

A horizontal strip of a photograph showing a mining operation. It features a large yellow mining vehicle, possibly a haul truck, with its headlights on, operating in a dark, rocky environment. The image is partially obscured by the yellow header and the white text below.

# Carrapateena 2019 Mineral Resources and Ore Reserves Statement and Explanatory Notes

As at 30 June 2019

## Table of Contents

<b>Summary</b>	<b>4</b>
<b>Carrapateena Mineral Resources Statement as at 30 June 2019</b>	<b>5</b>
Mineral Resources.....	6
Changes in the June 2019 Mineral Resource Estimate.....	7
Geology and Geological Interpretation.....	8
Sampling and Sub-Sampling Techniques.....	8
Drilling Techniques.....	9
Sample Analysis Method.....	9
Estimation Methodology.....	9
Mineral Resource Classification Criteria .....	9
Cut-Off Value .....	10
Mining and Geotechnical .....	11
Processing .....	11
Environment .....	12
Reasonable Prospects.....	12
Dimensions .....	12
<b>JORC Code, 2012 Edition, Table 1</b>	<b>13</b>
Section 1 Sampling Techniques and Data.....	13
Section 2 Reporting of Exploration Results .....	23
Section 3 Estimation and Reporting of Mineral Resources .....	26
<b>Competent Person Declaration - Mineral Resources</b>	<b>38</b>
Competent Person Statement.....	38
<b>Carrapateena Ore Reserves Statement as at 30 June 2019</b>	<b>39</b>
Summary.....	39
<b>JORC Code, 2012 Edition, Table 1</b>	<b>43</b>
Section 4 Estimation and Reporting of Ore Reserves.....	43
<b>Competent Person Declaration - Ore Reserves</b>	<b>56</b>
Competent Person Statement.....	56

### List of Tables

Table 1: Carrapateena Mineral Resources Estimate <sup>1 2 3</sup> as at 30 June 2019 .....	4
Table 2: Carrapateena Ore Reserves Estimate <sup>1 4 5</sup> as at 30 June 2019.....	4
Table 3: Carrapateena Mineral Resource Estimate <sup>6 7 8</sup> as at 30 June 2019 .....	7
Table 4: Dimensions of the Mineral Resource .....	12
Table 5: Carrapateena Ore Reserves estimate as at 30 June 2019 .....	41

### List of Figures

Figure 1: Location of Carrapateena, South Australia .....	5
Figure 2: Cross sections (737,800mN – left, and 6,543,350mE - middle) and plan (4,500 RL) through the Resource model showing Block Classification within the Nominal A\$20 SNSR/t Cut-Off Shape for Blocks Above 3,600 RL ...	11
Figure 3: Layout of mine design at Carrapateena .....	39
Figure 4: Cross Section of cover sequence at Carrapateena, used in flow modelling.....	40

## Summary

**Table 1: Carrapateena Mineral Resources Estimate<sup>123</sup> as at 30 June 2019**

Envelope Cut-off (SNSR/t A\$)	Category	Tonnes Mt	Cu %	Au g/t	Ag g/t	Cu kt	Au koz	Ag Moz
\$20	Measured	140	0.8	0.4	3	1,200	1,650	13
	Indicated	480	0.7	0.3	3	3,200	4,400	51
	Inferred	340	0.3	0.1	2	890	1,400	19
	<b>Total</b>	<b>970</b>	<b>0.5</b>	<b>0.2</b>	<b>3</b>	<b>5,200</b>	<b>7,400</b>	<b>83</b>

**Table 2: Carrapateena Ore Reserves Estimate<sup>145</sup> as at 30 June 2019**

Category	Tonnes Mt	Cu %	Au g/t	Ag g/t	Cu kt	Au koz	Ag Moz
Proved	0	0	0	0	0	0	0
Probable	91	1.6	0.67	8	1,500	1,900	22
<b>Total</b>	<b>91</b>	<b>1.6</b>	<b>0.67</b>	<b>8</b>	<b>1,500</b>	<b>1,900</b>	<b>22</b>

1 These tables are subject to rounding errors.

2 This Mineral Resource does not account for mining recovery or mining dilution.

3 The use of a cut-off to generate a contiguous envelope required by block caving (BC) results in some blocks below cut-off being included in the Mineral Resources, as exemplified by the Inferred Resources, of which 67% of the tonnage is below the cut-off.

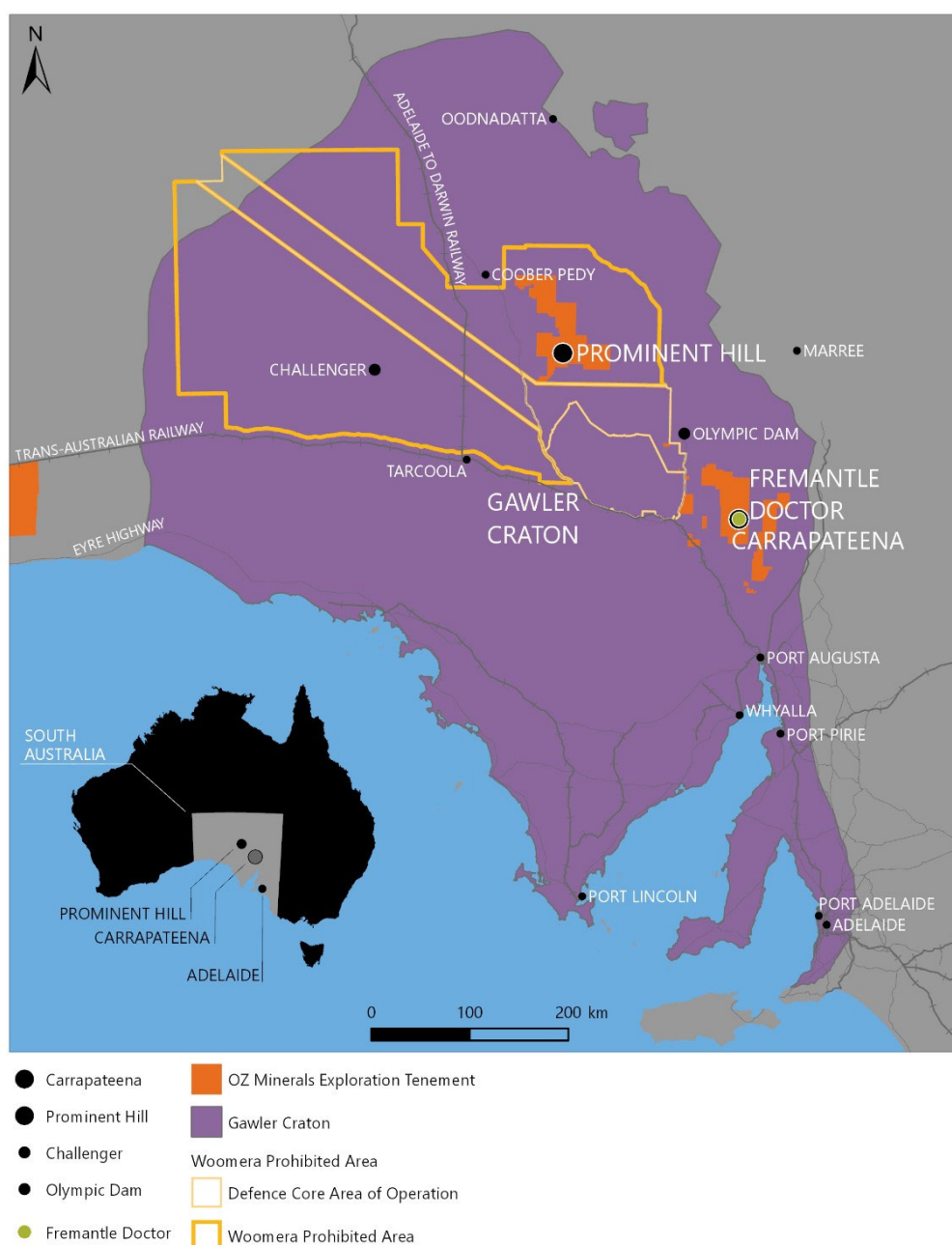
4 Inferred Resources included in this estimate as dilution material is 3.7MT @ 0.3% Cu, 0.2g/t Au, 1.9g/t Ag

5 Inferred Resources excluded in this estimate but is part of the mine plan is 0.2MT @ 0.3% Cu, 0.07 g/t Au and 2.7g/t Ag

6. Mineral Resources are inclusive of Ore Reserves. The Ore Reserves are based on Sub Level Cave Mining method based on the Scoping Study released in March 2019.

## Carrapateena Mineral Resources Statement as at 30 June 2019

The Carrapateena November 2019 Mineral Resources statement relates to an updated Mineral Resources estimate for the Carrapateena copper-gold deposit, which is an iron oxide copper-gold (IOCG) deposit located in central South Australia on the eastern margin of the Gawler Craton (see Figure 1).



**Figure 1: Location of Carrapateena, South Australia**

This Mineral Resources statement is an update to the March 2019 Mineral Resources statement as at 6 March 2019<sup>1</sup>. This update includes drillhole data acquired between 2017 and 2019 and uses a consistent approach to interpretation, as well as defines a new 'Mineralised Granite' domain. The Reasonable Prospects test uses the previous commodity prices and exchange rate, but below grades of 0.6% copper, reduced recoveries are assumed based on recent test work. The model has been created and classified assuming it will underpin an assessment of the applicability of the Block Caving (BC) mining method but is also valid for evaluating a Sub-level Caving (SLC) mining method.

## Mineral Resources

The estimated Mineral Resources for the Carrapateena deposit are shown in Table 3. The Mineral Resources estimate has been reported in accordance with the 2012 edition of the JORC Code. The Mineral Resources estimate is based on data from 137 drill holes (including 34 wedges) for a total of 71,595m of samples in mineralised domains. For mineralisation above the 3,600 RL, a nominal cut-off of A\$20 SNSR per tonne<sup>2</sup> has been used to generate a continuous shape<sup>3</sup> in which all material was deemed to have reasonable prospects of eventual economic extraction, assuming a BC operation.

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<sup>1</sup> Carrapateena Mineral Resource Statement and Explanatory Notes as at 6 March 2019.

[https://www.ozminerals.com/uploads/media/190306\\_ASX\\_Release\\_Carrapateena\\_Mineral\\_Resource\\_Statement.pdf](https://www.ozminerals.com/uploads/media/190306_ASX_Release_Carrapateena_Mineral_Resource_Statement.pdf)

<sup>2</sup> Simplified Net Smelter Return (SNSR) approximates the true NSR and details can be found under Section 3 "Cut-off parameters" in the attached JORC Table 1 documentation.

<sup>3</sup> The shape was generated by digitising a single polygon around blocks above the cut-off on 20 m levels. These polygons were then refined to ensure a 3D shape that was realistic given the BC mining option. No separate internal waste shapes were defined as the likelihood of selectively recovering such material during mining is very low in a BC operation. Minimum (maximum) planar polygon area for the BC is around 135,000 m<sup>2</sup> (370,000 m<sup>2</sup>), which equates to a circle with diameter of 410 m (685 m).

