

**OZ Minerals Limited**

**WEST MUSGRAVE PROJECT**

**Nebo-Babel Deposits**

**Ore Reserve Statement and Explanatory  
Notes**

**As at 11th Feb 2020**

**WEST MUSGRAVE ORE RESERVE STATEMENT – 11TH FEBRUARY 2020****1. Project Overview**

The West Musgrave maiden Ore Reserve Statement relates to the Babel and Nebo nickel-copper deposits located in Western Australia. The deposits are located approximately 1,300 kilometres northeast of Perth near the border with South Australia and the Northern Territory (Figure 1).

**Figure 1: Project Location**

BHP acquired the project as part of the takeover of WMC Resources in 2005. WMC Resources and BHP undertook separate drilling campaigns from 2001-02 and 2006-11, respectively. Cassini Resources purchased the project from BHP in April 2014 and completed a significant infill drilling campaign at Nebo-Babel followed by a Scoping Study in April 2015 which showed favourable results.

Cassini Resources Limited is a base and precious metals developer and explorer based in Perth. Cassini is progressing its Mt Squires Gold Project which is located to the west of the West Musgrave Project.

OZ Minerals signed an earn-in and joint venture agreement in October 2016 with Cassini Resources for the West Musgrave Project with OZ Minerals earning a 70% equity stake in the project in April 2019 by contributing \$36 million towards the Pre-Feasibility Study and regional exploration.

A Pre-Feasibility Study has been completed for the project which envisages mining the deposits via open pit methods. The Ore Reserve estimate was drawn from the West Musgrave Pre-Feasibility Study and this Reserve Statement should be read in conjunction with the ASX Release for West Musgrave Pre-Feasibility Study<sup>1</sup>.

The Ore Reserve estimate for West Musgrave as at 11<sup>th</sup> February 2020 is summarised in Table 1. All dollars are expressed as Australian Dollars unless noted.

**Table 1: West Musgrave Ore Reserve Estimate as at 11<sup>th</sup> February 2020<sup>2</sup>**

Deposit	Classification	Ore (Mt)	Ni (%)	Cu (%)	Au (ppm)	Ag (ppm)	Co (ppm)	Pd (ppm)	Pt (ppm)	Ni Metal (kt)	Cu Metal (kt)
Nebo	Probable	20	0.48	0.40	0.04	0.8	180	0.10	0.10	100	80
Babel	Probable	200	0.32	0.36	0.06	1	120	0.10	0.10	630	700
<b>Total<sup>2</sup></b>	Probable	<b>220</b>	<b>0.33</b>	<b>0.36</b>	<b>0.06</b>	<b>1</b>	<b>120</b>	<b>0.10</b>	<b>0.10</b>	<b>720</b>	<b>790</b>

**Notes:** NSR cut-off \$28/t ore<sup>3</sup>. The table is subject to rounding errors.

## 2. Ore Reserve Classification

The maiden West Musgrave Ore Reserve as at 11<sup>th</sup> February 2020 is derived from the nickel-copper Mineral Resources<sup>4</sup> of the Babel and Nebo deposits. The Resource models and their construction are described in the Mineral Resource Estimate. The Mineral Resources are inclusive of the Ore Reserves.

All Probable Ore Reserves have been derived from Indicated Mineral Resources in accordance with Joint Ore Reserve Committee (JORC) Code 2012 guidelines.

The Ore Reserve classification reflects the Competent Persons' view of the deposits.

## 3. Mining Methods

The West Musgrave project considers the Babel and Nebo deposits (Figures 2). Both deposits are near surface and most suitable to be mined by open pit mining methods utilising conventional mining equipment with each deposit developed in multiple stages.

The selected mining method, design and extraction sequence are tailored to suit orebody characteristics, minimise dilution and ore loss, defer waste movement, utilise planned process plant capacity and expedite cash generation in a safe manner.

<sup>1</sup> See OZ Minerals announcement titled "West Musgrave Pre-Feasibility Study presents a low carbon, long-life, low-cost mine As at 11<sup>th</sup> February 2020", released on 11 February 2020 and available at: [www.ozminerals.com/media/asx/](http://www.ozminerals.com/media/asx/)

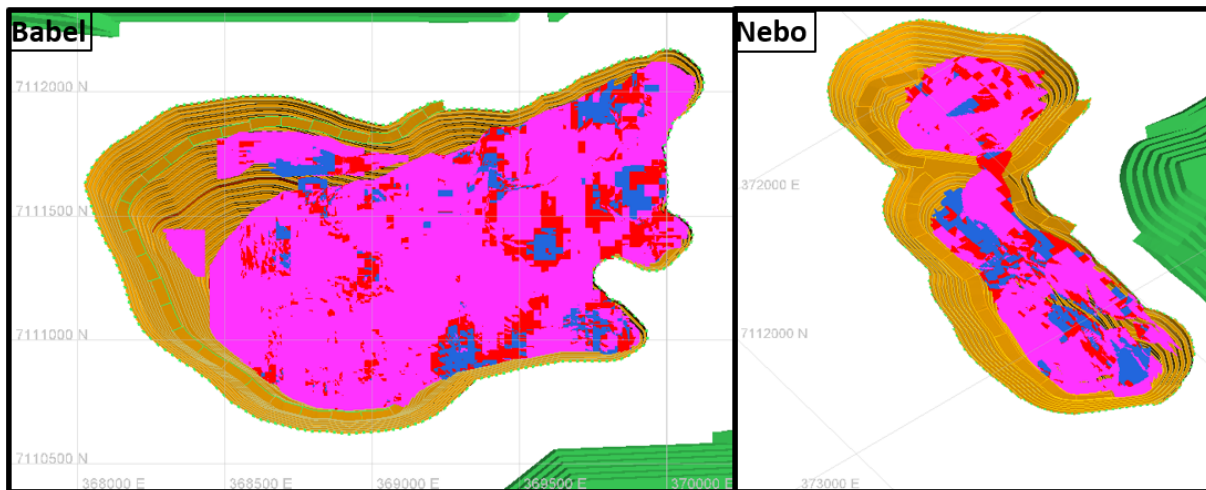
<sup>2</sup> Data are reported to significant figures to reflect appropriate precision in the estimate and this may cause some apparent discrepancies in totals.

<sup>3</sup> Net smelter return (NSR) details can be found under Section 3 "Cut-off parameters" in the attached JORC Table 1 documentation

<sup>4</sup> See OZ Minerals announcement titled "West Musgrave Project Nebo-Babel Deposits Mineral Resource Statement and Explanatory Notes' As at 11<sup>th</sup> February 2020", released on 11 February 2020 and available at: [www.ozminerals.com/media/asx/](http://www.ozminerals.com/media/asx/)

Mine planning including pit optimisation, mine design, scheduling and cost modelling for the two deposits was completed in collaboration with AMC Consultants Pty Ltd (AMC). This together with other studies has allowed the design of the site layout including site haul roads, pit access roads, detailed pit stage development designs, waste dumps, topsoil stockpiles, mine workshops and run of mine (ROM) ore pads (Figure 3).

**Figure 2: Pit designs (isometric view) for both deposits showing Mineral Resource grades >0.15%Ni**



#### 4. Cut-Off Grade and Metal Price

A Mining 'Hill of Value' study was undertaken to identify the optimum processing rate and mining cut-off grade. The study considered processing rates between 8Mtpa to 26Mtpa and tested a range of increased cut-off criteria to determine the best project value. This has determined a 10Mtpa optimum processing rate and an elevated cut-off grade of +\$8/t ore above break-even cut-off as an optimum cut-off.

The Ore Reserve was estimated using the life-of-mine (LOM) economic parameters drawn from OZ Minerals Corporate Economic Assumptions released in Quarter 3 2019 and a Net Smelter Return (NSR) cut-off value of \$28/t ore. The revenue of the project is derived from all of the elements listed in Table 2.

The cut-off value equates to the processing cost (with the inclusion of General Admin, sustaining capital, corporate overhead and mine rehabilitation fund), ore rehandle, and an \$8/t ore increase. NSR is calculated on a block by block basis and also included royalties, concentrate payabilities, concentrate transport and penalties.

**Table 2: West Musgrave Ore Reserve Optimisation Economic Assumptions**

Parameter	Units	LOM
Nickel	US \$ / lb	7.16
Copper	US \$ / lb	2.94
Gold	US \$ / oz	1,246
Silver	US \$ / oz	17.19

Platinum	US \$ / oz	1,311
Palladium	US \$ / oz	633
Cobalt	US \$ / lb	21.90
Exchange Rate	AUD / USD	0.73

## 5. Ore Reserve Estimation Methodology

The Ore Reserve estimate is based on the Mineral Resource estimates classified as Indicated after consideration of all modifying factors such as legal, environmental, geological, geotechnical, mining, metallurgical, social, economic and financial aspects.

