded. Completed and executed mine, rail and port contracts specific to the project.
A. CAPITAL COST ESTIMATES METHODOLOGY:				
A1 – Mining Costs:				
A1.1 Mineral Resource Classification	Indicated and Inferred	Indicated and Inferred	Measured, Indicated and Inferred	Measured, Indicated and Inferred
A1.2 Geotechnical Conditions	Assumed or Started	Preliminary	Defined	Detailed
A1.3 Hydrological Conditions	Assumed or Started	Preliminary	Defined	Detailed
A1.4 Site Layout	Sketch	Preliminary	Defined – Generally optimised	Complete
A1.5 Mine Design Criteria	Assumed or Started	Preliminary	Defined – Generally optimised	Defined for year 1 and Complete thereafter
A1.6 Waste Dump Design Criteria	Assumed or Started	Preliminary	Defined – Generally optimised	Defined for year 1 and Complete thereafter
A1.7 Mine Schedule	Assumed	Approximated	Optimised or Preliminary - Matched to Fleet	Defined for year 1 and Complete thereafter
A1.8 Mine Equipment	None or Assessed	Budget Priced	Calculated or Detailed	Final - Quoted Specifically
A1.9 Mine Services	Assessed	Budget Priced - sketch designed	Calculated or Detailed - full outlines	Final
A1.10 Mine Environmental Compliance	Assumed	Preliminary	Defined – Generally optimised	Complete
A1.11 Ore Reserve Classification	Not required	Probable	Payback x 1.5 Proven; Balance Probable	Payback x 1.5 Proven; balance Probable
A2 – Plant and Infrastructure Costs:				
A.2.1 Equipment Quotes	None or Factorised	Budget Priced - Single check price	Detailed - Multiple quotes	Final on Prices – firm
A.2.2 Civil / Structural	Assessed - sketched only	Budget Priced - Take-off sketch	Calculated or Detailed - MTO & multiple quotes for supply costs, benchmarked hours to install	Final -Tender or Contract Prices

KEY	**Less Than** the Minimum Standard for Class 4 Study and Estimate	**Achieved** the Minimum Standard for Class 4 Study and Estimate	**Superior to** the Minimum Standard for Class 4 Study and Estimate	
ESTIMATE CLASS	**SCOPING STUDY – PHASE 1**	**PREFEASIBILITY STUDY – PHASE 2**	**FEASIBILITY STUDY – PHASE 3 AND INVESTMENT DECISION QUALITY**	**PROJECT EXECUTION PHASE 4 – DEFINITIVE ESTIMATE**
	Class 5	**Class 4**	**Class 3**	**Class 2**
A2.3 Mechanical / Piping	Assessed - % of key equipment	Budget Priced - Mix of MTOs and factors	Calculated or Detailed - MTO & multiple quotes – Benchmarked to similar plus hours to install data. Small bore piping may be factorised.	Final - Tender or Contract Prices
A.2.4 Electrical / Instruments	Assessed - A$ per kw	Calculated for HV drives and over 100kw drives. Factorised - A$ per kw per drive, for LV and less than 100kw	Calculated - MTO & Hours with benchmarked or budget quotes	Final - estimates or Tender Prices
A2.5 Information Systems / Control Systems	Calculate as % of total direct costs	Calculate as % of total direct costs	Calculated - Mix of calculated and multiple quotes	Detailed Tender or Contract Prices
A2.6 Labour Rates	Not required	Factorised or benchmarked off best current information	Budget Priced, by contractors or equivalent and benchmarked.	Detailed or Final - tenders or Contracts Prices
A2.7 Labour Productivity	Included in general factorisation	Assessed	Calculated	Detailed - Tenders or Contracts Prices
A2.8 Construction Equipment	Not required	Factorised - A$ / Hr on Labour Rates	Calculated - A$ / Hr on Labour Rates – quoted or calculated for large cranes and special equipment costs	Detailed or Final on Quotes – Firm
A3 – Indirect Costs:				
A3.1 Temporary Facilities	Calculate as % of direct costs	Calculate as % of direct costs	Calculated	Detailed or Final - Tender or Contract Price
A3.2 Construction Support	Calculate as % of direct costs	Calculate as % of direct costs	Calculated	Detailed or Final - Tender or Contract Price
A3.3 EPCM Services	Calculate as % of direct costs	Calculate as % of direct costs, checked to benchmarks	Calculated in detail – Benchmarks used to verify	Detailed or Final - Tender or Contract Price
A4 – Owners Management Services:				
A4.1 Contingency (refer to notes in text) Basis Minimum Others	Assessed or Factorised for overall project 25% to 35% of total costs Add up to 5% for project in existing operation Add up to 5% for new or novel technology or underground projects	Calculated or Detailed - by area 15% to 25% of total costs Add up to 5% for project in existing operation Add up to 5% for new or novel technology or underground projects	Detailed - by trade and area 10% to 15% of total costs Add up to 5% for project in existing operation Add up to 5% for new or novel technology or underground projects	Final - by trade and area 5% to 10% of total costs Add up to 5% for project in existing operation Add up to 5% for new or novel technology or underground projects
A4.2 Commissioning	Calculate as % of direct costs	Calculate as % of direct costs	Calculated or Detailed	Detailed or Final based Quotes - firm
A4.3 Preproduction	Calculate as % of direct costs	Calculate as % of direct costs	Calculated or Detailed	Detailed or Final based Quotes - firm
A4.4 Corporate Costs	Calculate as % of direct costs	Calculate as % of direct costs	Calculated or Detailed	Detailed or Final based on Quotes - firm
A4.5 Provisions	Calculate as % of direct costs	Calculate as % of direct costs	Calculated or Detailed	Detailed or Final based on Quotes - firm
A4.6 Foreign Exchange	Only identify major equipment components exposed to foreign exchange	Identify equipment and commodities to be imported, basis, values and likely currency. Quantify to level 3.	Identify equipment and commodities to be imported basis, values and likely currency. Provide forecasts of changes. Quantify to Level 3.	Detailed - calculations of actuals or basis.
Refer to Section 4.3 below for basis of calculation of Working, Deferred, Sustaining Closure and Rehabilitation Costs and Residual Values.				