**Table 3: Carrapateena Mineral Resource Estimate<sup>6,7,8,9</sup> as at 30 June 2019**

Envelope Cut-off (SNSR/t A\$)	Category	Tonnes Mt	Cu %	Au g/t	Ag g/t	Cu kt	Au Koz	Ag Moz
\$20	Measured	140	0.8	0.4	3	1,200	1,650	13
	Indicated	480	0.7	0.3	3	3,200	4,400	51
	Inferred	340	0.3	0.1	2	890	1,400	19
	<b>Total</b>	<b>970</b>	<b>0.5</b>	<b>0.2</b>	<b>3</b>	<b>5,200</b>	<b>7,400</b>	<b>83</b>

6 This table is subject to rounding errors.

7 This Mineral Resource does not account for mining recovery or mining dilution.

8 The use of a cut-off to generate a contiguous envelope required by block caving (BC) results in some blocks below cut-off being included in the Mineral Resources, as exemplified by the Inferred Resources, of which 67% of the tonnage is below the cut-off

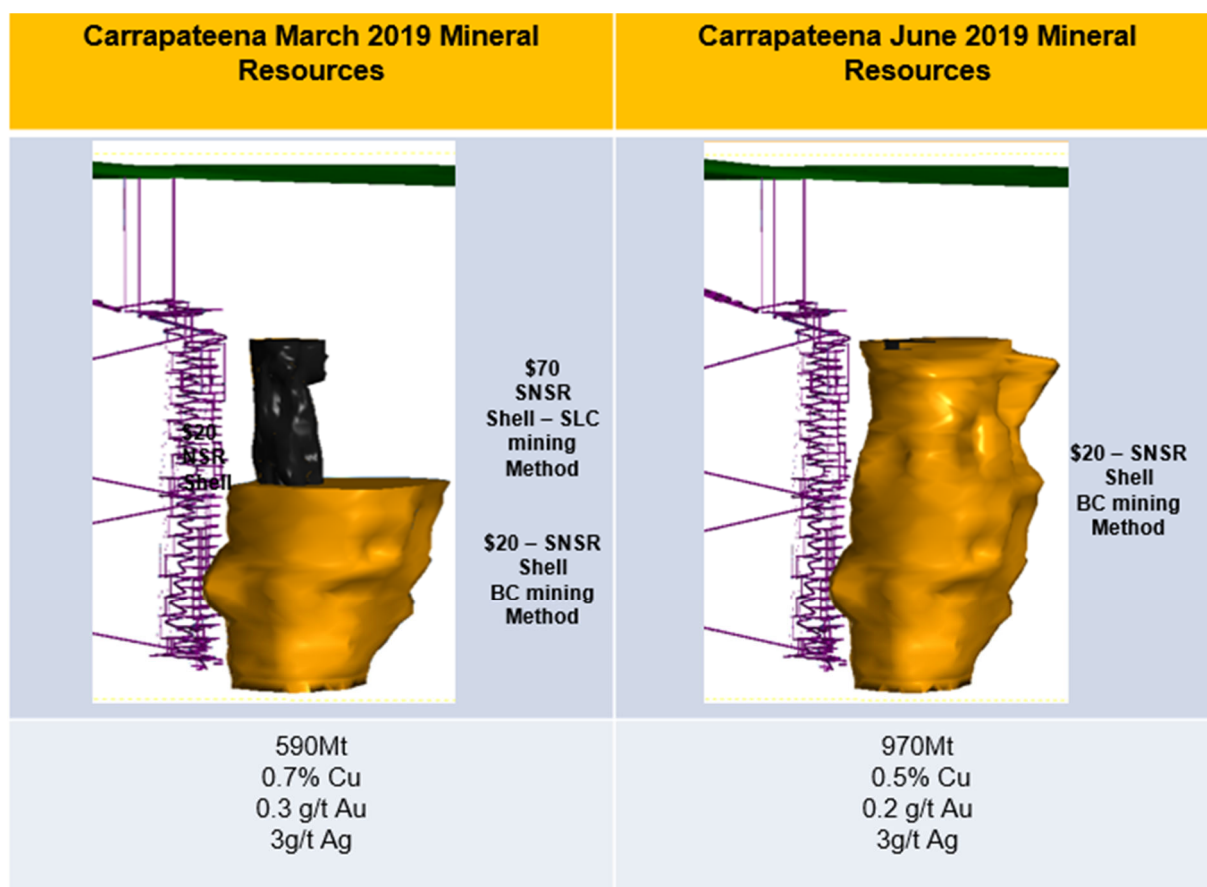
9. Mineral Resources are inclusive of Ore Reserves

## Changes in the June 2019 Mineral Resource Estimate

Increases in the Mineral Resources for Carrapateena results in a 65% increase in tonnes and a 34% increase in copper tonnes, with the inclusion of the upper half of the mineralisation assumed to be mineable using a Block Cave Mining method as shown in Figure 2.

The differences in tonnages and grades between the March 2019 Mineral Resources and the September 2019 Mineral Resource are due to:

- A change in the assumed mining method (and corresponding SNSR/t cut-off value) to BC above 4,200 RL (previously SLC);
- Additional drilling data acquired since 2016;
- Updated interpretation to accommodate new data;
- Minor refinements to estimation parameters;
- Refinements to resource classification criteria;
- Minor changes to the economic parameters for the SNSR calculation; and
- Use of VULCAN™ software instead of Micromine™ for grade estimation.



**Figure 2: Comparison of Mineral Resources reporting envelopes between the March and June 2019 Resources Statements.**

## Geology and Geological Interpretation

The Carrapateena Breccia Complex is located within the Olympic copper gold (Cu-Au) Province on the eastern edge of the Gawler Craton. It is hosted within Donington Suite granite and is unconformably overlain by approximately 480 metres of Neoproterozoic sediments. Mineralisation and alteration are in similar form found at other large South Australian IOCG deposits, including Prominent Hill and Olympic Dam.

For modelling and estimation, the deposit geology was interpreted into several domains based on a combination of lithology, chemistry and mineralisation style, including a chalcopyrite-dominant domain, bornite-dominant domain, pyrite-chalcopyrite domain, gold enriched zones, leached zones, mineralised granite domain and barren hematite breccias.

## Sampling and Sub-Sampling Techniques

All basement samples consist of diamond drill core (NQ, NQ2, HQ and PQ) cut with a manual or automatic core saw. The drill core is sampled as half core, except for PQ core, metallurgical holes and field duplicates, where quarter core was sampled.



All available basement drill core, except for metallurgical holes and some instances where holes passed through large intervals of granite outside the mineralisation, were sampled on 1 metre intervals but respect geological contacts in places. Entire samples were crushed then pulverised. For OZ Minerals drill holes, sample preparation included drying, crushing and pulverising in full to a nominal 90 percent passing 75 microns. For Teck Cominco Australia Pty Ltd (Teck) drill holes, samples were pulverised to a nominal 85 percent passing 75 microns.

## Drilling Techniques

For Teck Cominco Australia Pty Ltd drill holes, a combination of RC and mud-rotary was used for precollars. HQ diamond drilling was used through to top of basement and NQ through basement to EOH. For OZ Minerals drill holes, diamond drilling was used from surface with a combination of PQ, HQ and NQ2 core sizes.

## Sample Analysis Method

Samples were sent to either the Bureau Veritas (Amdel) Adelaide laboratory by OZ Minerals and large proportion of Teck drill holes, or the Intertek Genalysis Perth laboratory (limited Teck holes). Copper and silver were analysed using a multi-acid digest and ICP-OES (copper and silver) or ICP-MS (silver, OZ Minerals holes). Gold grades were analysed using fire assay (typically 20 grams or 40 grams) and, in nearly all cases, an AAS finish.

## Estimation Methodology

A block model was constructed having values estimated independently for Cu, Au, Ag, U, F, C, Ba, Fe, Mg, Si, S, SG (as measured) and Weight Loss on Drying, by using Ordinary Kriging of sample data composited to 4 metre intervals. Domain boundaries were generally treated as hard boundaries during estimation, except for gold, for which soft boundaries were used between some domains.

## Mineral Resource Classification Criteria

The basis for Mineral Resource classification is underpinned by the robustness of the conceptual geological model, quality of data and the continuity of geology and grade relative to the arrangement of data. OZ Minerals provided advice to the Competent Person relating to the quality of the data and the confidence in the interpretations of geology and mineralisation. The quality of the estimation of grades was assessed using the relative kriging variance, estimation pass, slope of regression, distance to the nearest informing composite and number of holes used in the copper estimate. The confidences in the interpretations and copper estimate were then integrated. Finally, those parts of the model that were unlikely to satisfy the 'reasonable prospects test' (reasonable prospects for eventual economic extraction), were excluded from the resource estimate, mainly based on contiguity, dimensions and grade. A depth cut-off of 1,500 m below surface (3,600 RL), has been applied to the A\$20 SNSR/t shape, which is based on the lowest level to be reasonably extracted by block caving given the current understanding of rock mass and stress.

The Competent Person has checked, reviewed and integrated all this information and subsequently assigned a classification of Measured, Indicated or Inferred Mineral Resource to the estimate, and excluded parts of the model that do not satisfy the 'reasonable prospects test' from the Mineral Resources.

### Cut-Off Value

The Mineral Resources are reported within a shape that has been generated using a cut-off applied to the simplified NSR per tonne (SNSR/t). The SNSR formula is:

$$\text{SNSR} = X \times \text{In situ value (ISV)}$$

where

$$X = 0.4 + \text{Cu}\%/2 \text{ where Cu} < 0.6\%, 0.7 \text{ elsewhere}$$

and

$$\text{ISV} = (\text{Cu} \% \div 100\% \times 2,204\text{lb/t} \times \text{USD}2.96/\text{lb} + \text{Au g/t} \div 31.1\text{g/oz} \times \text{USD}1,305/\text{oz} + \text{Ag g/t} \div 31.1\text{g/oz} \times \text{USD}18.8/\text{oz}) \div 0.73\text{USD/AUD}.$$

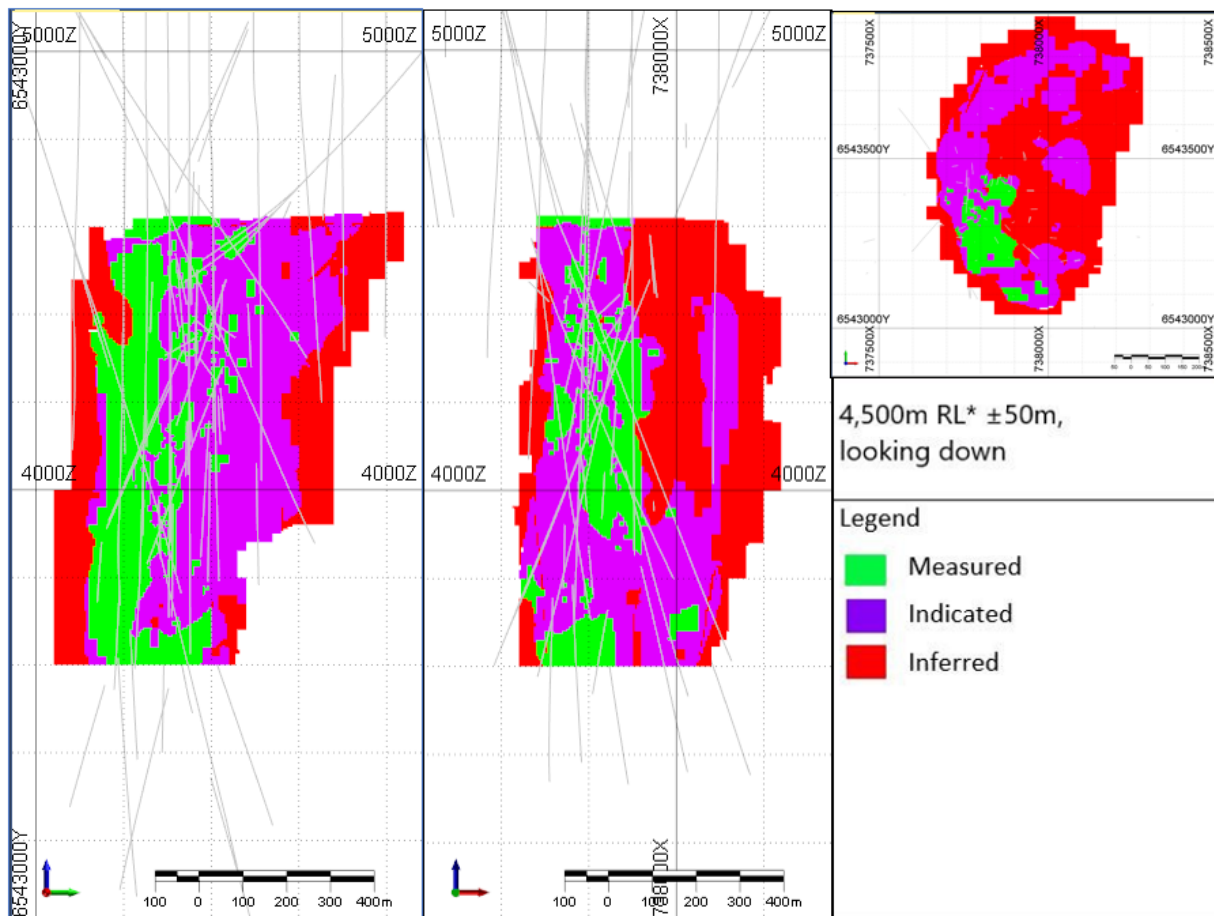
The assumed commodity prices and exchange rate comes from OZ Mineral's long-term forecasts.