Inferred Mineral Resources were excluded from pit optimisation, mine schedules and economic valuations utilised to validate the economic viability of the Ore Reserves. The Ore Reserve is technically and economically viable without the inclusion of Inferred Resource.

Prior to pit optimisation, the Mineral Resource model was regularised to Selective Mining Unit (SMU) blocks of 10m E x 10m N x 5m RL to generate a diluted mining model. The SMU block reflects expected mining equipment size, the geometry of the geology and anticipated ore loss. Mining dilution and ore loss were applied through regularisation of the Resource model. The overall effect was 2.6% dilution and 4.3% ore loss applied to the mining model used for mine planning.

The Resource model was optimised using the Lerchs-Grossman (LG) algorithm with industry standard software. Nested pit shells were generated and tested with sensitivities on mining cost, processing cost, metal price, recoveries, and slope angles. This formed the basis of the selection of the optimal pit shell for the Babel and Nebo deposits. Interim pit shells provided guidance for pit stages to maximise value and achieve operational design requirements.

The resultant pit shells were used to develop detailed pit designs with due consideration of geotechnical slope parameters, minimum mining widths, bench heights, and ramp widths suitable for proposed mining equipment. These pit designs were used as the basis for production scheduling and economic evaluation.

The mining schedule is based on realistic mining productivity and equipment utilisation estimates, and considered the pit development requirements, the selected mining fleet productivity and the vertical rate of mining development. Staged pit designs along with a stockpiling strategy were applied to ensure a continuous supply of ore while deferring waste mining for as long as practically possible.

The mining schedule is based on supplying suitable material to the processing plant with a name plate capacity of 10Mtpa, planned to be achieved in the 2nd year after implementation as indicated in the Pre-Feasibility Study Report announced simultaneously with this release.

The Ore Reserve has been supported by sourcing mining Capital Expenditure (CAPEX) from original equipment manufacturers (OEM)s for the proposed mining fleet, and mining Operation Expenditure (OPEX) was estimated from a first principle cost model and mine schedule physicals. Equipment hours and requirements were estimated from haul cycles, production rates, availabilities and utilisation. Operational and maintenance labour was estimated from equipment hours.

The mine was assumed it will be contractor operated during the pre-strip plus the first five years and owner operated from year six onwards. The pre-strip was scheduled in the initial six-month pre-

processing commissioning for waste stripping of the Babel pit and aiming for approximately 500kt Non-Pyrite-Violarite (Non-PV) ore stockpiled ready for reclamation on day one of commissioning.

The final pit design is the basis of the Ore Reserve estimate. The Mineral Resource within the final pit design was converted to Ore Reserve by applying a Net Smelter Return (NSR) cut-off value of \$28/t ore.

**Figure 3: Mining Layout**



## 6. Geotechnical Engineering

Geotechnical modelling was completed based on field logging and laboratory testing of selected diamond drill core samples from a total of ten (10) diamond cored boreholes within the pit shell, drilled for metallurgical (6 holes) and specific geotechnical purposes (4 holes).

The geotechnical slope design parameters used were based on work completed by Xstract Mining Consultants Pty Ltd. Further peer reviews on the Geotechnical report were conducted internally by an OZ Minerals Principal Geotechnical Engineer. In the review, the Principal Geotechnical Engineer considered that the development of slope design parameters was in line with industry standard. The open pit designs were based on the recommended geotechnical design parameters and assume dry slopes based on the assumption of adequate dewatering and/or depressurisation ahead of mining.

There are various slope configurations based on the geotechnical rock domains and location in the mine schedule.

## 7. Metallurgy and Processing Assumptions

The West Musgrave process facility has been designed to process 10Mtpa of nickel copper sulphide ore. The plant has been designed to operate 24 hours a day seven days per week at a nominal treatment rate of 1,250 dry tph. The design milling utilisation is 91.3% or 8,000 hours per year. The processing facility utilises recognised technology for sulphide ore processing circuits and follows a processing route of:

- Crushed ore stockpiling and reclaiming
- Grinding and classification
- Bulk rougher flotation.
- Rougher concentrate re-grind
- Two stages of cleaner flotation
- Separation circuits for copper and nickel concentrates
- Copper and nickel concentrate thickening, filtration and storage
- Tailings thickening and disposal.

Metallurgical assumptions are based on recent metallurgical test work as part of the ongoing studies and broken down by weathering including Pyrite-Violarite (PV), Transitional and Primary (non-PV).

PV ore is associated with the weathered portion of the deposits and is less amenable to the flotation process, hence lower nickel recoveries are expected in these domains.

The PV ore type contributes 4% of total tonnes, but its treatment in the mine plan has demonstrated a positive impact to project revenue. PV ore does however have a poisoning effect on fresh ore, reducing its nickel recovery. PV ore must be treated in separate batches. The current recovery assumption is that it will be batch treated approximately every ten weeks.

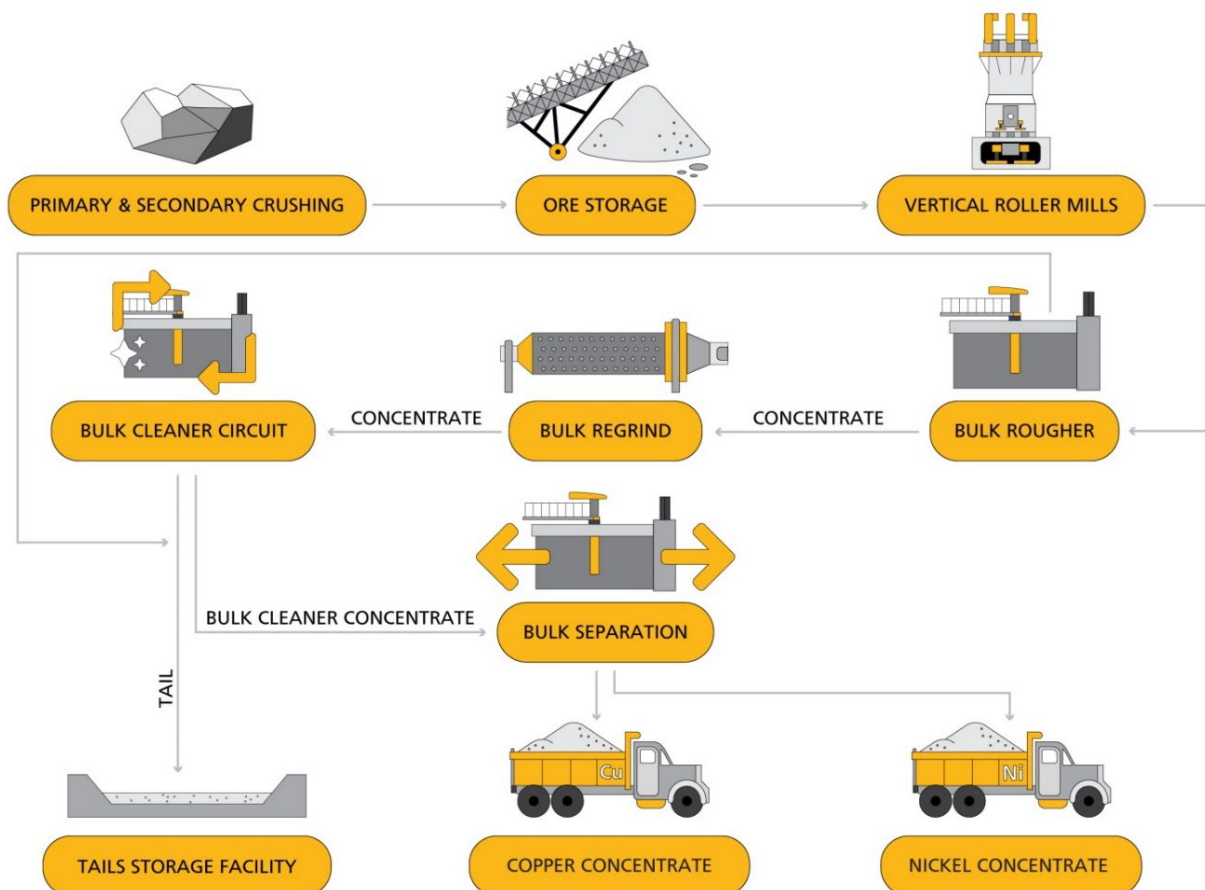
The metallurgical recoveries used for each ore type are shown in Table 3.

**Table 3: Metallurgical Recoveries**

Ore Type	Metal	Recovery %		
		Ni% > 0.25	0.20 ≤ Ni% < 0.25	0.15 ≤ Ni% < 0.19
Non-PV	Nickel	74.1	60.3	50.3
	Copper	79.4	73.9	65.9
PV	Nickel	32.5	26.6	20.1
	Copper	71.6	66.9	59.4

The simplified plant flowsheet is shown in Figure 4.