KEY	Less Than the Minimum Standard for Class 4 Study and Estimate	Achieved the Minimum Standard for Class 4 Study and Estimate	Superior to the Minimum Standard for Class 4 Study and Estimate	
ESTIMATE CLASS	SCOPING STUDY – PHASE 1	PREFEASIBILITY STUDY – PHASE 2	FEASIBILITY STUDY – PHASE 3 AND INVESTMENT DECISION QUALITY	PROJECT EXECUTION PHASE 4 – DEFINITIVE ESTIMATE
	Class 5	Class 4	Class 3	Class 2
B. BASIS OF DELIVERABLES AND GENERAL PROJECT DATA NEEDED TO BE AVAILABLE TO SUPPORT THE ESTIMATE CLASS:				
B1 – General Project:				
B1.1 Baseline Reports (Climate, Soils, Geotech, Hydrology, Wind, Wave, etc.)	Assumed	Preliminary	Defined or Complete	Complete
B1.2 Environment and Community Reports	Started - General Assessment	Preliminary - Focusing on constraints and issues	Defined - Specific constraints, issues and commitments declared	Complete - Management Plans Defined and Detailed
B1.3 Project Scope Description	Started	Approximate to Preliminary	Defined	Complete
B1.4 Integrated Project Execution Plan	Started	Approximate	Defined - Specific	Complete - Specific
B1.5 Contracting Strategy – Implementation	Assumed	Outlined	Defined and generally optimised	Defined and Detailed
B1.6 Project Master Schedule – Implementation	Outlined to Level 2	Preliminary (Bar chart) to Level 3 and critical path verified. Preliminary resource analysis.	Defined and resourced to Level 4 and the critical path fully detailed to activity Level 4. Resourced at Level 3 or lower.	Actual to Date, Detailed and Resourced To Go.
B1.7 Project Master Schedule – Commissioning and Ramp-up	Assumed to Level 2	Outlined to Level 3 and critical path verified	Defined to Level 4 and the critical path fully detailed to activity Level 4	Complete - Resources and critical path detailed
B1.8 Work Breakdown Structure	Outlined to Level 2	Level 3 and Preliminary to Level 4	Defined to Level 4	Defined to Levels 5 and 6
B1.9 Project Code of Accounts	None	Preliminary	Defined	Defined
B1.10 Escalation Strategy	None	Preliminary	Defined and Detailed to source currency for individual items	Defined
B1.11 Foreign Exchange Strategy	None	Preliminary	Defined	Defined
B1.12 Contingency Methodology	Assessed overall, or by areas	Approximate or Calculated by Area or Trade. Maybe based on Risk Analysis.	Detailed Calculation and Risk Analysis	Complete -Calculation on the committed and the To Go costs checked with risk analysis
B1.13 Accuracy	Assessed by Judgement	Evaluated by area and sub-areas	Detailed Analysis – Monte Carlo	Detailed Analysis – Monte Carlo
B1.14 Basis of Estimate and Methodology Statement	Outline	Preliminary	Complete	Complete
B2 – Engineering Deliverables:				
B2.1 Block Flow Diagrams	Started to Optimised	Preliminary to Complete	Complete	Complete
B2.2 Process Flow Diagrams	Assumed - Basic outline	Started to Preliminary	Preliminary to Complete	Complete
B2.3 P&ID's	Some sketches only	Started	Preliminary to Complete	Complete
B2.4 Heat & Material Balances	Started	Preliminary	Preliminary to Complete	Final
B2.5 Design Criteria	Outline	Preliminary	Preliminary to Complete	Final
B2.6 Overall Site Plan	Outline Sketch	Started	Preliminary to Complete	Final
B2.7 Plot Plans	None	Started to Preliminary	Preliminary to Complete	Final