In the March 2019 update the X coefficient was a constant 0.7 but has been reduced for lower Cu grade blocks to reflect lower metallurgical recoveries of Cu and Au as suggested by recent test work. Average metallurgical recoveries are approximately 84% (Cu), 60% (Au) and 60% (Ag).

The difference between using the simplified formula above and a more detailed NSR formula, which accounts for variable recoveries and penalties on a block-by-block basis, was not considered to be significant for the purposes of this Mineral Resource estimate.

The Mineral Resource is reported within a 'reasonable prospects' shape that has been generated using a cut-off SNSR of A\$20 per tonne, being the expected combined mining, milling and GA costs excluding sustaining capital assuming mineralisation is amenable to mining by BC. No cut-off has been applied to Mineral Resources inside the A\$20 SNSR per tonne cut-off shape.

The shape was generated by digitising a single polygon around blocks above the cut-off on 20 m levels. These polygons were then refined to ensure a 3D shape that was realistic given the proposed mining option. To achieve this, in places some blocks below the cut-off were included. No separate internal waste shapes were defined as the likelihood of selectively recovering such material during mining is very low in a BC operation. Minimum and maximum planar polygon areas for the BC are around 135,000 m<sup>2</sup> and 370,000 m<sup>2</sup> respectively, which equate to circles with diameters of 410 m and 685 m respectively.



\* Australian Height Datum = 5000m RL. The topographic surface above the Mineral Resource is approximately 5100m RL.

**Figure 3: Cross sections (737,800mN – left, and 6,543,350mE - middle) and plan (4,500 RL) through the Resource model showing Block Classification within the Nominal A\$20 SNSR/t Cut-Off Shape for Blocks Above 3,600 RL**

## Mining and Geotechnical

Carrapateena has a high-grade core of bornite and chalcopyrite-rich mineralisation, surrounded by a pyrite-chalcopyrite zone that is considered amenable to mining by BC. For the purpose of this statement, it is assumed that BC will be a suitable method for extraction of the mineralisation. This Mineral Resource does not account for mining recovery, however the nature of the 'reasonable prospects' shape, and the reporting of all material within it regardless of SNSR/t, means that considerable dilution is already accounted for in the Resource estimate.

## Processing

Metallurgical test work studies on representative samples selected via a geometallurgical study have shown that a conventional crushing, grinding and flotation circuit would produce acceptable concentrate grades and metal recoveries.

### Environment

The Carrapateena deposit is located on Mineral Lease 6471. This lease has an approved Program for Environmental Protection and Rehabilitation (PEPR) as required under the South Australian Government *Mining Act 1971* (SA) and is in good standing.

### Reasonable Prospects

- The budgeted mining method is sub level caving (SLC), however block caving (BC) is being investigated through scoping studies and desktop studies through the whole province.
- The 2019 Scoping Study was released outlining a block cave on the 3,700 RL joining the SLC at approximately the 4,200 RL.
- A desktop study in 2019 identified additional resources outside the current SLC shape above the 4,200 RL that are amenable to block cave mining.
- The reasonable prospects shape above 3,600 RL up to the 4,600 RL was generated based on a cut-off SNSR of A\$20 per tonne assuming mining by BC.
- Given the likely mining method, the classification also accounts for the expected contiguity of material above cut-off.
- Metallurgical test work indicates that a saleable concentrate can be produced.
- Reporting of the Resources has been limited to above 1,500 metres below surface (3,600 RL) as mineralisation below 3,600 RL this is the lowest level to be reasonably extracted by block caving method based on the current understanding of rock mass and stress.
- Material outside of any SLC but within the BC shape is assumed to satisfy the reasonable prospects test. Further mining studies will identify how much of the halo around any SLC may not be recoverable by a BC.

### Dimensions

The deposit geometry is generally pipe-like, with the lateral extent reducing with depth. Limits of the Mineral Resource are listed in Table 4.

**Table 4: Dimensions of the Mineral Resource**

Dimension	Minimum	Maximum	Extent (m)
Easting	737,600	738,300	700
Northing	6,543,000	6,543,940	940
RL	3,600	4,620	1,020

## JORC Code, 2012 Edition, Table 1

### Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li><i>Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i></li> <li><i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i></li> <li><i>Aspects of the determination of mineralisation that are Material to the Public Report.</i></li> <li><i>In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.</i></li> </ul>	<p>All basement samples consist of diamond drill core (NQ, NQ2, HQ and PQ) cut with a manual or automatic core saw. The drill core is sampled as half core, except for PQ core, metallurgical holes and field duplicates, where quarter core was sampled. The method of sampling is considered acceptable for the estimation of Mineral Resources.</p> <p>All available basement drill core prior to 2016 was sampled.</p> <p>Where 2016 resource drill holes intersected large intervals of basement granite distal to the mineralisation zone, drill core was sampled at one metre intervals every second metre. All other available basement drill core from 2016 resource drilling was sampled.</p> <p>2018/19 resource drill holes were sampled when in basement.</p> <p>Sampling interval is generally 1m but respects geological contacts in places.</p> <p>Entire samples were crushed then pulverised to a nominal 90% passing 75 microns. The resulting pulps were analysed using a variety of methods which included multi acid digest with ICP-OES determination for copper and fire assay with AAS for gold (40g or 20g charge). Sub-sampling, sample preparation, assay methods and assay quality are discussed in other parts of this table.</p>

Criteria	JORC Code explanation	Commentary
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</li> </ul>	<p>For Teck Cominco Australia Pty Ltd (Teck) drill holes, a combination of RC and mud-rotary was used for pre-collars. HQ diamond drilling was used through to top of basement and NQ through basement to EOH. For OZ Minerals drill holes, diamond drilling was used from surface with a combination of PQ, HQ and NQ2 core sizes.</p> <p>70% of Teck drill holes were vertical to sub-vertical, 2 holes were angled (nonvertical) from surface, and 13 holes were wedged off a sub-vertical parent hole. All OZ Minerals drill holes were angled from surface. For angled and wedge holes, core was orientated using an ACE, ACT or Coretell core orientation tool.</p>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</li> </ul>	<p>Length based core recovery is measured from reassembled core for every drill run. The data were recorded in a SQL Server database via a GBIS front end. Average core recovery was high with more than 99% recovered through the mineralised zone.</p> <p>The style of mineralisation and drilling methods employed lead to very high sample recovery, so no further effort was considered necessary to increase core recovery.</p> <p>There is no significant relationship between sample recovery and grade. The very high core recovery means that any effect of such losses would be negligible if such a relationship even existed.</p>
<b>Logging</b>	<ul style="list-style-type: none"> <li>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</li> <li>The total length and percentage of the relevant intersections</li> </ul>	<p>Core samples were geologically logged by geologists and geotechnically logged by geologists (Teck drill holes) or geotechnical personnel (OZ Minerals drill holes). Logging is considered to have appropriate detail to support Mineral Resource estimation, mining studies and metallurgical studies.</p>

Criteria	JORC Code explanation	Commentary
	<i>logged.</i>	<p>Core logs were qualitative and quantitative in nature. Lithology and alteration were logged qualitatively; mineralisation, structure and geotechnical data were logged quantitatively. Core was photographed both dry and wet after metre marking and orientation.</p> <p>All core in the mineralised zone (71,594.7m, 100 percent) was logged. This included 3,602m of core from metallurgical drill holes that was used to guide the geological interpretation but not used in the grade estimation.</p>
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li><i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></li> <li><i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></li> <li><i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></li> <li><i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i></li> <li><i>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</i></li> <li><i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></li> </ul>	<p>All sampled core was cut with an automatic or manual core saw in a consistent way that preserved the bottom of hole reference line, where present. Half core was used for normal samples, quarter core for field duplicates and for three metallurgical drill holes. Samples were mostly 1m in length, but also ranged from 0.5m to 1.5m if adjusted to geological or major alteration boundaries.</p> <p>Only core samples were used in basement.</p> <p>Sample preparation included drying, crushing, and pulverising in full to a nominal 90 percent (OZ) or 85 percent (Teck) passing 75 microns. This is considered industry standard for this style of mineralisation.</p> <p>For OZ Minerals drill holes, controlled copies of SOPs (Standard Operating Procedures) and signoffs exist for all sampling steps, all staff were adequately trained in these. Checks were made by geologists on sampling prior to loading data into database.</p> <p>Sample representivity was confirmed by results from field duplicates, lab coarse crush, and pulp duplicates every 50 samples. Sizing data was collected for OZ Minerals holes for one in every 40 pulverised samples by the laboratory analysing the samples. Analysis of these results indicated that the sampling was representative.</p>



Criteria	JORC Code explanation	Commentary
		Analysis of duplicate data at a variety of scales, from quarter core to crushed core to pulp duplicates, indicated the sample sizes were appropriate to the grain size of the material being sampled.
<b>Quality of assay data and laboratory tests</b>	<ul style="list-style-type: none"> <li><i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></li> <li><i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i></li> <li><i>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i></li> </ul>	<p>OZ Minerals received data quality reports and data for Teck drill holes, including Certified Standards, which indicated the raw data were suitable as a basis for Mineral Resource estimation. Samples sent to Bureau Veritas' (Amdel) Adelaide Laboratory by Teck had copper and silver grades determined by IC3E (ICP-OES), with 'high grade' copper (&gt; 1%) undergoing reanalysis by MET1 (ICP-OES). Gold grades were determined via FA2 (Fire Assay, 20g, AAS). Samples sent by Teck to Genalysis in Perth had copper grades determined by four acid digest and ICPOES, with 'high grade' analysis (Cu &gt; 1%) determined by modified four acid digest and ICP-OES. Gold at Genalysis was determined by Fire Assay finished by flame AAS. Uranium was analysed using lithium metaborate fusion (Bureau Veritas, Adelaide) or sodium peroxide fusion (Genalysis, Perth) followed by ICPMS.</p> <p>For OZ Minerals drill holes, copper grades were determined using a modified aqua regia digest with ICP-OES determination at Bureau Veritas Adelaide Laboratory. Gold grades were determined by 40g Fire Assay finished by AAS at Bureau Veritas Adelaide Laboratory (Amdel).</p> <p>For both Teck and OZ Minerals assay results, the techniques are total for all relevant elements except for sulphur (Teck, ICP-OES) which is near-total.</p> <p>For Teck drill holes, assay data quality was determined through submission of field and laboratory standards, blanks and repeats which were inserted at a nominal rate of 1 each per 20 drill samples.</p>



Criteria	JORC Code explanation	Commentary
		<p>For OZ Minerals drill holes, assay data quality was monitored through submission of standards and blanks every 25 samples, quarter core field duplicates and lab coarse crush and pulp duplicates every 50 samples. Analysis of results from these samples showed that levels of bias, precision and contamination are within limits that are considered acceptable.</p> <p>Teck sent a selection of coarse rejects and pulps to an umpire laboratory for analysis. Comparison of results between laboratories did not reveal any significant problems. OZ Minerals submitted two batches of check assays each to two umpire laboratories. Comparison of the results between laboratories did not reveal any significant problems. Quarterly QAQC reports commenced from the June 2012 quarter.</p> <p>Minor differences exist in the accuracy and precision of data between drilling campaigns (Teck using Amdel, Teck using Genalysis, OZ Minerals using Bureau Veritas Amdel), but the differences are not considered to be significant, and the results acceptable.</p>
<b>Verification of sampling and assaying</b>	<ul style="list-style-type: none"> <li><i>The verification of significant intersections by either independent or alternative company personnel.</i></li> <li><i>The use of twinned holes.</i></li> <li><i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></li> <li><i>Discuss any adjustment to assay data.</i></li> </ul>	<p>Documented verification of significant intervals by independent personnel has not been done, however the mineralisation appears to be reasonably continuous and is not dominated by any one significant intersection. Furthermore, the tenor of copper is visually predictable. The assay data for all Teck drill holes were imported from source lab text files into the OZ Minerals database by an external company (Expedio), and the results were compared with the database supplied by Teck.</p>