**Figure 4: Process Flowsheet**



## 8. Social, Environmental and Approval

A series of environmental baseline studies commenced in May 2018 with the aim of characterising the existing environment and identifying any associated project and approvals risks. The baseline



environmental program has included an assessment of flora and vegetation, landforms, subterranean fauna, terrestrial environmental quality (including both mineralised and non-mineralised waste), terrestrial fauna, inland waters, air quality, heritage, archaeology, social surrounds and human health. The baseline program will continue until around March 2020 around which time the project will be referred to the Western Australia EPA under Section 38 of the Environment Protection Act. This referral program represents the first primary approval under the Western Australian Government.

The study program to date represents a thorough assessment of the proposed project area in-line with the requirements of the Western Australian EPA guidelines. To date no material environmental or approvals risks have been identified.

A program of materials characterisation has occurred to classify potentially problematic mineralised waste rock. The materials characterisation has included both static and kinetic testing of various waste rock lithologies. To date, results indicate that waste rock material with potential acid forming (PAF) represents only a small portion of the overall waste rock generation and will be encapsulated in accordance with Western Australian requirements within onsite waste rock dumps. All waste rock dumps will be designed in accordance with Western Australian requirements and approvals conditions.

A PFS level program to confirm water supply was carried out throughout 2019. The program included the drilling and pumping of 13 dedicated water bores. These bores were pump tested to test specific parameters about the availability of groundwater supply within this system. The study concluded that the local aquifer system has enough supply to support the anticipated water requirements of the project, and that water quality meets the project specifications. Further testing will occur throughout the feasibility study to validate the findings of the PFS water supply study.

Two project related Native Titles were determined for the area in 2005 and 2008. An Indigenous Land Use Agreement (ILUA) was established in 2005. The Joint Venture currently have a deed of agreement over the proposed project development area with the Traditional Owners for Exploration with provisions for this agreement to become a mining agreement subject to the negotiation of methods for mining and compensation.

The Joint Venture has developed and maintained a close relationship with the Traditional Owners and has ensured that the community have been involved in the ongoing development of the project.

A program of consultation for mining agreement-making is currently ongoing and negotiations will occur throughout 2020. The mining agreement-making process is expected to conclude before the completion of the feasibility study. The Traditional Owners are highly supportive of the project to commence. The Joint Venture has no reason to believe that agreement will not be achieved prior to the completion of the feasibility study.

A social impact and opportunity assessment (SIOA) has been co-designed with the Ngaanyatjarra Council Aboriginal Corporation and the University of Queensland (Centre for Social Responsibility in Mining Sustainable Minerals Institute). The SIOA will be undertaken in 2020 and will form a quantitative baseline dataset to help inform decision-making for social programming and investment opportunities. A program of work relating to tenement security, land access and regulatory approvals has been ongoing since May 2018 and expected to conclude before the completion of the feasibility study.

The Joint Venture currently has a tenement package over the proposed project development area. This tenement package includes exploration tenements, mining tenements and miscellaneous tenements. As the project progresses through feasibility and further definition is gained over the intended locations of infrastructure, exploration tenements will be transferred to either mining or miscellaneous tenements through the Western Australia Department of Mining, Industry Regulation and Safety (DMIRS).

To achieve state government approval to proceed with mining the project will require approval under Part 4 and Part 5 of the Western Australian Environment Protection Act, and under the Mining Act by way of an approved Mining Proposal. A program of work as detailed above to address the requirements of these approvals commenced in May 2018.

The environmental and regulatory study program to date represents a thorough assessment of the proposed project area in-line Western Australian regulatory requirements. To date no material environmental or approvals risks have been identified and full approval under Part 4 and Part 5 of the Western Australian Environment Protection Act, and an approved Mining Proposal under the Mining Act is expected before the end of the feasibility study and the decision to mine.

## 9. Infrastructure

West Musgrave is a greenfield site. Existing infrastructure is only sufficient for exploration work and exploration and studies personnel. While some of this existing infrastructure will remain operational during the life of the mine, additional infrastructure will be required to support mining activities.

The following infrastructure has been designed, scheduled and costed as part of the Pre-Feasibility Study:

- Site Access – Access to the site will be via public roads to the nearby community of Jameson (Mantamaru) and via a new road approximately 30km long from Jameson to site. The new road is feasible.
- Site Development and Major Civil Infrastructure – including clearing, levelling and bulk earthworks, access roads linking the various operational centres (Mine, Process Plant, Village etc.), drainage and surface runoff capture and containment, fencing and establishment of security zones.
- An aerodrome with sealed strip and associated facilities has been included and designed for up to and including Airbus A320 or equivalent aircraft.
- A nominal 50MW base case power supply is proposed utilising a hybrid diesel-solar-wind-battery solution, although a gas pipeline remains an option. Baseline data collected since 2018 has demonstrated high quality, consistent solar and wind resource is available, with higher wind velocities at night offsetting the lack of solar. The current base case assumes that power is purchased over the fence under a power purchase agreement arrangement, however the final ownership structure for the power assets will be further considered during the next phase of project development.

Modelling has demonstrated that circa 70 – 80% renewables penetration can be achieved for the site, with the current mix assumed to be an optimised mix of wind, solar and diesel supported by a battery installation. There remains considerable upside in power cost through matching plant power demand with the availability of renewable supply (load scheduling), haulage electrification to take advantage of curtailed energy and the continued improvement in the efficiency of renewable energy solutions.

- Water Supply – water for construction, mining, processing the ore and other site activities will be sourced from groundwater in the West Musgrave area. Drilling and testing have indicated the feasibility of the source. Additional drilling and testing will be required to confirm the adequacy of the groundwater supplies.
- Ore stockpiling and ROM pad reclaiming.
- Primary Crushing, secondary crushing, processing stockpiles with automated reclaim systems, grinding, classification and recycle crushing.
- Bulk Rougher flotation.
- Concentrate regrind circuits
- Two stages of cleaner flotation.
- Separation circuits for Nickel and Copper concentration.
- Nickel and Copper Concentrate thickening, filtration and storage.
- Onsite containerised concentrate will be transported via a combination of road and/or rail and/or ship depending on the customer. The concentrate logistics chain has been modelled and demonstrated to be feasible.
- Combined tailings thickening and disposal.
- A preliminary design for a paddock style Tailings Storage Facility (TSF) has been developed and shown to be feasible. An upstream raised embankment with provision for progressive downstream rock buttressing has been selected and designed based on the process tailings deposition rate of 9.94Mtpa. TSF embankment design slopes are 1V:1.5H upstream and 1V:3H downstream. It is anticipated that the starter embankment will be constructed from locally sourced material. The embankment will then be raised in stages during the life of the operation using consolidated tailings. Further geotechnical investigation and tailings characterisation test work will be required to confirm the TSF design.
- Reagent mixing, storage and distribution.
- Communications – includes all onsite communications systems and infrastructure and also the connection to the national communications network offsite inclusive of microwave link to nearby fibre, hard connected fibre and back up satellite connectivity.
- Control Systems – includes the hardware and systems required to integrate the mining, processing and other systems and the base for the operating area systems. Remote operation and monitoring facilities are included along with the traditional site operation control centre.
- Onsite Services – including reticulation of power and water around the operational centres, provision of lighting, sewage and wastewater services, fire, compressed air and dust suppression systems, waste disposal, bulk fuel receipt, storage and distribution.
- Buildings – including the provision of accommodation (750-800 during construction and then 400 permanent operational village), administration, workshops, logistics hubs, warehousing and any other non-process or mining structures.
- Fixed Plant, Mobile Equipment and Vehicles – including all other infrastructure systems and plant required for enabling site operations but not covered elsewhere in the Pre-Feasibility Study.