KEY	**Less Than** the Minimum Standard for Class 4 Study and Estimate	**Achieved** the Minimum Standard for Class 4 Study and Estimate	**Superior to** the Minimum Standard for Class 4 Study and Estimate	
ESTIMATE CLASS	**SCOPING STUDY – PHASE 1**	**PREFEASIBILITY STUDY – PHASE 2**	**FEASIBILITY STUDY – PHASE 3 AND INVESTMENT DECISION QUALITY**	**PROJECT EXECUTION PHASE 4 – DEFINITIVE ESTIMATE**
	Class 5	**Class 4**	**Class 3**	**Class 2**
B2.8 Process / Mechanical Equipment List	Started / Preliminary	Started to Preliminary	Preliminary to Complete	Final
B2.9 Electrical Equipment List	None	Started to Preliminary	Preliminary to Complete	Final
B2.10 Specifications and Datasheets	None Preliminary - Possibly for some major Mechanical	Started Preliminary – for major mechanicals	Preliminary to Complete	Final
B2.11 GA Drawings by Facility / Area	None	Started and some initial Preliminary	Preliminary to Complete	Final
B2.12 Mechanical / Piping Discipline Drawings	None	Started	Preliminary to Complete - Small bore piping may only be "Started"	Complete
B2.13 Civil / Structural Discipline Drawings	None	Started	Preliminary to Complete	Complete
B2.14 Electrical Single Line Diagrams	None	Started to Optimised	Preliminary to Complete - Low Voltage Cabling and Trays may only be "Started".	Complete
B2.15 Electrical Discipline Drawings	None	Started	Started to Optimised - Low Voltage Cabling and Trays may only be "started".	Preliminary / Complete
B2.16 Instrumentation & Control Discipline Drawings	None	None	Started to Optimised - Low Voltage Cabling and Trays may only be "started".	Preliminary / Complete
B2.17 Process / System Capacity Simulations	None	Preliminary	Complete	Complete
B2.18 Communications and Data Capture Systems	None	Started to Optimised	Preliminary to Complete	Complete
B2.19 Information Systems Plan, as per PEP	None	Started	Preliminary to Complete	Complete
B2.20 Spare Parts Listings	None	Started	Optimised or Preliminary	Complete
B2.21 Environmental Management	Assumed	Preliminary	Defined	Complete
B2.22 Cash Flow	Not required	Preliminary – annual	Detailed	Updated Monthly
B2.23 Information Systems	None	Started to Preliminary	Preliminary to Complete	Complete
B2.24 Information Systems Plan, as per PEP	None	Started	Preliminary to Complete	Complete
B2.25 Spare Parts Listings	None	Started	Optimised or Preliminary	Complete
B3 – Owners Deliverables:				
B3.1 Project Execution Plans and Procedures	Assumed	Outline or Preliminary Execution Plan	Defined - Project Execution Plan	Complete – Project Execution Plan, and defined Operations Plans
B3.2 Operational Readiness Plan	Assumed	Outlined	Preliminary - included in Project Execution Plan	Defined
B3.3 Permits and Approvals	Assumed	Identified and Commenced	Essentially complete with "Headline" Approval Document and Management Plans issued	Complete