Criteria	JORC Code explanation	Commentary
		<p>Several drill holes were wedged providing close-spaced data from which short scale variability was assessed. OZ Minerals drilled several holes around Teck drill hole CAR050 to confirm grade and geological continuity. Two pairs of twin holes were drilled through the Mineral Resource for metallurgical testing. A review of data from these holes reveals very strong correlation of geology and grades.</p> <p>Primary data is stored both in its source electronic form, and, where applicable, on paper. Assay data is retained in both the original certificate (.pdf) form, where available, and the text files received from the laboratory. Data entry, validation and storage are discussed in the section on database integrity below.</p> <p>Where assay results are below detection limit, a value of half the detection limit has been used. No other adjustments were made to assay data used in this estimate.</p>
<b>Location of data points</b>	<ul style="list-style-type: none"> <li><i>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i></li> <li><i>Specification of the grid system used.</i></li> <li><i>Quality and adequacy of topographic control.</i></li> </ul>	<p>All collar locations for drill holes prior to 2016 were determined by DGPS. Collar locations for the four 2016 parent drill holes were determined by Garmin 62S Handheld GPS. The locations have been cross checked using DGPS and are within an error of <math>\pm 9\text{m}</math>, but the Handheld GPS values are still used. The impact of this error is negligible given the scale of the deposit. All collar locations after 2016 were determined by DGPS.</p> <p>Teck drill holes had downhole surveys (about every 30m) by multiple methods including Ranger Multi-Shot survey tool, Wellnav SRG (surface recording gyro) and Eastman Camera surveys.</p>

Criteria	JORC Code explanation	Commentary
		<p>For OZ Minerals drill holes up to 2017, magnetic downhole surveys were taken at nominal 30m intervals using digital Reflex EZ-Trac equipment. Completed holes were gyro surveyed using a conventional Reflex Gyro E537 tool. An APS GPS-based system was used to determine the reference azimuth at the collar. Due to difficulties with establishing the collar reference azimuth, some OZ Minerals holes use as a reference azimuth a calculated "best-fit" with EZ-Trac (magnetic) surveys in non-magnetic ground in the cover sequence. To minimise the effect of drift of azimuth measurements with the conventional gyro, an average of multiple runs was normally used, generally two runs up to June 2012, and four runs from that date onwards. Some holes were surveyed by Surtron Pty Ltd and/or ABIM Solutions Pty Ltd using a north-seeking gyroscope.</p> <p>2018 and 2019 drill programs used a north seeking gyro, a combination of continuous surveys and single surveys at 30m spacings was utilised across the program. The survey tool was an Axis Champ Gyro.</p> <p>The grid is MGA94 zone 53. Local elevations have been used, where 5000mRL is equal to Australian Height Datum.</p> <p>A DTM was flown for Teck in 2007, and over an expanded area for OZ Minerals in April 2012. The 2012 DTM was consistent (<math>\pm 1.6\text{m}</math> maximum) with the DGPS collar pickups for drill holes affecting the Mineral Resource.</p>
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li><i>Data spacing for reporting of Exploration Results.</i></li> <li><i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</i></li> <li><i>Whether sample compositing has been applied.</i></li> </ul>	No Exploration Results are reported in this statement.

Criteria	JORC Code explanation	Commentary
		<p>Drill testing the spatial extent of the prospect started with a 200-metre x 200 metre grid sequence, with 100 metre x 100 metre infill drilling commencing in September 2006. Two infill holes with four additional wedges were drilled to 50 metre spacing (north south) in the bornite zone in the south west of the deposit. After late 2011, OZ Minerals drilled non-vertical holes with the intention of better defining the limits of the copper mineralised zones. The holes were drilled in a variety of directions and so the spacing between holes was not uniform. The spacing is typically less than 50 metres in the upper part of the Measured and Indicated parts of the Mineral Resource, becoming wider at depths below 3,800mRL and in the Inferred part of the Mineral Resource.</p> <p>The data spacing and distribution is considered enough to establish geological and grade continuity appropriate for the Mineral Resource estimation and classification.</p> <p>Compositing of sample data to 4m lengths is discussed in Estimation and modelling techniques, below. No physical compositing of samples has occurred.</p>
<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li><i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i></li> <li><i>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</i></li> </ul>	<p>The Hematite Breccia that hosts the mineralisation is generally massive (at the scale of interest) with little internal structure. The deposit is interpreted as steep on the south and west sides.</p> <p>The edges of the main high-grade zone constituting the Measured and Indicated parts of the Mineral Resource are now reasonably well defined in the upper part of the deposit. The original Teck drilling was mostly vertical, but OZ Minerals' drilling has included vertical, sub-vertical and moderately dipping holes.</p>

Criteria	JORC Code explanation	Commentary
<b>Sample security</b>	<ul style="list-style-type: none"> <li><i>The measures taken to ensure sample security.</i></li> </ul>	<p>Samples were transported from site to the laboratories by road. For OZ Minerals drill holes, despatches listing samples were sent electronically to the laboratory. Any discrepancy between listed and received samples was communicated back to site staff for resolution.</p>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li><i>The results of any audits or reviews of sampling techniques and data.</i></li> </ul>	<p>An internal audit of Teck's Carrapateena database was conducted in 2008. This study identified a significant proportion (9 percent) of failed QA/QC samples in the Teck database at that time. During 2007 and 2008, a total of 9,007 samples, including QA/QC samples, coarse rejects and quarter core from an entire hole (CAR051W1) were sent to an umpire laboratory (Genalysis, Perth) for reanalysis. Minor contamination issues were concluded to have affected Amdel results but were not deemed to have a significant impact on the data.</p> <p>An external audit of Bureau Veritas Amdel Adelaide was undertaken by ioGlobal in October 2012. OZ Minerals geologists conducted three inspections of Bureau Veritas Amdel Adelaide during the 2011 to 2013 drilling campaign. Minor issues were noted on both the audit and inspections but were not considered to be material overall.</p>

Criteria	JORC Code explanation	Commentary
		<p>AMC Consultants Pty Ltd undertook a review of the data collection and sampling procedures during an audit of the Mineral Resource estimate between 30 September and 3 October 2013. AMC formed the view that the data collection procedures were industry standard practice, with the exception of the monitoring of the quality control samples, which did not appear to be being undertaken on a batch by batch and continuous basis. OZ Minerals accepts AMC's view, but does not believe that this issue has had a material effect on the quality of the data, as the systematic monitoring of quality control samples occurred on a periodic basis prior to modelling in any case.</p> <p>Data from the 2016 drilling campaign has not been subject to external audit or review, but OZ has conducted internal checks, which have not revealed any material issues.</p>

## Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</li> <li>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</li> </ul>	The Carrapateena deposit is located on Mineral Lease 6471 which expires in January 2039. This lease has an approved Program for Environmental Protection and Rehabilitation (PEPR) for the Sub-Level Cave Operation as required under the South Australian Government Mining Act 1971 (SA) and is in good standing.
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	The Carrapateena deposit was discovered in 2005 by RMG Services Pty Ltd. The approximate lateral extent of the mineralised zone was defined by drilling carried out during 2006-2008 by a joint venture between RMG Services Pty Ltd and Teck Cominco Australia Pty Ltd. The project was acquired by OZ Minerals in 2011.
<b>Geology</b>	<ul style="list-style-type: none"> <li>Deposit type, geological setting and style of mineralisation.</li> </ul>	The Carrapateena Breccia Complex is located within the Olympic copper gold (Cu-Au) Province on the eastern edge of the Gawler Craton. It is hosted within Donington Suite granite and is unconformably overlain by approximately 480m of Neoproterozoic sediments. Mineralisation and alteration are in the form of that seen at other large South Australian iron oxide copper gold (IOCG) deposits including Prominent Hill and Olympic Dam.
<b>Drill hole Information</b>	<ul style="list-style-type: none"> <li>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: <ul style="list-style-type: none"> <li>easting and northing of the drill hole collar</li> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> </ul> </li> </ul>	No Exploration Results have been reported in this release, therefore there is no drill hole information to report. This criterion is not relevant to this report on Mineral Resources.

Criteria	JORC Code explanation	Commentary
	<ul style="list-style-type: none"> <li>• down hole length and interception depth</li> <li>• hole length.</li> <li>• If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</li> </ul>	
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>• Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</li> <li>• The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	No Exploration Results have been reported in this release, therefore there are no drill hole intercepts to report. This criterion is not relevant to this report on Mineral Resources.
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>• These relationships are particularly important in the reporting of Exploration Results.</li> <li>• If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</li> <li>• If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').</li> </ul>	No Exploration Results have been reported in this release, therefore there are no drill hole intercepts to report. This criterion is not relevant to this report on Mineral Resources.
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</li> </ul>	No Exploration Results have been reported in this release, therefore no exploration diagrams have been produced. This criterion is not relevant to this report on Mineral Resources.



Criteria	JORC Code explanation	Commentary
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</li> </ul>	No Exploration Results have been reported in this release. This criterion is not relevant to this report on Mineral Resources.
<b>Other substantive exploration data</b>	<ul style="list-style-type: none"> <li>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</li> </ul>	No Exploration Results have been reported in this release. This criterion is not relevant to this report on Mineral Resources.
<b>Further work</b>	<ul style="list-style-type: none"> <li>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	The company is currently undertaking a prefeasibility study (PFS) assuming a Block Cave (BC) mining method. Further resource definition work will be planned based on the outcomes of this study.

### Section 3 Estimation and Reporting of Mineral Resources

Criteria	JORC Code explanation	Commentary
<b>Database integrity</b>	<ul style="list-style-type: none"> <li>Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</li> <li>Data validation procedures used.</li> </ul>	<p>Data is stored in a SQL Server database and is entered via a Geobank front end. Assay data were loaded from text files supplied by the laboratory directly into the database without manual transcription. Core logging for OZ Minerals holes was directly into the database using Toughbooks. Weight measurements for density were keyed into the database up to 16 March 2012, and then automated data capture was used from that date onwards. Core length measurements for recovery were made on paper prior to entry into the GBIS database. Whenever records are added or modified, the database records the time, date and the identity of the user entering or changing the data. Different user profiles and security settings exist to minimise the possibility of inadvertent modification of data.</p> <p>Lookup codes are used to ensure consistency of the way data are recorded and for referential maintaining integrity of the database. Assay and density data were reviewed visually for reasonableness and through using statistical plots. Outliers identified were investigated and corrected as required. The Teck historical data loaded from source laboratory files was compared with the database handed over by Teck.</p>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	<p>The Competent Person has visited the Carrapateena site a total of eleven times since OZ Minerals acquired the Project. The Competent Person found the protocols and practices relating to all stages of resource definition to be acceptable. The Competent Person did not find any issues that would materially affect the Mineral Resource estimate.</p>

Criteria	JORC Code explanation	Commentary
<b>Geological interpretation</b>	<ul style="list-style-type: none"> <li><i>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</i></li> <li><i>Nature of the data used and of any assumptions made.</i></li> <li><i>The effect, if any, of alternative interpretations on Mineral Resource estimation.</i></li> <li><i>The use of geology in guiding and controlling Mineral Resource estimation.</i></li> <li><i>The factors affecting continuity both of grade and geology.</i></li> </ul>	<p>Confidence in the geological interpretation varies locally and is dependent on the spacing of drilling as well as the continuity of mineralisation, both of which vary throughout the deposit. At deposit scale, the hematite breccia zone appears to be quite continuous, but its limits at depth are not yet well-defined. A subset of the hematite breccia zone contains significant copper mineralisation. Bornite-dominant and chalcopyrite-dominant zones appear as distinct clusters on scatter plots of copper and sulphur grades. The interpreted high copper grade domains were constructed using a combination of copper grade, ratio of Cu: S (adjusted for the assumed presence of sulphur in barite), and visual logs of lithology and mineralisation. Delimiting grade criteria for the chalcopyrite-dominant zone were typically copper exceeding 1.5% and Cu: S between 0.8 and 1.25. Bornite-dominant mineralisation generally had Cu: S exceeding 1.25. Copper in the bornite-dominant zone was usually more than 1.5% copper but locally some zones having lower copper grades than these were included in this domain. Chalcopyrite-dominant zones are often but not always adjacent to zones of bornite mineralisation. Confidence in the boundaries and continuity of the bornite dominant and chalcopyrite-dominant high copper grade domains are commensurate with their classification. The mostly low-grade mineralisation in the north, east, and at depth, is less continuous and has consequently been classified mainly as Inferred. Confidence decreases with depth as the distances between drill holes becomes wider. Both the hematite breccia zone and the copper-mineralised zones are open at depth.</p>