## JORC CODE, 2012 EDITION, TABLE 1

### Section 4 Estimation and Reporting of Ore Reserves

Criteria	Commentary												
Mineral resource estimate for conversion to Ore Reserves	<p>The JORC Mineral Resource for West Musgrave was prepared by a Competent person, Mr Mark Burdett, an employee of OZ Minerals Limited, which formed the basis of this Ore Reserve estimate.</p> <p>The details of the development of the Mineral Resource Estimate for 2020 can be found above in the Explanatory Notes which accompany the Mineral Resource estimates.</p> <p>The Indicated Mineral Resources are reported inclusive of those Mineral Resources modified to produce the Ore Reserves.</p>												
Site visits	<p>The Competent Person conducted a Site visit in September 2019. The following activities were completed:</p> <ul style="list-style-type: none"> <li>• Gained general familiarisation with the site including likely mining conditions, proposed pit location, waste dump location, site drainage and site access.</li> <li>• Assessed proposed locations of mining related infrastructure relative to the designed open pit.</li> <li>• Observed resource drilling activities.</li> <li>• Inspected core and drill hole sites to get an understanding of the variations in weathering profiles across the deposit.</li> <li>• Viewed diamond drill core from selected holes.</li> </ul>												
Study status	<p>This Ore Reserve has been supported by the completion of a Pre-Feasibility level of study (PFS), as described in JORC (2012). The PFS was completed in February 2020 and determined a technical and economical viable outcome for the West Musgrave project, inclusive of the two deposits, Babel and Nebo.</p> <p>The PFS mine plan supporting the Ore Reserve is based upon a mine plan and mine designs that are deemed technically achievable, involving the application of conventional technology.</p> <p>The mine plan has been tested for economic viability using input costs, metallurgical recovery and expected long term metal price, after due allowances for payabilities and royalties. Financial modelling completed as part of the Prefeasibility Study and Ore Reserve shows that the project is economically viable under current assumptions.</p>												
Cut-off parameters	<p>The break-even cut-off used in the Ore Reserve estimate was a Net Smelter Return (NSR) based cut-off, taking into account site processing cost (with the inclusion of General Admin, sustaining capital, corporate overhead and mine rehabilitation fund) and ore rehandle cost. Mining recovery and dilution are accounted for in the modifying factors and calculation of NSR values in the Resource model consider metallurgical recoveries.</p> <p>NSR was calculated on a block by block basis and also included royalties, concentrate payabilities, concentrate transport and penalties. A range of increased cut-off criteria was tested to determine the best project value. This resulted in using an increased cut-off to \$8/t ore above break-even cut-off.</p> <p>Mill limited break-even cut-off;  = processing cost + ore rehandle  = \$19.6/t ore</p> <p>Increased cut-off applied;  = \$19.6/t ore + \$8.0/t ore  = \$27.6/t ore</p> <p><b>Table 4: Applied cut-off</b></p> <table border="1"> <thead> <tr> <th>Item</th> <th>\$ / ore tonne</th> </tr> </thead> <tbody> <tr> <td>Ore Processing</td> <td>18.0</td> </tr> <tr> <td>Ore Rehandle</td> <td>1.6</td> </tr> <tr> <td>Increased cut-off</td> <td>8.0</td> </tr> <tr> <td>Total</td> <td>27.6</td> </tr> <tr> <td><b>Ore Cut-off (rounded up)</b></td> <td><b>28.0</b></td> </tr> </tbody> </table>	Item	\$ / ore tonne	Ore Processing	18.0	Ore Rehandle	1.6	Increased cut-off	8.0	Total	27.6	<b>Ore Cut-off (rounded up)</b>	<b>28.0</b>
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Criteria	Commentary
Mining factors or assumptions	<p>The Mineral Resource model was regularised to Selective Mining Unit (SMU) blocks of 10m E x 10m N x 5m RL to generate a diluted Mining model for mine planning tasks of pit optimisation and evaluation. The SMU block reflects expected mining equipment size, the geometry of the geology, anticipated ore loss. Mining dilution and ore loss were applied through regularisation of the resource model. The overall effect was 2.6% dilution and 4.3% ore loss applied to the mining model used for mine planning.</p> <p>The West Musgrave project considers the Babel and Nebo deposits. Both deposits are near surface and most suitable to be mined by open pit mining methods utilising conventional mining equipment. Potential underground mining was assessed, however identified higher mining cost compared to open pit extraction. Final pit and interim stage designs were completed as part of the PFS. The final pit design is the basis of the Ore Reserve estimate.</p> <p>The resource model was optimised using the Lerchs-Grossman (LG) algorithm with industry standard software. Nested pit shells were generated and tested with sensitivities on mining cost, processing cost, metal price, recoveries, and slope angles forming the basis of the optimal pit shell for the Babel and Nebo deposits. Interim pit shells provided guidance for pit stages to maximise value and achieve operational design requirements.</p> <p>The resultant pit shells were used to develop detailed pit designs with due consideration of geotechnical slope parameters, minimum mining widths, bench heights, and ramp widths suitable for proposed mining equipment. These pit designs were used as the basis for production scheduling and economic evaluation.</p> <p>A minimum mining width of 80m was applied to the final and stage pit designs.</p> <p>The mining schedule is based on realistic mining productivity and equipment utilisation estimates, and considered the pit development requirements, the selected mining fleet productivity and the vertical rate of mining development. Staged pit designs along with the stockpiling strategy were applied to ensure a continuous supply of ore whilst deferring waste mining for as long as practically possible. The mining schedule is based on supplying suitable material to the processing plant with a nameplate capacity of 10Mtpa.</p> <p>The mine was assumed it will be contractor operated during the pre-strip plus the first five years and owner operated from year six onward. The pre-strip was scheduled in the initial six-month pre-processing commissioning for waste stripping of the Babel pit and aiming for approximately 500kt Non-Pyrite-Violarite (Non-PV) ore stockpiled ready for reclamation on day one of commissioning.</p> <p>In the estimation of the Ore Reserve, Inferred Mineral Resources were excluded from pit optimisation, mine schedules and economic valuations utilised to validate the economic viability of the Ore Reserves. The Ore Reserve is technically achievable and economically viable without the inclusion of the Inferred Resource.</p> <p>Waste material from mining activities will be disposed of as follows:</p> <ul style="list-style-type: none"> <li>• Topsoil will be disposed of at designated stockpiles for application in on-going rehabilitation activities;</li> <li>• Some waste rock may be utilised to construct the Run of Mine (ROM) pad;</li> <li>• Some waste rock may be utilised to construct on-going Tailings Storage Facility (TSF) lifts;</li> <li>• Excess waste rock will be disposed of in designated engineered surface and In-pit waste dumps</li> </ul> <p>Independent peer review for dilution mining model and mining unit cots pit optimisation have been undertaken and confirmed the appropriateness of the assumptions used in the current study. Discussion with potential customers will progress during the next study stage.</p> <p>Geotechnical modelling was completed based on field logging and laboratory testing of selected diamond drill core samples from a total of ten (10) diamond cored boreholes within the pit shell, drilled for metallurgical (6 holes) and specific geotechnical engineering purposes (4 holes).</p> <p>The geotechnical slope design parameters used were based on work completed by Xextract Mining Consultants Pty Ltd. Further peer reviews on the Geotechnical report were conducted internally by OZ Minerals Principal Geotechnical. In the review, the Principal Geotechnical Engineer considered that the</p>

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	<p>development of slope design parameters is in line with industry standard. The open pit designs are based on the recommended geotechnical design parameters and assume dry slopes based on the assumption of adequate dewatering and/or depressurisation ahead of mining.</p> <p>There are various slope configurations based on the geotechnical rock domains and location in the mine schedule.</p> <p><b>Table 5: Applied Slope Designs</b></p> <table border="1" data-bbox="464 645 1452 1765"> <thead> <tr> <th>Domain</th> <th>Approximate Depth Range</th> <th>Slope Orientation</th> <th>Batter Face Angle</th> <th>Better Heights</th> <th>Berm Width at Toe</th> </tr> </thead> <tbody> <tr> <td colspan="6"><b>Babel</b></td> </tr> <tr> <td>Weathered/Oxide</td> <td>0 – 30 m</td> <td>All</td> <td>55°</td> <td>10m</td> <td>6m</td> </tr> <tr> <td rowspan="3">Transition &amp; Fresh</td> <td rowspan="3">30m to base of pit</td> <td>000 – 075</td> <td>80°</td> <td></td> <td></td> </tr> <tr> <td>075 – 165</td> <td>70°</td> <td>20m</td> <td>10m</td> </tr> <tr> <td>165 – 360</td> <td>80°</td> <td></td> <td></td> </tr> <tr> <td colspan="6"><b>Nebo</b></td> </tr> <tr> <td rowspan="2">Cover</td> <td>0 – 80m west side</td> <td>All</td> <td>45°</td> <td>10m</td> <td>5m</td> </tr> <tr> <td>0 – 40m north east and south</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td rowspan="2">Weathered/Oxide</td> <td>80 – 100m on west side</td> <td>All</td> <td>60°</td> <td></td> <td></td> </tr> <tr> <td>40 – 80m north east and south</td> <td></td> <td>55°</td> <td>20m</td> <td>10m</td> </tr> <tr> <td rowspan="3">Fresh</td> <td rowspan="3">Base oxide to base of pit</td> <td>000 – 135</td> <td>85°</td> <td></td> <td></td> </tr> <tr> <td>135 – 255</td> <td>80°</td> <td>20m</td> <td>10m</td> </tr> <tr> <td>255 – 360</td> <td>85°</td> <td></td> <td></td> </tr> </tbody> </table>	Domain	Approximate Depth Range	Slope Orientation	Batter Face Angle	Better Heights	Berm Width at Toe	<b>Babel</b>						Weathered/Oxide	0 – 30 m	All	55°	10m	6m	Transition & Fresh	30m to base of pit	000 – 075	80°			075 – 165	70°	20m	10m	165 – 360	80°			<b>Nebo</b>						Cover	0 – 80m west side	All	45°	10m	5m	0 – 40m north east and south					Weathered/Oxide	80 – 100m on west side	All	60°			40 – 80m north east and south		55°	20m	10m	Fresh	Base oxide to base of pit	000 – 135	85°			135 – 255	80°	20m	10m	255 – 360	85°		
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Metallurgical factors or assumptions	<p>The West Musgrave process facility has been designed to process nickel copper sulphide ore. The process facility utilises recognised technology for sulphide ore processing circuits and follows a processing route of:</p> <ul style="list-style-type: none"> <li>▪ Crushed ore stockpiling and reclaiming</li> <li>▪ Grinding and classification</li> <li>▪ Bulk rougher flotation</li> </ul>																																																																										