KEY	**Less Than** the Minimum Standard for Class 4 Study and Estimate	**Achieved** the Minimum Standard for Class 4 Study and Estimate	**Superior to** the Minimum Standard for Class 4 Study and Estimate	
ESTIMATE CLASS	**SCOPING STUDY – PHASE 1**	**PREFEASIBILITY STUDY – PHASE 2**	**FEASIBILITY STUDY – PHASE 3 AND INVESTMENT DECISION QUALITY**	**PROJECT EXECUTION PHASE 4 – DEFINITIVE ESTIMATE**
	Class 5	**Class 4**	**Class 3**	**Class 2**
B3.4 Baseline Environmental Conditions	Desktop review	Baselines commenced	Complete (known basis)	Complete
B3.5 HSEC Standards and Policies	Declared Policy	Declared Policy and Basis	Declared Policy and expanded to suit circumstances	Complete
B3.6 Communications and Stakeholder Liaison	Not required	Started / Preliminary	Preliminary / Complete	Complete - Ongoing status review
B3.7 Human Resources Strategy	Not required	Preliminary	Defined	Complete - Ongoing status review
B3.8 Financing Plan and Strategy	Not required	Not required	Defined - Conditions Precedent Identified	Complete
B3.9 Marketing Plan and Strategy	Not required	Broad Market assessed and particular market identified	Defined Plan and Offtake Negotiated	Complete
B3.10 Purchasing Plan and Strategy	Not required	Not required	Defined Plan	Complete
B3.11 Economic Modelling	Assumed - Rudimentary Annual Cash Flows	Optimised - Cash Flow Model Integrated with Production Scenarios	Defined - Cash Flow Model with all cash flows (including financing and taxation), plus multiple scenario analysis and simulation	Complete - Regular update and Review

1.31 Definitions and Abbreviations

Definition of Acronyms

Acronym	Expansion
A$	Australian dollars
ADL	Adelaide, South Australia
Ag	Silver
Au	Gold
AUD	Australian dollar
BEC	Breakeven copper (price)
BOO	Build, Own and Operate
BOOM	Build, Own, Operate and Maintain
CAPEX	Capital Expenditure
CASA	Civil Aviation Safety Authority
COG	Cut Off Grade
COS	Coarse Ore Stockpile
CTP	Concentrate Treatment Plant
Cu	Copper
DMT	Dry Metric Tonne
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortisation
EPC	Engineering, Procurement and Construction
FEL	Front End Loader
FS	Feasibility Study
HV	High Voltage
IRR	Internal Rate of Return
KPI	Key Performance Indicator
lb	pound
LOM	Life of Mine
NSR	Net Smelter Return
NPV	Net Present Value
OPEX	Operating Expenditure
oz	ounce
PFS	Pre-Feasibility Study
RMR	Rock Mass Rating
RO	Reverse Osmosis
ROM	Run of Mine

Acronym	Expansion
SAG	Semi-Autogenous Grinding
SLC	Sub-Level Caving
SLOP	Sub-Level Open Stoping
TSF	Tailings Storage Facility
UCS	Unconfined Compressive Strength
USD	United States dollars

Units of Measure

Abbreviation	Expansion of Unit
$	Australian dollars(s)
%	per cent
a	annum
kg	kilogram
ktpa	thousand tonnes per annum
kV	kilovolt
lb	pound
Mt	million tonnes
Mtpa	million tonnes per annum
oz	ounce
t	tonne
y	year

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OZ MINERALS