Criteria	JORC Code explanation	Commentary
		<p>The geological interpretation was based on drill core data, including geochemical data, and core logs and photos. Core logs, photos and, where appropriate, assays from metallurgical holes were also used to guide the interpretation. The geological model is interpreted to be a near-vertical body of hematite dominated breccia hosted within altered granite. Holes drilled by Teck up to 2008 were mostly sub-vertical, and these have in some cases been assumed to be near-parallel to geological and mineralisation boundaries. This interpretation has mostly been confirmed by drilling by OZ Minerals Limited since 2011 using angled drill holes. It has been assumed that near-vertical boundaries continue at depth where there is limited data. Alternative, plausible interpretations in the upper part of the deposit may have a moderate effect on estimated grades at a local scale.</p> <p>Copper sulphide mineralisation is mostly hosted in a hematite breccia zone within altered granite. The deposit is overlain by mostly unmineralised sediments. There is evidence of a leached zone lacking copper mineralisation at the top of the hematite breccia zone immediately below the unmineralised sediments. The Mineral Resource is restricted to mineralisation hosted in the hematite breccia zone.</p> <p>Copper grades are generally highest where bornite is the dominant copper sulphide, although there is also a high-grade chalcopyrite dominant zone. Chlorite alteration is present in some parts of the deposit. Where chlorite is abundant, copper and gold grades are generally low. Continuity of zones of chlorite alteration can be quite variable and zones with abundant chlorite have not been modelled separately. Dykes are present within the hematite breccia zone and in the granite, but they are not necessarily barren of copper and are not considered to have a significant effect on the estimated Mineral Resource. Gold-only mineralisation is</p>

Criteria	JORC Code explanation	Commentary
		present in some parts of the hematite zone where only trace concentrations of copper are present. Copper mineralisation is generally accompanied by gold mineralisation, although gold grades vary.
<b>Dimensions</b>	<ul style="list-style-type: none"> <li><i>The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.</i></li> </ul>	The maximum extents of the Mineral Resource inside the A\$20 SNSR/t cut-off shape are 700 metres (X) x 940 metres (Y) x 1,020 metres (Z). The deposit geometry is generally pipe-like with the lateral extent decreasing with depth. The topographic surface over the mineralisation is at approximately 5,100 RL. The depths from surface to the upper and lower limits of the Mineral Resource are approximately 480m and 1,600m respectively.

<b>Estimation and modelling techniques</b>	<ul style="list-style-type: none"> <li>• <i>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.</i></li> <li>• <i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</i></li> <li>• <i>The assumptions made regarding recovery of by-products.</i></li> <li>• <i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).</i></li> <li>• <i>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</i></li> <li>• <i>Any assumptions behind modelling of selective mining units.</i></li> <li>• <i>Any assumptions about correlation between variables.</i></li> <li>• <i>Description of how the geological interpretation was used to control the resource estimates.</i></li> <li>• <i>Discussion of basis for using or not using grade cutting or capping.</i></li> <li>• <i>The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.</i></li> </ul>	<p>Domain definition and interpretation used assay and geology data, considering the characteristics of the breccia, mineralogy of copper and iron, and copper and iron grades. This resulted in distinct and large pyrite-chalcopyrite, chalcopyrite and bornite dominant domains hosting the majority of mineralisation, with several minor domains, including a gold enriched domain, hosting the remainder. Other domains including the surrounding granite, dykes and cover sequence do not host significant copper or gold mineralisation. A sub-blocked model was used, having a parent block size of 20×20×20 metres in all domains except for granite (which used 40 x 40 x 40 metres), with sub-blocks down to 5×5×5m to honour domain boundaries. Grades and densities were estimated by Ordinary Kriging (OK) on the basis that the spatial distributions were generally diffusive and exhibited a similar level of continuity at all thresholds within the domains, as well the intended purpose of the model in which over-smoothing is not critical. Although there are some moderate correlations between variables they have been estimated independently as most samples have the full assay suite. Sample data were composited to 4m for all variables. Hard boundaries were used between most domains except for gold and secondary (non-revenue) variables, in which some boundaries were treated as soft. Analyses of boundary assumptions revealed minimal sensitivity. Outlier grades were capped to around the 99<sup>th</sup> percentile to prevent over-projection but the impact of doing this was negligible. Parent cell estimation was employed. Up to two search and estimation passes were used, with a third pass being used to assign default values to the negligible amount of unestimated blocks remaining after the second pass. The first (second) pass used search radii equivalent to 100% (200%) of the modelled variogram ranges. For the bornite-dominant and chalcopyrite dominant zones, the first pass search radii were 260m x 200m x 140m and 120m x 96m x 72m</p>
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Criteria	JORC Code explanation	Commentary
		<p>respectively. The first pass used a minimum of 4 composites and a maximum of 20 samples, with a maximum of 15 composites per drillhole. The second pass did not have search restrictions and used the same minimum and maximum composites as pass 1. The third pass assigned a grade near to the median composite grade for the relevant domain to unestimated blocks. Less than 0.1% of the blocks included in the Mineral Resource had a copper grade assigned during the third pass.</p> <p>The maximum distance from any block within the Mineral Resource to the closest composite used for the estimation of the copper grade of that block is 215m.</p> <p>Sample spacing varies widely. In the vertical direction, composites are spaced at 4 metres downhole. In the horizontal plane, the spacing between holes is not uniform. In the higher-grade core of the deposit, the spacing is less than around 30x30m locally, but generally targeted to 50x50 metres, increasing to ~100x100 metres outwards from here. Since holes have been angled to obtain information on lateral controls, the horizontal spacing varies. Given the likely mining methods (BC and SLC) the chosen block size chosen does not imply a selective mining unit size.</p> <p>Estimates were visually validated in 3D including that all blocks are filled, block grades match composite grades, artefacts are not excessive given the search parameters, and visual assessment of relative degree of smoothing.</p> <p>Statistical validation included: comparison of input versus output grades globally; semi-local checks using swath plots to check for reproduction of grade trends; comparison of global grade tonnage curve of estimates against grade tonnage curves derived from the previous estimate.</p>

Criteria	JORC Code explanation	Commentary
		<p>A check estimate using Inverse Distance Weighting (IDW) was undertaken and showed insignificant differences to the OK based estimate. The latest model does not vary significantly from the previous model (March 2019).</p> <p>Estimation was undertaken in VULCAN™ software.</p> <p>As at June 2019 no significant production had occurred at Carrapateena.</p> <p>The current assumption is that revenue will only be obtained from copper, gold and silver.</p>
<b>Moisture</b>	<ul style="list-style-type: none"> <li><i>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</i></li> </ul>	<p>Tonnages are estimated on a dry basis. Received and dried sample weight measurements were taken at the Bureau Veritas (Amdel) Adelaide laboratory for OZ Minerals drill holes. The percentage difference (weight loss on drying) has been treated as a separate variable for estimation. The dry density from which tonnages were estimated was calculated for each block after correcting for the estimated weight loss on drying. Weight loss on drying averaged 0.3%.</p>
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li><i>The basis of the adopted cut-off grade(s) or quality parameters applied.</i></li> </ul>	<p>A shape generated using a cut-off simplified NSR (net smelter return) of A\$20/t has been used for the reported Mineral Resource, assuming mining with BC. The value of \$A20/t was recommended by OZ Minerals' mining engineers as the value which covers expected mining, processing and site G&amp;A costs, while still maintaining acceptable continuity of mineralisation above cut-off.</p> <p>The formula that has been used for the simplified NSR calculation is:</p> $\text{SNSR} = X \times \text{In situ value (ISV)}$ <p>where X =</p> <ul style="list-style-type: none"> <li>0.4 + 0.5* Cu% for Cu% &lt; 0.6</li> <li>0.7 for Cu% ≥ 0.6%</li> </ul>



Criteria	JORC Code explanation	Commentary															
		<p>and</p> <ul style="list-style-type: none"> <li> <math display="block">\text{ISV} = (\text{Cu \%} \div 100\% \times 2204\text{lb/t} \times \text{USD}2.96/\text{lb} + \text{Au g/t} \div 31.1\text{g/oz} \times \text{USD}1305/\text{oz} + \text{Ag g/t} \div 31.1\text{g/oz} \times \text{USD}18.78/\text{oz}) \div 0.73\text{USD/AUD}.</math> </li> </ul> <p>The X coefficient allows for the impacts of metallurgical recoveries of Cu and Au.</p> <p>Economic assumptions used for the NSR formula are provided below. They are drawn from OZ Minerals life-of-mine (LOM) Corporate Economic Assumptions released in Quarter 4 2018 and are the consensus values of major brokers issued in 2018.</p> <table border="1"> <thead> <tr> <th>Assumptions</th><th>Unit</th><th>LOM</th></tr> </thead> <tbody> <tr> <td>Copper</td><td>US\$/lb</td><td>2.96</td></tr> <tr> <td>Gold</td><td>US\$/oz</td><td>1305</td></tr> <tr> <td>Silver</td><td>US\$/oz</td><td>18.78</td></tr> <tr> <td>Exchange Rate</td><td>AUD/USD</td><td>0.73</td></tr> </tbody> </table>	Assumptions	Unit	LOM	Copper	US\$/lb	2.96	Gold	US\$/oz	1305	Silver	US\$/oz	18.78	Exchange Rate	AUD/USD	0.73
Assumptions	Unit	LOM															
Copper	US\$/lb	2.96															
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Silver	US\$/oz	18.78															
Exchange Rate	AUD/USD	0.73															
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li> <i>Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.</i> </li> </ul>	<p>Carrapateena has a high-grade core of bornite and chalcopyrite rich mineralisation that is amenable to SLC based on the current mine plan but, when combined with the broader chalcopyrite-pyrite zone, is likely to be amenable to Block Caving (BC). For the purpose of this statement it is assumed that BC will be a suitable method for extraction of the resource.</p> <p>Extraction of the resources has only been contemplated to a depth of 1,500m metres as mineralisation below 3,600 RL do not pass the current reasonable prospects test.</p>															

Criteria	JORC Code explanation	Commentary
		This Mineral Resource does not account for mining recovery.
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li><i>The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.</i></li> </ul>	Metallurgical test work on representative samples selected via a geometallurgical study have shown that a conventional crushing, grinding and flotation circuit would produce acceptable concentrate grades and metal recoveries.
<b>Environmental factors or assumptions</b>	<ul style="list-style-type: none"> <li><i>Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.</i></li> </ul>	<p>The Carrapateena deposit is located on Mineral Lease 6471 which expires in January 2039. This lease has an approved Program for Environmental Protection and Rehabilitation (PEPR) for the Sub-Level Cave Operation as required under the South Australian Government Mining Act 1971 (SA) and is in good standing.</p> <p>A referral for the Carrapateena project was submitted to the Australian Government's Department of the Environment and Energy (DoEE) on 10 March 2017. On 12 April 2017, DoEE released their decision on the referral as a 'controlled action' and this approval is in good standing.</p>
<b>Bulk density</b>	<ul style="list-style-type: none"> <li><i>Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.</i></li> <li><i>The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.</i></li> <li><i>Discuss assumptions for bulk density estimates used in the</i></li> </ul>	<p>The water immersion method was used for density determination. For Teck drill holes, the density was determined from a sample from almost every second metre of core in basement. For OZ Minerals drill holes in basement, the density was determined for the entire length of every metre for NQ core, or a representative sample from every metre of HQ or PQ core.</p> <p>OZ Minerals routinely repeated measurements and had 4 standards, NQ and HQ size each made of aluminium and titanium for QAQC purposes.</p>