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	<ul style="list-style-type: none"> <li>▪ Rougher concentrate re-grind</li> <li>▪ Two stages of cleaner flotation</li> <li>▪ Separation circuits for copper and nickel concentrates</li> <li>▪ Copper and nickel concentrate thickening, filtration and storage</li> <li>▪ Tailings thickening and disposal.</li> </ul> <p>The grinding circuit consists of two stages of crushing followed by two parallel Vertical Roller Mills each treating nominally 5Mtpa each. The second stage of crushing and Vertical Roller Mills replace a traditional SAG Mill, Ball Mill and Pebble Crushing circuit. Vertical Roller Mills are widely used in the grinding of cement plant feeds and products, slag, coal and other industrial minerals, with thousands currently in operation worldwide, and are currently being introduced into the metals sector. The mill has benefits in reducing power consumption by 15%, no ball charge grinding media, higher flotation recovery and can be ramped up and down in response to the availability of low-cost renewable energy. The technology has been peer reviewed for West Musgrave by an independent expert and has been substantially de-risked through a series of pilot tests whereby 5 tonnes of West Musgrave ore has been tested.</p> <p>A Bulk Separation flotation flowsheet producing separate copper and nickel concentrates will be used. The flowsheet has been developed to minimise primary grinding requirements with the primary separation size at 165 microns, saving significant grinding capital and operating expenditure in terms of grinding consumables and power draw. The flowsheet uses bulk rougher flotation, regrinding, two stages of bulk cleaning, then copper nickel separation at elevated pH.</p> <p>The proposed metallurgical process is commonly used in international copper-nickel sulphide mining industry and is considered to be well-tested and proven technology. The flowsheet is employed in a number of operations in North America.</p> <p>The sulphide ore is further divided into Pyrite-Violarite (PV) and non-PV. Pyrite-Violarite ore is associated with the weathered portion of the deposits and is less amenable to flotation process, hence lower nickel recoveries are expected and are evident in these domains. The PV ore type contributes 4% of total tonnes, but its treatment in the mine plan has demonstrated a positive impact to project revenue. PV ore does however have a poisoning effect on fresh ore, reducing its nickel recovery. PV ore must be treated in separate batches. The current recovery assumption is that it will be batch treated approximately every ten weeks.</p> <p>The metallurgical recoveries used for each ore type are shown in Table 5.</p> <p><b>Table 6: Metallurgical Recoveries</b></p> <table border="1" data-bbox="464 1442 1385 1641"> <thead> <tr> <th rowspan="2">Ore Type</th> <th rowspan="2">Metal</th> <th colspan="3">Recovery%</th> </tr> <tr> <th>Ni%&gt;0.25</th> <th>0.20≤ Ni% &lt;0.25</th> <th>0.15≤ Ni% &lt;0.19</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Non-PV</td> <td>Nickel</td> <td>74.1</td> <td>60.3</td> <td>50.3</td> </tr> <tr> <td>Copper</td> <td>79.4</td> <td>73.9</td> <td>65.9</td> </tr> <tr> <td rowspan="2">PV</td> <td>Nickel</td> <td>32.5</td> <td>26.6</td> <td>20.1</td> </tr> <tr> <td>Copper</td> <td>71.3</td> <td>66.6</td> <td>59.1</td> </tr> </tbody> </table> <p>Metallurgical test work was conducted on 40 representative samples from diamond drill holes. The selected samples were representative of ore type domaining in Nebo Babel deposits and grade variability for various points of time over the life of mine from the previous study stage of mine plan. The test work has demonstrated that a typical metallurgical crushing, grinding and flotation process would produce acceptable grades and metal recoveries for separate copper and nickel flotation concentrate streams.</p> <p>Bench test work conducted to enable the development of the process design criteria for the specification of the process plant included;</p> <ul style="list-style-type: none"> <li>• 40 comminution tests.</li> <li>• 350 flotation tests, including locked cycle testing.</li> <li>• Regrinding, thickening and filtration tests.</li> </ul>	Ore Type	Metal	Recovery%			Ni%>0.25	0.20≤ Ni% <0.25	0.15≤ Ni% <0.19	Non-PV	Nickel	74.1	60.3	50.3	Copper	79.4	73.9	65.9	PV	Nickel	32.5	26.6	20.1	Copper	71.3	66.6	59.1
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	<ul style="list-style-type: none"> <li>Extensive mineralogy.</li> </ul> <p>The locked cycle testing for flotation confirmed the metal recoveries and concentrate grades of all elements used in the Pre-Feasibility Study. Resultant key metallurgical recoveries used were ~69% for nickel and ~78% for copper with concentrate grades of ~10% for nickel and ~25% for copper. The economic analysis of West Musgrave in Ore Reserve Optimisation used these metallurgical factors.</p> <p>Test work has demonstrated that potential penalty elements report to the flotation concentrate at levels that do not trigger any marketing penalty payments.</p> <p>Pilot plant bulk samples for additional comminution test work were collected from holes drilled specifically for metallurgical test work to be characteristic of the ore body in terms of grades and mineralogy.</p> <p>Pilot plant operation confirmed the process design criteria which were used for the specification of the processing plant.</p> <p>Once full production is established at West Musgrave, ore will be mined continuously across the entire footprint of the orebody. The mine will produce a blend of the various metallurgical domains. There is reasonable metallurgical variability between the domains however the mine schedule will provide reduced variability.</p>
Environmental	<p>The West Musgrave Project spans two Bioregions; the Central Ranges and the Great Victoria Desert. The northern half of the Project Area is in the Mann-Musgrave Block subregion of the Central Ranges Bioregion, which is dominated by ranges interspersed with sandplains (Graham and Cowan 2001). The southern part of the West Musgrave Project is within the Great Victoria Desert Central subregion of the Great Victoria Desert Bioregion. This subregion comprises extensive sandplains and dune fields, salt lakes, minor hills and breakaways (Barton and Cowan 2001).</p> <p>A series of environmental baseline studies commenced in May 2018 with the aim of characterising the existing environment and identifying any associated project and approvals risks. The baseline environmental program has included an assessment of flora and vegetation, landforms, subterranean fauna, terrestrial environmental quality (including both mineralised and non-mineralised waste), terrestrial fauna, inland waters, air quality, heritage, archaeology, social surrounds and human health. The baseline program will continue until around March 2020 around which time the project will be referred to the Western Australia EPA under Section 38 of the Environment Protection Act. This referral program represents the first primary approval under the Western Australian Government.</p> <p>The study program to date represent a thorough assessment of the proposed project area in-line with the requirements of the Western Australian EPA guidelines. To date no material environmental or approvals risks have been identified.</p> <p>A program of materials characterisation has occurred to classify potentially problematic mineralised waste rock. The materials characterisation has included both static and kinetic testing of various waste rock lithologies. To date, results indicate that waste rock material with potential acid forming (PAF) represents only a small portion of the overall waste rock generation and will be encapsulated in accordance with Western Australian requirements within onsite waste rock dumps. All waste rock dumps will be designed in accordance with Western Australian requirements and approvals conditions.</p> <p>A PFS level program to confirm water supply was carried out throughout 2019. The program included the drilling and pumping of 13 dedicated water bores. These bores were pump tested to test specific parameters about the availability of groundwater supply within this system. A model to confirm the confidence in water supply and associated impacts was developed. The model used a combination of data to develop a robust model. The model inputs included, field data; text book/benchmark values for similar systems, sensitivity ranging and modelling and an independent third party peer review.</p> <p>The study concluded that the model for local aquifer system has enough supply to support the anticipated water requirements of the project, and that water quality meets the project specifications. Further testing will occur throughout the feasibility study to validate the findings of the PFS water supply study.</p>



Criteria	Commentary
Infrastructure	<p>West Musgrave is a greenfield site. Existing infrastructure is only sufficient for exploration work and exploration and studies personnel. While some of this existing infrastructure will remain operational during the life of the mine, additional infrastructure will be required to support mining activities.</p> <p>The following infrastructure has been designed, scheduled and costed as part of the Pre-Feasibility Study:</p> <ul style="list-style-type: none"> <li>• Site Access – Access to the site will be via public roads to the nearby community of Jameson (Mantamaru) and via a new road approximately 30km long from Jameson to site. The new road has been shown to be feasible.</li> <li>• Site Development and Major Civil Infrastructure – including clearing, levelling and bulk earthworks, access roads linking the various operational centres (Mine, Process Plant, Village etc.), drainage and surface runoff capture and containment, fencing and establishment of security zones.</li> <li>• An aerodrome with sealed strip and associated facilities has been included and designed for up to and including Airbus A320 or equivalent aircraft.</li> <li>• A nominal 50MW base case power supply is proposed utilising a hybrid diesel-solar-wind-battery solution, although a gas pipeline remains an option. Baseline data collected since 2018 has demonstrated high quality, consistent solar and wind resource is available, with higher wind velocities at night offsetting the lack of solar. The current base case assumes that power is purchased over the fence under a power purchase agreement arrangement, however the final ownership structure for the power assets will be further considered during the next phase of project development.</li> </ul> <p>Modelling has demonstrated that circa 70 – 80% renewables penetration can be achieved for the site, with the current mix assumed to be an optimised mix of wind, solar and diesel supported by a battery installation. There remains considerable upside in power cost through matching plant power demand with the availability of renewable supply (load scheduling), haulage electrification to take advantage of curtailed energy and the continued improvement in the efficiency of renewable energy solutions.</p> <ul style="list-style-type: none"> <li>• Water Supply – water for construction, mining, processing the ore and other site activities will be sourced from groundwater in the West Musgrave area. Drilling and testing have indicated the feasibility of the source. Additional drilling and testing will be required to confirm the adequacy of the groundwater supplies.</li> <li>• Ore stockpiling and ROM pad reclaiming.</li> <li>• Primary Crushing, secondary crushing, processing stockpiles with automated reclaim systems, Grinding, classification and recycle crushing.</li> <li>• Bulk Rougher flotation.</li> <li>• Concentrate regrind circuits</li> <li>• Two stages of cleaner flotation.</li> <li>• Separation circuits for Nickel and Copper Concentrate</li> <li>• Nickel and Copper Concentrate thickening, filtration and storage.</li> <li>• Onsite containerised concentrate will be transported via a combination of road and/or rail and/or ship depending on the customer. The concentrate logistics chain has been modelled and demonstrated to be feasible.</li> <li>• Combined tailings thickening and disposal.</li> <li>• A preliminary design for a paddock style Tailings Storage Facility (TSF) has been developed and shown to be feasible. An upstream raised embankment with provision for progressive downstream rock buttressing has been selected and designed based on the process tailings deposition rate of 9.94Mtpa. TSF embankment design slopes are 1V:1.5H upstream and 1V:3H downstream. It is anticipated that the starter embankment will be constructed from locally sourced material. The embankment will then be raised in stages during the life of the operation using consolidated tailings. Further geotechnical investigation and tailings characterisation test work will be required to confirm the TSF design.</li> <li>• Reagent mixing, storage and distribution.</li> <li>• Communications – includes all onsite communications systems and infrastructure and also the connection to the national communications network offsite inclusive of microwave link to nearby fibre, hard connected fibre and back up satellite connectivity</li> </ul>

Criteria	Commentary
	<ul style="list-style-type: none"> <li>• Control Systems – includes the hardware and systems required to integrate the mining, processing and other systems and the base for the operating area systems. Remote operation and monitoring facilities are included along with a traditional site operation control centre.</li> <li>• Onsite Services – including reticulation of power and water around the operational centres, provision of lighting, sewage and wastewater services, fire, compressed air and dust suppression systems, waste disposal, bulk fuel receipt, storage and distribution.</li> <li>• Buildings – including the provision of accommodation (750-800 during construction and 400 permanent village), administration, workshops, logistics hubs, warehousing and any other non-process or mining structures.</li> <li>• Fixed Plant, Mobile Equipment and Vehicles – including all other infrastructure systems and plant required for enabling site operations but not covered elsewhere in the Pre-Feasibility Study.</li> </ul>
Costs	<p><b>MINING COST</b>          The Ore Reserve has been supported by sourcing mining CAPEX costs from original equipment manufacturers (OEM)s for the proposed mining fleet, and mining OPEX was estimated from a first principle cost model and mine schedule physicals. Equipment hours and requirements were estimated from haul cycles, production rates, availabilities and utilisation. Operational and maintenance labour was estimated from equipment hours.          The mine was assumed to be contractor operated during the pre-strip plus the first five years and followed by owner operated from year six onward.</p> <p><b>PROCESSING AND INFRASTRUCTURE CAPITAL COST</b>          The processing plant and infrastructure capital estimate including surface mining infrastructure were estimated as follows:</p> <ul style="list-style-type: none"> <li>• The construction capital cost estimate is compiled to a consistent and uniform structure for the various purposes to which the outputs are used. These structures include:             <ul style="list-style-type: none"> <li>○ Cost components (e.g. materials, plant, labour, consumables and services),</li> <li>○ All site labour hours to be quantified,</li> <li>○ Work Breakdown Structure (facility codes),</li> <li>○ Code of accounts (commodity codes),</li> <li>○ Foreign currency,</li> <li>○ Categorise basis of pricing,</li> <li>○ Categorise basis of quantification,</li> <li>○ Time-phasing for the financial model.</li> </ul>             The estimated accuracy is considered -25% / +25%,              All pricing in the capital estimate has been aligned with or obtained in the 4th quarter of 2019 (4Q19)           </li> <li>• Earthworks             <ul style="list-style-type: none"> <li>○ The project earthworks quantities have been developed from first principals using on ground and obtained information from the site.</li> <li>○ Earthworks quantities are directly related to the final location of the plant and infrastructure.</li> </ul> </li> <li>• Concrete and structural             <ul style="list-style-type: none"> <li>○ The quantities for the process plant have been developed according to the mechanical equipment to be installed.</li> <li>○ Quantities for plant services, infrastructure and other minor areas have been developed from layout drawings based on the requirements adopting standard practice for those areas.</li> </ul> </li> <li>• Mechanical, Plate and Tanks             <ul style="list-style-type: none"> <li>○ The process design criteria developed determined the mechanical, plate and tank quantities and requirements.</li> <li>○ Engineering take-offs were completed for plate and tanks, the total developed quantities were benchmarked against known quantities on past projects and studies.</li> </ul> </li> <li>• Piping             <ul style="list-style-type: none"> <li>○ Quantities for the plant piping were not developed for the estimate with the total costs factored as a percentage of the process plant costs based on past project costs.</li> <li>○ Overland piping requirements were estimated from first principals following engineering design.</li> </ul> </li> <li>• Electrical, Instrumentation and Control</li> </ul>

Criteria	Commentary
	<ul style="list-style-type: none"> <li>○ The electrical requirements were estimated from first principals based on single line diagrams, layouts and the equipment to be installed.</li> <li>○ Overland powerline requirements were determined following engineering design.</li> <li>• Buildings and Infrastructure               <ul style="list-style-type: none"> <li>○ The building and infrastructure requirements have been developed to OZ Minerals specifications.</li> <li>○ Market enquiries were sent out for camps, transportable buildings and shed structures. Returned budget pricing was evaluated and the most suitable pricing selected for the project estimate.</li> <li>○ Infrastructure costs for fuel farms, fuel tanks, waste and potable water plants have been quoted.</li> <li>○ Wash-down facilities and weighbridge costs were obtained recently on other projects with the same requirements.</li> </ul> </li> <li>• Transport               <ul style="list-style-type: none"> <li>○ Transport requirements are determined by the source and quantity of the delivered goods.</li> <li>○ The freight costs are determined by line item based on the dimensions and the source of the item.</li> <li>○ International freight is included in the estimate.</li> <li>○ Freight rates were obtained for the project for various dimension loads primarily from Perth metro to the project site.</li> </ul> </li> <li>• Installation               <ul style="list-style-type: none"> <li>○ Estimates for installation labour costs were based on estimated man-hours associated with installation in each area of the plant and the application of industry standard labour rates for the type of work involved.</li> <li>○ The construction working roster is 3 on 1 off.</li> </ul> </li> <li>• Mechanical               <ul style="list-style-type: none"> <li>○ Budget quotes were obtained from the market for the following:                   <ul style="list-style-type: none"> <li>▪ Crushers (gyro and cone);</li> <li>▪ Grinding Mills;</li> <li>▪ Flotation Cells;</li> <li>▪ Re grind Mills;</li> <li>▪ Filters;</li> <li>▪ Compressors and Blowers;</li> <li>▪ Major pumps;</li> <li>▪ Thickener;</li> <li>▪ Water Treatment Plant;</li> <li>▪ Fuel Farm.</li> </ul> </li> <li>○ Budget quotes account for approximately 84% of the mechanical supply costs.</li> <li>○ Database pricing accounts for 12% of the mechanical costs and the remaining 4% of costs are estimated or allowance.</li> </ul> </li> <li>• Electrical, Instrumentation and Control               <ul style="list-style-type: none"> <li>○ Budget quotes were obtained from the market for the following:                   <ul style="list-style-type: none"> <li>▪ Transformers;</li> <li>▪ 11kV switchgear;</li> <li>▪ 33kV switchgear;</li> <li>▪ Low voltage VSD;</li> <li>▪ Med. Voltage VSD;</li> </ul> </li> <li>○ Budget quotes account for approximately 62% of the electrical material costs.</li> <li>○ Database pricing accounts for the balance of electrical material costs.</li> </ul> </li> </ul> <p>Capital cost has incorporated appropriate contingencies for inherent risks (uncertainty due to estimate immaturity) and for contingent risks that may eventuate during construction.</p> <p><b>PROCESSING AND INFRASTRUCTURE OPERATING COST</b></p> <ul style="list-style-type: none"> <li>▪ Labour costs were based on developed staffing and operational configurations and used OZ Minerals base rates from existing labour agreements.</li> <li>▪ Power, fuel, reagent and consumables costs were based on budget quotations.</li> </ul>