Criteria	JORC Code explanation	Commentary
	<i>evaluation process of the different materials.</i>	The mineralised material is not significantly porous. Moisture has been estimated as described in the Moisture criterion in this table. The lithological domains were considered to be suitable for use as domains for density estimation.
<b>Classification</b>	<ul style="list-style-type: none"> <li><i>The basis for the classification of the Mineral Resources into varying confidence categories.</i></li> <li><i>Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).</i></li> <li><i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i></li> </ul>	<p>The basis for Mineral Resource classification is underpinned by the robustness of the conceptual geological model, quality of data and the continuity of geology and grade relative to the arrangement of data. OZ Minerals provided advice to the Competent Person relating to the quality of the data and the confidence in the interpretations of geology and mineralisation. The quality of the estimation of grades was assessed using the relative kriging variance, pass in which the estimate was made, slope of regression, distance to the nearest informing composite and number of holes used in the copper estimate. The confidences in the interpretations and copper estimate were then integrated. Finally, those parts of the model which were unlikely to satisfy the 'reasonable prospects test' (reasonable prospects for eventual economic extraction), were excluded from the resources, mainly based on contiguity, dimensions and grade within the context of the proposed mining method of BC.</p> <p>The Competent Person has checked, reviewed and integrated all of this information and subsequently assigned a classification of Measured, Indicated or Inferred Mineral Resource to the estimates; and excluded parts of the model that do not to satisfy the 'reasonable prospects test' from the Mineral Resources.</p> <p>Appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).</p>

Criteria	JORC Code explanation	Commentary
		The result appropriately reflects the Competent Person's view of the deposit.
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li><i>The results of any audits or reviews of Mineral Resource estimates.</i></li> </ul>	This Mineral Resource estimate was reviewed by AMC Consultants during September-October 2019. The review found that there were no material issues and resources were classified appropriately.
<b>Discussion of relative accuracy/ confidence</b>	<ul style="list-style-type: none"> <li><i>Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</i></li> <li><i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i></li> <li><i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>	<p>Factors affecting global accuracy and confidence of the estimated Mineral Resource at the selected cut-off include:</p> <p>Estimation artefacts, such as screening effects, introduced due to the orientation of much of the drillhole data in relation to the mineralisation (both sub-vertical), could affect the local accuracy but unlikely to affect the global accuracy of the estimates.</p> <p>Uncertainty of the position of domain boundaries, which is largely due to the arrangement of drill hole intersections. The size of the mineralised domain wireframes has a direct effect on the estimated tonnage of the Mineral Resource.</p> <p>The sensitivity of these estimates has been assessed by comparing them after varying assumptions about the nature of the domain boundaries (hard or transitional), treatment of very high grade composites and estimation method (OK vs. Inverse Distance). Differences were negligible and commensurate with the classification of the resources.</p> <p>The classification of the Mineral Resource has taken into consideration to the confidence in the position of domain boundaries given the distribution of drill hole data.</p> <p>The Mineral Resource estimate reported assumes enough local-scale detail to be useful for the technical and economic evaluation of a BC or SLC mining method.</p> <p>There has been no significant production from the Carrapateena deposit for comparison with the estimated Mineral Resource.</p>



## Competent Person Declaration - Mineral Resources

### Competent Person Statement

The information in this report that relates to Mineral Resources is based on information compiled by Stuart Masters, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy (108430) and a Member of the Australian Institute of Geoscientists (5683). Stuart Masters is a full-time employee of CS-2 Pty Ltd and has no interest in, and is entirely independent of, OZ Minerals. Stuart Masters has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC 2012). Stuart Masters consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Stuart Masters BSc (Geology), CFSG, has over 33 years of relevant and continuous experience as a geologist including 14 years in Iron-Oxide-Copper-Gold style deposits. Stuart Masters has visited site on 11 occasions since OZ Minerals acquired the project, including once since the Mineral Resource was reported in March 2019.

**Stuart Masters**

**CS-2 Pty Ltd**

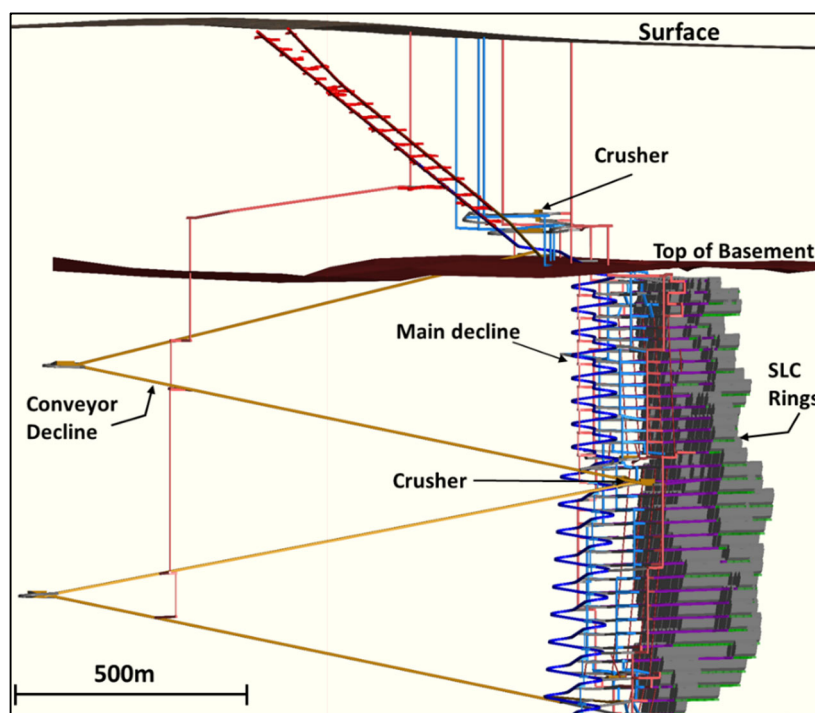
## Carrapateena Ore Reserves Statement as at 30 June 2019

### Summary

The Carrapateena Feasibility Study was completed in 2017, with mining development progressing to plan with 5 surface raise bores completed, excavation of the crusher chamber complete and access to the first production level completed. Since the Feasibility Study there have been a number of updates to the mine design including:

- A reorientation of the footprint to improve stress management
- Additional orepasses to improve ramp up
- Movement of crusher chamber due to changed geotechnical conditions
- Updates to the footprint based on changes to the resource and improved analysis of financial metrics and cut off values.

Mining of the Carrapateena deposit will be by sub level cave mining method, with a forecast mining rate of 4.25 MTPA. The current mine plan is to mine the entire deposit using sub level caving mining method, studies are continuing examining options to mine parts of the deposit using a block cave mining method. Processing of the concentrate will be though using standard size reduction through SAG mill and Ball mills, with separation through flotation.

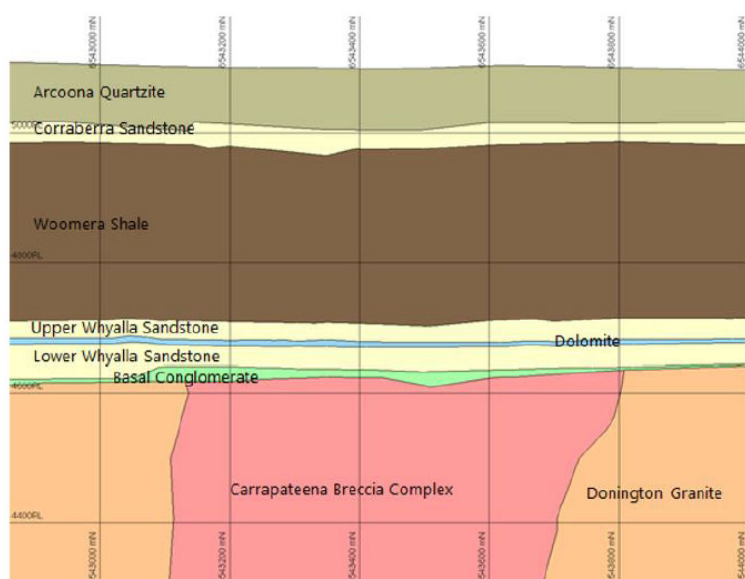


**Figure 4: Layout of mine design at Carrapateena**

Ore estimation is completed for the sub level cave (SLC) section of the mine using Power Geotechnical Cellular Automata code, typical flow parameters are assigned to the ore to estimate the tonnes and grade entering the mine. A program at Carrapateena has evaluated the best shut off and cut off parameters for the life of mine to give the best NPV, this mine plan has then formed the basis of this reserve.

Based on work from the Feasibility Study and additional test work, the Lower Whyalla sandstone unit has been found to be weaker than previously modelled, therefore since the last update additional mobility of this Lower Whyalla Sandstone has been increased by 100%, to reflect the weaker nature of this rock mass.

Inferred Mineral Resources are included in the Ore Reserves where it is dilution that is necessary for the mining method, which is a non-selective method. Inside the footprint all material is included in the Ore Reserves estimate. Infrastructure development outside of the caving footprint but in Inferred Mineral Resources has been excluded from the Ore Reserve Estimate.



**Figure 5: Cross Section of cover sequence at Carrapateena, used in flow modelling**

Since the 2017 Mineral Reserves statement there has been additional geotechnical modelling of the sub level cave, and its propagation to surface. This modelling has shown that to support cave growth and minimise early dilution a redesigned top levels was required. This redesign resulted in an extension on the top levels, to smooth out the footprint design and reduce potential dilution. In addition to this there has been additional optimisation of the mine design, and smoothing of the mined footprint shapes to be more conducive to even cave growth, as shown in Figure 6. This change has resulted in approximately 8% increase in tonnes, for a 4% increase in Copper tonnes. In addition to the footprint change, planned mining dilution from the strata material from the cover sequence, and material inside the mining footprint has been included in this Ore Reserves estimate, which increases the mining tonnes by approximately 6% and the Copper tonnes by 2% when compared to the 2017 Ore Reserves Statement.



A summary of the Carrapateena Ore Reserves estimate is presented in Table 5.