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	<ul style="list-style-type: none"> <li>▪ Process plant and surface infrastructure maintenance materials costs were calculated from benchmark data.</li> <li>▪ Pre-production operating costs were capitalised.</li> <li>▪ Sustaining capital costs are included in operating costs.</li> <li>▪ Processing plant operating costs were developed from first principles by GR Engineering and OZ Minerals.</li> </ul> <p>OTHERS</p> <ul style="list-style-type: none"> <li>▪ Royalties were applied in the LG pit optimisation and cashflow evaluation. These included:               <ul style="list-style-type: none"> <li>○ Nickel royalty 2.5%</li> <li>○ Copper sold as concentrate royalty 5%</li> <li>○ Copper sold as Ni by-product royalty 2.5%</li> <li>○ Cobalt sold in Ni concentrate royalty 2.5%</li> <li>○ Gold royalty 2.5%</li> <li>○ Silver royalty 2.5%</li> <li>○ Platinoids royalty 2.5%</li> <li>○ Project Nets Smelter Return royalty 2.0%</li> <li>○ Native Title royalty</li> </ul> </li> </ul> <p>The assumption for Native Title royalty was taken into consideration in the evaluation. The assumption was based on the benchmarking against similar projects and currently is still under negotiation.</p> <ul style="list-style-type: none"> <li>▪ The closure cost estimate was developed following the Western Australia Mining Rehabilitation Fund Regulation 2013 and was estimated on the basis of the area disturbance indicated in the mine planning. The estimation is subject to further refinement in the next stage of study.</li> </ul>																														
Revenue factors	<p>The Ore Reserve estimates are based on the life-of-mine (LOM) economic parameters. These parameters are shown in Table 7 and are drawn from OZ Minerals Corporate Economic Assumptions released in Quarter 3, October 2019 and are the consensus values of major brokers.</p> <p><b>Table 7: West Musgrave Ore Reserve Optimisation Economic Assumptions</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Parameter</th> <th style="text-align: left;">Units</th> <th style="text-align: left;">LOM</th> </tr> </thead> <tbody> <tr> <td>Nickel</td> <td>US \$ / lb</td> <td>7.16</td> </tr> <tr> <td>Copper</td> <td>US \$ / lb</td> <td>2.94</td> </tr> <tr> <td>Gold</td> <td>US \$ / oz</td> <td>1,246</td> </tr> <tr> <td>Silver</td> <td>US \$ / oz</td> <td>17.19</td> </tr> <tr> <td>Platinum</td> <td>US \$ / oz</td> <td>1,311</td> </tr> <tr> <td>Palladium</td> <td>US \$ / oz</td> <td>633</td> </tr> <tr> <td>Cobalt</td> <td>US \$ / lb</td> <td>21.90</td> </tr> <tr> <td>Exchange Rate</td> <td>AUD / USD</td> <td>0.73</td> </tr> <tr> <td>Discount Rate</td> <td>%</td> <td>8.5</td> </tr> </tbody> </table>	Parameter	Units	LOM	Nickel	US \$ / lb	7.16	Copper	US \$ / lb	2.94	Gold	US \$ / oz	1,246	Silver	US \$ / oz	17.19	Platinum	US \$ / oz	1,311	Palladium	US \$ / oz	633	Cobalt	US \$ / lb	21.90	Exchange Rate	AUD / USD	0.73	Discount Rate	%	8.5
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Market assessment	<p>Copper concentrates are modelled to be sold on the open concentrate market to a range of overseas smelters.</p> <p>Nickel concentrates are modelled to be sold on the open concentrate market to either overseas or domestic smelters. Nickel payability in concentrate from PV ore is relatively lower than payability from non-PV ore. Based on the current mine planning, the Nickel concentrate from PV ore accounts for approximately less than five percent of total nickel concentrate.</p> <p>The cost of sales includes costs from mine to the customer, smelter treatment and refining charges. The smelter treatment and refining charges are typically negotiated on an annual basis directly with customers at industry benchmark terms.</p> <p>The Ore Reserve estimate optimisation uses assumptions shown in Table 8 to estimate revenue.</p>																														

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	<p><b>Table 8: Transports, Payabilities and Smelter Charges Assumptions</b></p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Units</th> <th>LOM</th> <th>Non-PV</th> <th>PV</th> </tr> </thead> <tbody> <tr> <td colspan="5"><u>Nickel Concentrate:</u></td> </tr> <tr> <td>- Transport to International market</td> <td>AU \$ / wmt</td> <td>221</td> <td></td> <td></td> </tr> <tr> <td>- Transport to Domestic market</td> <td>AU \$ / wmt</td> <td>98</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td><b>Non-PV</b></td> <td><b>PV</b></td> </tr> <tr> <td>- Nickel Payability</td> <td>%</td> <td></td> <td>71</td> <td>67</td> </tr> <tr> <td>- Copper Payability</td> <td>%</td> <td></td> <td>12.5</td> <td>0</td> </tr> <tr> <td>- Cobalt Payability</td> <td>%</td> <td></td> <td>12.5</td> <td>0</td> </tr> <tr> <td>- Palladium Payability</td> <td>%</td> <td></td> <td>12.5</td> <td>40</td> </tr> <tr> <td>- Platinum Payability</td> <td>%</td> <td></td> <td>12.5</td> <td>0</td> </tr> <tr> <td colspan="5"><u>Copper Concentrate:</u></td> </tr> <tr> <td>- Transport for International market</td> <td>AU \$ / wmt</td> <td>221</td> <td></td> <td></td> </tr> <tr> <td>- Copper Payability</td> <td>%</td> <td>96.5</td> <td></td> <td></td> </tr> <tr> <td>- Copper Concentrate Smelting</td> <td>US \$ / dmt</td> <td>85</td> <td></td> <td></td> </tr> <tr> <td>- Copper Refining</td> <td>US \$ / lb</td> <td>0.085</td> <td></td> <td></td> </tr> <tr> <td>- Gold Refining</td> <td>US \$ / oz</td> <td>5</td> <td></td> <td></td> </tr> <tr> <td>- Silver Refining</td> <td>US \$ / oz</td> <td>0.5</td> <td></td> <td></td> </tr> </tbody> </table> <p>An independent peer review of the market terms has been undertaken and confirmed the appropriateness of the assumptions used in the current study. Discussion with potential customers will progress during the next study stage.</p>	Parameter	Units	LOM	Non-PV	PV	<u>Nickel Concentrate:</u>					- Transport to International market	AU \$ / wmt	221			- Transport to Domestic market	AU \$ / wmt	98						<b>Non-PV</b>	<b>PV</b>	- Nickel Payability	%		71	67	- Copper Payability	%		12.5	0	- Cobalt Payability	%		12.5	0	- Palladium Payability	%		12.5	40	- Platinum Payability	%		12.5	0	<u>Copper Concentrate:</u>					- Transport for International market	AU \$ / wmt	221			- Copper Payability	%	96.5			- Copper Concentrate Smelting	US \$ / dmt	85			- Copper Refining	US \$ / lb	0.085			- Gold Refining	US \$ / oz	5			- Silver Refining	US \$ / oz	0.5		
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Economic	<p>Gross revenue was estimated based on production schedule yearly quantities, grades and metallurgical recoveries, at a constant long-term metal price. The mine production schedule input to the model was drawn from the Pre-Feasibility Study. Capital and operating costs input to the model were at a prefeasibility level of accuracy.</p> <p>West Musgrave is an economically robust project, generating a positive NPV and IRR as reported in the Pre-Feasibility Study.</p> <p>Sensitivity analyses were carried out on commodity prices, exchange rate, capital cost and operating cost. The results suggested that the project was most sensitive to nickel prices and exchange rate on the upside and downside cases. For all sensitivity scenarios modelled project NPV remained positive.</p> <p>The Ore Reserve estimate is based on OZL Q3 2019 of Life of Mine (LOM) economic assumptions generating a positive economic outcome. PFS financial modelling has since been updated using OZL Q4 2019 LOM economic assumptions (i.e. as of November 2019) with an increase Nickel price of 15% and Copper of 8% in Australian dollar term relative to Q3 assumptions. The Q4 assumptions is shown in Table 9.</p> <p><b>Table 9: LOM Economic Assumptions for Pre-Feasibility Study Economic Analysis</b></p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Units</th> <th>Q4 LOM</th> </tr> </thead> <tbody> <tr> <td>Nickel</td> <td>US \$ / lb</td> <td>7.60</td> </tr> <tr> <td>Copper</td> <td>US \$ / lb</td> <td>2.91</td> </tr> <tr> <td>Gold</td> <td>US \$ / oz</td> <td>1,246</td> </tr> <tr> <td>Silver</td> <td>US \$ / oz</td> <td>17.19</td> </tr> <tr> <td>Platinum</td> <td>US \$ / oz</td> <td>1,311</td> </tr> <tr> <td>Palladium</td> <td>US \$ / oz</td> <td>633</td> </tr> <tr> <td>Cobalt</td> <td>US \$ / lb</td> <td>21.90</td> </tr> <tr> <td>Exchange Rate</td> <td>AUD / USD</td> <td>0.67</td> </tr> </tbody> </table>	Parameter	Units	Q4 LOM	Nickel	US \$ / lb	7.60	Copper	US \$ / lb	2.91	Gold	US \$ / oz	1,246	Silver	US \$ / oz	17.19	Platinum	US \$ / oz	1,311	Palladium	US \$ / oz	633	Cobalt	US \$ / lb	21.90	Exchange Rate	AUD / USD	0.67																																																										
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	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; border-bottom: 1px solid black;">Discount Rate</td> <td style="width: 10%; border-bottom: 1px solid black;">%</td> <td style="width: 60%; border-bottom: 1px solid black; text-align: right;">8.5</td> </tr> </table> <p>Minor elements such as Gold, Silver, Platinum, Palladium and Cobalt are payable with a combined revenue less than five percent of total project revenue.</p>	Discount Rate	%	8.5
Discount Rate	%	8.5		
Social	<p>The proposed project area is fully encompassed within two types of indigenous title, these include Native Title under Commonwealth law and Aboriginal Reserve under Western Australian law. To enable the project to proceed, an agreement must be negotiated with the title holders, the Yarnangu People who are represented by the Ngaanyatjarra Council Aboriginal Corporation.</p> <p>Two project related Native Titles were determined for the area in 2005 and in 2008. An Indigenous Land Use Agreement (ILUA) was established in 2005. The Joint Venture currently have a deed of agreement over the proposed project development area with the Traditional Owners for the purpose of Exploration with provisions for this agreement to become a mining agreement subject to the negotiation of methods for mining and compensation.</p> <p>The Joint Venture has developed and maintained a close relationship with the Traditional Owners and has ensured that the community have been involved in the ongoing development of the project. A program of consultation for mining agreement-making is currently ongoing and negotiations will occur throughout 2020. The mining agreement-making process is expected to conclude prior to the completion of the feasibility study. The Traditional Owners are highly supportive of the project to commence. The Joint Venture has no reason to believe that agreement will not be achieved before the completion of the feasibility study.</p> <p>A social impact and opportunity assessment (SIOA) has been co-designed with the Ngaanyatjarra Council Aboriginal Corporation and the University of Queensland (Centre for Social Responsibility in Mining Sustainable Minerals Institute). The SIOA will be undertaken in 2020 and will form a quantitative baseline dataset to help inform decision-making for social programming and investment opportunities.</p>			
Other	<p>A program of work relating to tenement security, land access and regulatory approvals has been ongoing since May 2018 and expected to conclude before the completion of the feasibility study.</p> <p>The Joint Venture currently has a tenement package over the proposed project development area. This tenement package includes exploration tenements, mining tenements and miscellaneous tenements. As the project progresses through feasibility and further definition is gained over the intended locations of infrastructure, exploration tenements will be transferred to either mining or miscellaneous tenements through the Western Australia Department of Mining, Industry Regulation and Safety (DMIRS).</p> <p>To achieve state government approval to proceed with mining the project will require approval under Part 4 and Part 5 of the Western Australian Environment Protection Act, and under the Mining Act by way of an approved Mining Proposal. A program of work as detailed above to address the requirements of these approvals commenced in May 2018.</p> <p>The environmental and regulatory study program to date represent a thorough assessment of the proposed project area in-line Western Australian regulatory requirements. To date no material environmental or approvals risks have been identified and full approval under Part 4 and Part 5 of the Western Australian Environment Protection Act, and an approved Mining Proposal under the Mining Act is expected before the end of the feasibility study and the decision to mine.</p> <p>The project financial outcomes are mostly sensitive to the exchange rate. However, an increase to 20% exchange rate is still maintained project NPV in positive territory.</p> <p>Change in metal prices, exchange rate and to a lesser extent operating cost and pit design parameters in the pit optimisation, can either increase or decrease the pit size and associated ore reserve. Further refinement is expected during the next phase of the study.</p>			

Criteria	Commentary
	<p>OZ Minerals feels that approvals risks are manageable and is targeting a regulatory approvals schedule that aligns with the project study phase, it is recognised that an approval delay of up to 12 months still presents a risk. Delay to Regulatory approval is not deemed material.</p> <p>Benchmarking several regulatory approvals programs in Western Australia (including; Western Australia Environment Protection Act Part 4, Part 5 and Western Australia Mining Act, Mining Proposal) the range to which projects have been shown to achieve all project approvals is between 18 months, and 40 months for highly complex projects (from the time of initial referral to receipt of all project approvals).</p>
Classification	<p>The main basis of classification of Ore Reserves is the underlying Mineral Resource classification. All Probable Ore Reserves have been derived from Indicated Mineral Resources in accordance with JORC Code (2012) guidelines.</p> <p>The Ore Reserve classification reflects the Competent Persons' view of the deposits.</p> <p>No Inferred Mineral Resource is included in the Ore Reserves.</p>
Audits or reviews	<p>Mining One has reviewed the Pre-Feasibility Study work and find no fatal flaws. The Probable Ore Reserve classification conforms to the requirements of the Australasian Code for Reporting of Identified Mineral Resources and Ore Reserves, published by the Joint Ore Reserves Committee (JORC) of the Australasian Institute of Mining and Metallurgy (2012). OZ has used internal and independent third-party peer review extensively throughout the study, which is to be commended as a risk mitigation process.</p>
Discussion of relative accuracy/ confidence	<p>The Ore Reserve estimate is based on 100 percent Probable Reserves.</p> <p>In the opinion of the Competent Person, the Ore Reserve estimate is supported by appropriate design, scheduling, and costing work reported to a Pre-Feasibility Study level of detail. Cost assumptions and modifying factors applied in the process of estimating Ore Reserves are reasonable. These are subject to further refinement in additional studies and may influence the accuracy of the Ore Reserve.</p> <p>Metal price and exchange rate assumptions were set out by OZ Minerals and are subject to market forces and therefore present an area of uncertainty.</p> <p>In the opinion of the Competent Person, there are reasonable prospects to anticipate that all relevant legal, environmental and social approvals to operate will be granted within the project timeframe.</p>

## Competent Person's Statement

The information in this report that relates to Ore Reserves is based on and fairly represents information and supporting documentation compiled by Yohanes Sitorus BEng (Min), a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM Membership No. 317702).

Yohanes Sitorus is a full-time employee of OZ Minerals Limited. Yohanes Sitorus is a shareholder in OZ Minerals Limited and is entitled to participate in the OZ Minerals Performance Rights plan.

Yohanes Sitorus has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activities 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). Yohanes Sitorus consents to the inclusion in the report of the matters based on his information in the form and context in which they appear.

The Ore Reserve estimates have been compiled in accordance with the guidelines defined in the JORC Code.

**Yohanes Sitorus**  
**Lead Mining Engineer**  
**West Musgrave**  
**OZ Minerals Limited**

## Contributors

- Overall
  - Yohanes Sitorus - OZ Minerals Limited
- Mineral Resource Model
  - Mark Burdett - OZ Minerals Limited
- Mine Planning
  - AMC Consultants Pty Ltd
  - Yohanes Sitorus - OZ Minerals Limited
- Non-mining Modifying Factors
  - James Hodgkinson for Social and Community- OZ Minerals Limited
  - Mark Weidenbach for Metallurgical Factors - OZ Minerals Limited
  - Stephen Blackman for Infrastructure and Processing - OZ Minerals Limited
  - Travis Beinke for Marketing and Economic Assumptions - OZ Minerals Limited
  - Justin Rowntree for Environment and Approvals - OZ Minerals Limited
  - Anthony Wright for Tailings Storage Facility and Logistic - OZ Minerals Limited

Yohanes Sitorus is responsible for the Ore Reserve estimates in this Report but has relied on, checked and reviewed supporting information and documentation provided by AMC Consultants Pty Ltd.