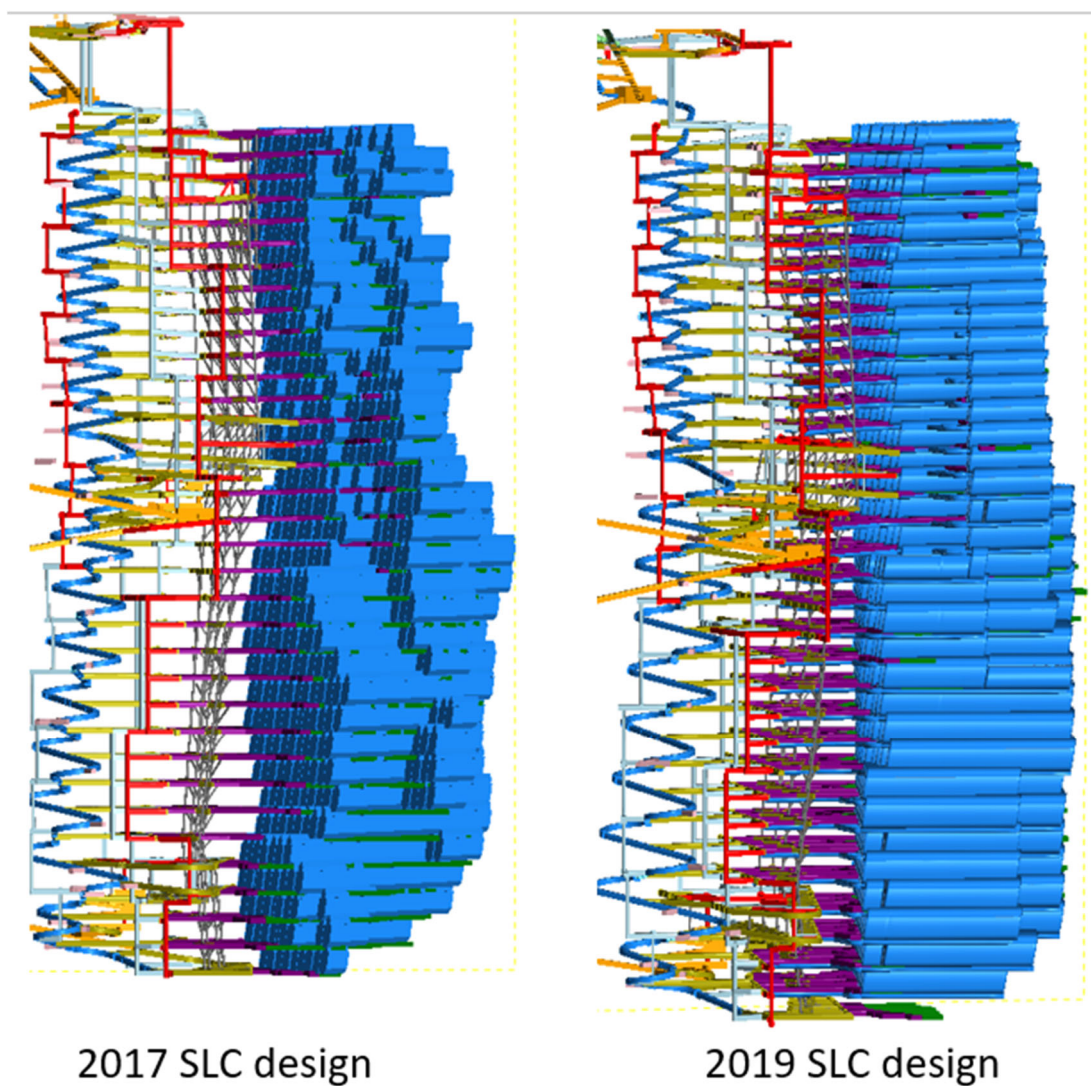
**Table 5: Carrapateena Ore Reserves estimate as at 30 June 2019<sup>456</sup>**

Category	Tonnes	Cu	Au	Ag	Cu	Au	Ag
	(Mt)	(%)	(g/t)	g/t	(kt)	(koz)	(Moz)
Proved	0	0	0	0	0	0	0
Probable	91	1.6	0.67	8	1500	1900	22
<b>Total</b>	<b>91</b>	<b>1.6</b>	<b>0.67</b>	<b>8</b>	<b>1500</b>	<b>1900</b>	<b>22</b>

<sup>4</sup> Table subject to rounding errors

<sup>5</sup> Inferred Resource material included in this cave design as dilution material is 3.7MT @ 0.3% Cu, 0.2g/t Au, 1.9g/t Ag

<sup>6</sup> Inferred Resource material excluded in this estimate but is part of the mine plan is 0.2MT @ 0.3% Cu, 0.07 g/t Au and 2.7g/t Ag



**Figure 6: Comparison between 2017 and 2019 design**

## JORC Code, 2012 Edition, Table 1

### Section 4 Estimation and Reporting of Ore Reserves

Criteria	JORC Code explanation	Commentary
<b>Mineral Resource estimate for conversion to Ore Reserves</b>	<ul style="list-style-type: none"> <li><i>Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.</i></li> <li><i>Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.</i></li> </ul>	<p>The Mineral Resources estimate used as a basis for the conversion to an Ore Reserves was the June 2019 resource that is released concurrently with this statement. The Mineral Resource statement has been compiled by Stuart Masters of CS-2 Pty Ltd.</p> <p>This resource has been updated as part of this release.</p> <p>The Mineral Resources detailed in that release are inclusive of the Ore Reserves reported in this release</p>
<b>Site visits</b>	<ul style="list-style-type: none"> <li><i>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</i></li> <li><i>If no site visits have been undertaken indicate why this is the case.</i></li> </ul>	<p>The Competent Person is a permanent employee of OZ Minerals, has visited site 12 times in the last financial year, and has inspected progress on the construction activity, raise boring and the first extraction level on the 4580 RL.</p>
<b>Study status</b>	<ul style="list-style-type: none"> <li><i>The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.</i></li> <li><i>The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.</i></li> </ul>	<p>A Feasibility Study was completed in 2017 which confirmed that Sub-Level Caving (SLC) was the appropriate mining method, and updated the mining rate to 4.25 MTPA. That study included appropriate modifying factors.</p> <p>The 2017 Feasibility Study contained robust economics indicating an economically robust project.</p> <p>Some of the modifying factors have been changed since the 2017 Ore Reserves statement, as noted below, to increase confidence with changes to mine plans and geotechnical conditions as the mine has progressed.</p>

Criteria	JORC Code explanation	Commentary
		Changes since the previous Ore Reserves statement in 2017 are based on the inclusion of cover rock dilution in the resource, as a result of changing the mobility assumptions of the Lower Whyalla Sandstone rock mass, small changes in the cut off and shut off values and the extension of the footprint in the top section of the orebody.
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li><i>The basis of the cut-off grade(s) or quality parameters applied.</i></li> </ul>	<p>Cut-off values for the mine design were based on iterative reviews of the design, cave flow simulation and economic analysis. A simplified version of NSR has been used as the basis of the cut off value in this analysis based on OZ Minerals' Q4 2018 economic assumptions, these are not materially different to the Q1 2019 economic parameters used for economic assumptions.</p> <p>The formula that has been used for the simplified NSR calculation is:  <math display="block">\text{SNSR} = X \times \text{In situ value (ISV)}</math> where X = <ul style="list-style-type: none"> <li>0.4 + 0.5* Cu% for Cu% &lt; 0.6</li> <li>0.7 for Cu% ≥ 0.6%</li> </ul> and <ul style="list-style-type: none"> <li><math display="block">\text{ISV} = (\text{Cu \%} \div 100\% \times 2204\text{lb/t} \times \text{USD}2.96/\text{lb} + \text{Au g/t} \div 31.1\text{g/oz} \times \text{USD}1305/\text{oz} + \text{Ag g/t} \div 31.1\text{g/oz} \times \text{USD}18.78/\text{oz}) \div 0.73\text{USD/AUD}.</math></li> </ul> <p>Recovered SLC ore, including dilution, is forecast using Power Geotechnical Cellular Automata (PGCA) software to simulate cave flow and ore recovery based on the Mineral Resource block model. Input parameters for PGCA were based on parameters used at other SLC operations which use PGCA software, plus some site specific factors. Test work has been completed on the mobility of the weaker overburden geological unit and this input into PGCA updated since the Feasibility Study that was completed in 2017. These parameters will be further refined using reconciliation data and monitoring data</p> </p>

Criteria	JORC Code explanation	Commentary
		<p>from the cave flow and cave propagation, once the project is in production.</p> <p>A range of shut-off values were modelled in PGCA to assess the SLC inventory variability, and high-level schedules undertaken for each case. These have been updated since the 2017 Feasibility Study, and the footprint has been redesigned based on a cut-off value of \$95 /tonne and the material draw stopped at a shut-off value of \$90 /tonne.</p> <p>The optimisation was then performed on the mining and milling physicals using the CY19 Q2 CEA prices to determine the best mine plan which has been based on optimising Net Present Value after tax. Adjustments were made to the PGCA generated SLC footprint to take into account mining practicality and to ensure a smoother cave shape. Any SLC production ring and the development associated with it within the final cave footprint was classified as ore, regardless of the NSR value or resource classification, with the result that some rings are deemed ore despite being below the cut-off value, and some caved material that is below the shut off value included. The total of this material that is included as dilution is 3.7 MT @ 0.3% Cu, 0.2 g/t Au and 1.9g/t Au.</p> <p>All development outside the caving footprint designed within a Measured or Indicated Resource was assessed against a cut-off grade of 0.2% Cu, to cover processing, general and administrative cost but not the mining cost. Any development material meeting both of these criteria has been included in the Ore Reserve estimate.</p>

Criteria	JORC Code explanation	Commentary
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li><i>The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).</i></li> <li><i>The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.</i></li> <li><i>The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc), grade control and pre-production drilling.</i></li> <li><i>The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).</i></li> <li><i>The mining dilution factors used.</i></li> <li><i>The mining recovery factors used.</i></li> <li><i>Any minimum mining widths used.</i></li> <li><i>The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.</i></li> <li><i>The infrastructure requirements of the selected mining methods.</i></li> </ul>	<p>The Pre-Feasibility Study completed in 2016 concluded that Sub-Level Caving was the preferred mining method for Carrapateena. The updated 2017 study retained this mining method, with modified access, ventilation and material handling designs. Additional modifications to the mine have occurred since the 2017 Feasibility Study, including changing the orientation of the mine layout due to stress direction measurement, and repositioning one of the planned crusher excavations into a higher strength rock mass.</p> <p>Geotechnical parameters and engineering assessments have determined that the rock mass above the mine design area will cave and propagate to surface. During the reorientation of the mining layout, the footprint of the upper levels of the cave were expanded beyond the optimum economic footprint in order to ensure cave initiation and propagation. Geotechnical logging and simulation has been completed, and it has been determined that preconditioning is not required for the mine to propagate though to surface.</p> <p>OZ Minerals staff used Power Geotechnical's proprietary PGCA software to simulate cave flow and ore recovery, including dilution. Input parameters for PGCA were based on parameters used at other SLC operations which use PGCA software, plus some site-specific factors.</p> <p>PGCA outputs include dilution, and no additional mining dilution factors were incorporated in the Ore Reserve estimate for SLC material.</p>

Criteria	JORC Code explanation	Commentary
		<p>Dilution includes material overlying the SLC design and from the edges of the cave. The overlying Woomera Shale unit and the Lower Whyalla Sandstone unit has the potential to degrade into finer particles than the other rock types overlying the cave. For this reason, the cave flow modelling in PGCA assumed that the Woomera Shale and Lower Whyalla Sandstone unit had twice the migration velocity compared to the other rock types.</p> <p>A sensitivity analysis was undertaken on the fines migration speed which indicated that if the migration speed was similar to the rest of the overlying strata there would be an improvement in value of approximately \$2/t value compared to the base case. If the fines migration was 3x the average, there would be a reduction in value of approximately \$4/t value compared to the base case.</p> <p>For SLC production rings generated by PGCA which were included in the final cave design footprint, 74% of the tonnes inside the cave footprint were recovered, for 81% of the contained metal. Where additional production rings with value less than the cut-off value were added to refine the cave shape, 40% of the in-situ tonnes blasted were recovered.</p> <p>The mine design incorporates 25m sublevel spacing changing to 30m sublevel spacing later in the mine life, 5m wide production drives at a spacing of 15m (centre to centre) and a standard SLC ring design. The PGCA model assumed a draw width of 11m, based on experience at other similar SLC operations.</p> <p>Sub-Level Caving is a non-selective, bulk mining method in which dilution is incurred to recover economic ore. Inferred Mineral Resources that have been modelled as recovered in the PGCA cave flow model or development inside the designed cave footprint, has been included in the financial evaluation of the study, as they are inextricably linked in the mining method.</p>

Criteria	JORC Code explanation	Commentary														
		<p>The quantity of Inferred Resource material that is included in the financial evaluation, and also included in the Ore Reserves is.</p> <table><tr><td>Tonnage Mt</td><td>3.7</td></tr><tr><td>Cu%</td><td>0.32</td></tr><tr><td>Au g/t</td><td>0.17</td></tr><tr><td>Ag g/t</td><td>1.9</td></tr><tr><td>Cu (kt)</td><td>12</td></tr><tr><td>Au koz</td><td>20</td></tr><tr><td>Ag koz</td><td>230</td></tr></table>	Tonnage Mt	3.7	Cu%	0.32	Au g/t	0.17	Ag g/t	1.9	Cu (kt)	12	Au koz	20	Ag koz	230
Tonnage Mt	3.7															
Cu%	0.32															
Au g/t	0.17															
Ag g/t	1.9															
Cu (kt)	12															
Au koz	20															
Ag koz	230															
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"><li>• <i>The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.</i></li><li>• <i>Whether the metallurgical process is well-tested technology or novel in nature.</i></li><li>• <i>The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.</i></li><li>• <i>Any assumptions or allowances made for deleterious elements.</i></li><li>• <i>The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.</i></li><li>• <i>For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?</i></li></ul>	<p>Metallurgical test work has shown that a conventional crushing, grinding and flotation circuit would produce internationally saleable concentrate with acceptable metal recoveries.</p> <p>The metallurgical process is well-tested technology.</p> <p>The ore is described by 5 flotation domains based on mineralogy, test work has been completed post the study to improve the recovery estimation, recovery grade relationships have been completed for each of the 5 flotation groups</p> <p>The average metallurgical recoveries in the current mine plan are: Copper 92%, Gold 76%, Silver 76%.</p> <p>Metallurgical domains are based on the resource domains, which were largely driven by mineralogical and chemical properties of the rocks.</p> <p>The Carrapateena Mining Reserves are expected to produce a high quality copper grade concentrate containing gold and silver by products and very low levels of impurities such as uranium. Standard industry commercial scales for payable metals and impurities shall apply.</p>														



Criteria	JORC Code explanation	Commentary
		The concentrate produced by the Carrapateena Project will be marketable to international smelters in its own right. Metallurgical test work has confirmed between 50% to 70% downgrade of uranium grade when processing Run-of-Mine ore through the flotation circuit, without the requirement for a Concentrate Treatment Plant (CTP).
<b>Environmental</b>	<ul style="list-style-type: none"> <li><i>The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.</i></li> </ul>	<p>The Carrapateena deposit is located on Mineral Lease 6471 which expires in January 2039. This lease has an approved Program for Environmental Protection and Rehabilitation (PEPR) for the Sub-Level Cave Operation as required under the South Australian Government Mining Act 1971 (SA) and is in good standing.</p> <p>A referral for the Carrapateena project was submitted to the Australian Government's Department of the Environment and Energy (DoEE) on 10 March 2017. On 12 April 2017, DoEE released their decision on the referral as a 'controlled action' and this approval is in good standing.</p>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li><i>The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.</i></li> </ul>	<p>Infrastructure sufficient for the operation of the 4.25 Mtpa SLC mine and processing plant has been designed and is included in the financial evaluation of the project.</p> <p>There are no identified impediments to the success of proposed infrastructure.</p>
<b>Costs</b>	<ul style="list-style-type: none"> <li><i>The derivation of, or assumptions made, regarding projected capital costs in the study.</i></li> <li><i>The methodology used to estimate operating costs.</i></li> <li><i>Allowances made for the content of deleterious elements.</i></li> <li><i>The source of exchange rates used in the study.</i></li> <li><i>Derivation of transportation charges.</i></li> <li><i>The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.</i></li> <li><i>The allowances made for royalties payable, both Government and private.</i></li> </ul>	<p>Mining capital and operating costs were reviewed as part of the updated study, and were re-estimated from first principles. Where practicable, operating cost estimates were compared to expenditure incurred to date on the Tjati access decline. Capital costs were estimated based on quotes for equipment from a database of suppliers.</p> <p>Other costs estimated in the 2017 FS were reviewed and updated where appropriate.</p>

Criteria	JORC Code explanation	Commentary										
		<p>Commodity price and FX assumptions used in the evaluation are drawn from 2019 Corporate economic assumptions released in the Second Quarter of 2019 which are the consensus values of major brokers issued in March 2019.</p> <p>Transportation charges were estimated having regard to current market conditions and expectation for the future.</p> <p>Commercial costs including TCRCs, penalties etc. were estimated having regard to market benchmarks and future expectations.</p> <p>The South Australian State royalty will be 2.5% of Mine gate Value for the first five years of production, and 5% thereafter. There is an additional NTMA royalty on top of the state royalties. An additional 0.5% royalty cost has been applied in the financial model to take into account other stakeholders.</p>										
Revenue factors	<ul style="list-style-type: none"><li><i>The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.</i></li><li><i>The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.</i></li></ul>	<p>The Economics of the Ore Reserve estimate is based on long term (Lt) economic parameters and were updated post the calculation of SNSR for optimisation and validation work. These parameters are shown in the table following, being the consensus values of major brokers issued in March 2019.</p> <table><tr><td colspan="2">Economic Parameter Units</td></tr><tr><td>LT copper price</td><td>\$2.94 US / lb</td></tr><tr><td>LT Gold Price</td><td>\$1246 US / oz</td></tr><tr><td>LT Silver Price</td><td>\$17.20 US / oz</td></tr><tr><td>AUD / US</td><td>0.73</td></tr></table>	Economic Parameter Units		LT copper price	\$2.94 US / lb	LT Gold Price	\$1246 US / oz	LT Silver Price	\$17.20 US / oz	AUD / US	0.73
Economic Parameter Units												
LT copper price	\$2.94 US / lb											
LT Gold Price	\$1246 US / oz											
LT Silver Price	\$17.20 US / oz											
AUD / US	0.73											

Criteria	JORC Code explanation	Commentary	
		Land freight	\$51.62 AUD / wmt
		Loading cost	\$14 AUD / wmt
		Sea freight	\$49 US / wmt
		Copper concentrate smelting	\$85 US / dmt
		Copper refining	\$0.085 US / lb
		Gold refining	\$5.00 US / oz
		Silver Refining	\$0.50 US / oz
		<b>Copper Grade in Concentrate</b>	<b>Copper Payable</b>
		0-35%	96.75%
		35-45%	97%
		45-50%	97.25%
		> 50%	97.5%
		<b>Gold Grade in Concentrate</b>	<b>Gold payable</b>
		0-5 g/t	93%
		5-10 g/t	95%
		10-20 g/t	96%
		> 20 g/t	97%
		<b>Silver Grade in Concentrate</b>	<b>Silver payable</b>
		<30 g/t	0
		>30 g/t	90%

Criteria	JORC Code explanation	Commentary
<b>Market assessment</b>	<ul style="list-style-type: none"> <li><i>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.</i></li> <li><i>A customer and competitor analysis along with the identification of likely market windows for the product.</i></li> <li><i>Price and volume forecasts and the basis for these forecasts.</i></li> <li><i>For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</i></li> </ul>	<p>Copper concentrates are sold on the open concentrate market to a range of overseas smelters.</p> <p>The Ore Reserve estimate uses OZ Minerals forecast assumptions shown in the tables above to estimate the revenue and cost of sales. Revenue is determined by the metal content, metal payable scales negotiated for the product and the price assumptions.</p> <p>The cost of sales includes the transport costs from mine to customer, the negotiated smelter treatment and refining charges and commercial remedies for deleterious elements. The smelter treatment and refining charges are typically negotiated on an annual basis directly with customers with regard to industry benchmark terms. Deleterious elements are accounted for in the concentrate product, with penalty scales on a pro rata basis according to their content.</p> <p>There is a proven ability by OZ Minerals to sell and a proven acceptance by buyers (smelters) to purchase a concentrate of the quality which will be produced by Carrapateena. Any improvements on concentrate quality such as higher concentrations of payable metals or decreased deleterious elements achieved through technical processes will increase the saleability of the concentrate.</p>
<b>Economic</b>	<ul style="list-style-type: none"> <li><i>The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.</i></li> <li><i>NPV ranges and sensitivity to variations in the significant assumptions and inputs.</i></li> </ul>	<p>Carrapateena is an economically robust project, generating a strong NPV and high IRR at current economic assumptions as outlines in the Revenue Factors of this statement.</p> <p>Sensitivity analyses were carried out and the project was found to be sensitive to commodity prices. For all sensitivity scenarios modelled project NPV remained positive. A discount rate of 10% was used in the analysis.</p>

Criteria	JORC Code explanation	Commentary
<b>Social</b>	<ul style="list-style-type: none"> <li><i>The status of agreements with key stakeholders and matters leading to social licence to operate.</i></li> </ul>	<p>The Carrapateena deposit is located on Mineral Lease 6471 which expires in January 2039. This lease has an approved Program for Environmental Protection and Rehabilitation (PEPR) for the Sub-Level Cave Operation as required under the South Australian Government Mining Act 1971 (SA) and is in good standing.</p> <p>A referral for the Carrapateena project was submitted to the Australian Government's Department of the Environment and Energy (DoEE) on 10 March 2017. On 12 April 2017, DoEE released their decision on the referral as a 'controlled action' and this approval is in good standing.</p> <p>Studies have commenced to understand the potential environment impacts and risks associated with the Carrapateena Expansion Project including groundwater, surface water, air quality and socioeconomic modelling and assessment of effects studies and will form the basis of a project variation submission and approval process with the South Australian Government.</p>
<b>Other</b>	<ul style="list-style-type: none"> <li><i>To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:</i></li> <li><i>Any identified material naturally occurring risks.</i></li> <li><i>The status of material legal agreements and marketing arrangements.</i></li> <li><i>The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.</i></li> </ul>	<p>OZ Minerals advises that Carrapateena is in compliance with all legal and regulatory requirements.</p>

Criteria	JORC Code explanation	Commentary
<b>Classification</b>	<ul style="list-style-type: none"> <li><i>The basis for the classification of the Ore Reserves into varying confidence categories.</i></li> <li><i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i></li> <li><i>The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).</i></li> </ul>	<p>Measured Resources and Indicated Resources recovered in the cave flow model have been converted to Probable Ore Reserves.</p> <p>The Ore Reserve classification reflects the Competent Person's view of the deposit, with supporting information provided by others.</p> <p>Approximately 27% of the Probable Ore Reserves Copper Content has been derived from Measured Mineral Resources. The absence of Proved Reserves derived from Measured Mineral Resources is due to the inherent lack of selectivity with the SLC mining method, which precludes the ability to exactly quantify the source of material recovered at underground draw points</p>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li><i>The results of any audits or reviews of Ore Reserve estimates.</i></li> </ul>	<p>The Ore Reserve estimate has been reviewed by OZ Minerals in their peer review process, and has been subjected to an independent external review by Worley. No material issues were identified during the reviews undertaken.</p>
<b>Discussion of relative accuracy/ confidence</b>	<ul style="list-style-type: none"> <li><i>Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.</i></li> <li><i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i></li> </ul>	<p>It is the opinion of the Competent Person that the Ore Reserve estimate is supported by appropriate design, scheduling, and costing work reported to above a Feasibility Study level of detail.</p> <p>No statistical procedures were carried out to quantify the accuracy of the Ore Reserve estimate.</p> <p>There is greater uncertainty inherent in caving mining methods than in more selective mining methods. The non-selective nature of the Sub-Level Cave mining method precludes the ability to exactly quantify the source of material recovered at underground draw points. Recovered grades are estimated with PGCA cave flow modelling software using input assumptions developed from experience at other operations using the same mining method.</p>

Criteria	JORC Code explanation	Commentary
	<ul style="list-style-type: none"> <li>Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.</li> <li>It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</li> </ul>	<p>Calibration of the flow model will be required once production commences, and thereafter at regular intervals in order to validate the assumptions used in the PGCA cave flow modelling software. Cave markers have been installed into the overburden material to measure the migration of this material to further calibrate the PCGA models as more information is gained.</p> <p>The Ore Reserves was estimated using a shut-off value significantly higher than the breakeven value calculated with the project financial model. It is unlikely to be significantly impacted by adverse changes in metal prices or operating costs.</p> <p>The speed of fines migration through the cave column will influence the value of material recovered. Accelerated rates of migration in excess of what has been assumed in the study will adversely affect the value of material drawn. Conversely, lower migration rates would see an increase in value</p>

## Competent Person Declaration - Ore Reserves

### Competent Person Statement

The information reported on the Ore Reserves is based on and fairly represents information and supporting documentation compiled by Dr Rodney Hocking BE (Mining), PhD Mineral Processing, and member of the AusIMM (MN 317073). Dr Hocking is a full time employee of OZ Minerals and a participant in employee issued shareholder benefits.

Dr Hocking has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC 2012). Dr Hocking consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

This Ore Reserves Statement has been compiled in accordance with the guidelines defined in the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition).

**Rodney Hocking**

**OZ Minerals**