



# MT THIRSTY NORTH MAIDEN MINERAL RESOURCE

## HIGHLIGHTS

- Maiden Inferred JORC 2012 Mineral Resource estimated for Mt Thirsty North of 1.5 Mdt @ 0.092% cobalt, 0.55% nickel
- Mt Thirsty North Cobalt-Nickel Deposit located only 3km north from the main deposit
- Total Mt Thirsty Mineral Resource owned by MTJV now stands at 26.6Mdt @ 0.113% cobalt and 0.52% nickel:

	Mineral Resource	Dry Tonnes (Mdt)	Co (%)	Ni (%)
Mt Thirsty main <sup>1</sup>	Indicated	22.6	0.116	0.53
	Inferred	2.5	0.099	0.44
Mt Thirsty North	Inferred	1.5	0.092	0.55
<b>Total</b>	Ind. & Inf.	26.6	0.113	0.52

Table 1 – Mt Thirsty Mineral Resource Summary (0.06% Co cut off)

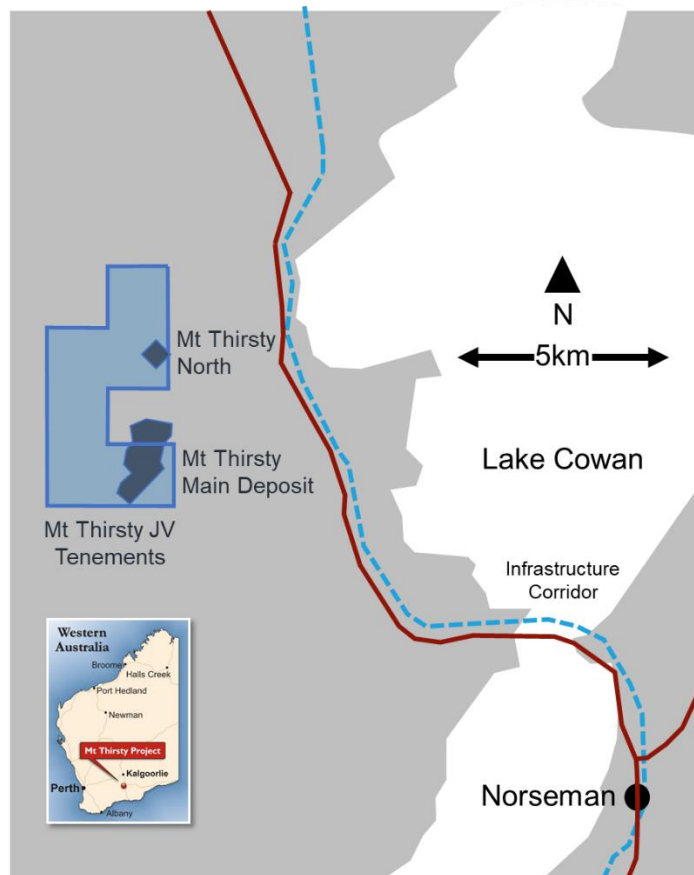


Figure 1 – Mt Thirsty Project location

## ASX ANNOUNCEMENT

12<sup>th</sup> April 2019

## BARRA RESOURCES LIMITED

A.B.N. 76 093 396 859

### Corporate Details:

ASX Code: BAR  
 Market Cap: \$15.4M @ 2.9c  
 Cash: \$2.3M (Dec)

### Issued Capital:

530.89M Ordinary Shares  
 50M Options

### Substantial Shareholders:

FMR Investments 15.4%  
 Mineral Resources Ltd 10.8%

## DIRECTORS

MD & CEO: Sean Gregory  
 Chairman: Gary Berrell  
 Non-Exec: Jon Young  
 Non-Exec: Grant Mooney

## PROJECTS

Mt Thirsty Co-Ni (50%)  
 Coolgardie Au (100%)

## CONTACT DETAILS

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 West Perth, WA 6005



## Introduction

The Mt Thirsty Cobalt-Nickel Project is located 16km northwest of Norseman, Western Australia. (Figure 1).

The project is jointly owned by Barra Resources Limited and Conico Limited, together the Mt Thirsty Joint Venture (MTJV).

The Project contains the Mt Thirsty Cobalt-Nickel Oxide Deposits and has the potential to emerge as Australia's next cobalt producer.

The MTJV is progressing a Pre-Feasibility Study (PFS) on the project.

## Geology and Geological Interpretation

The Mt Thirsty North Cobalt-Nickel Deposit is of similar style to the main Mt Thirsty Cobalt-Nickel Deposit, 3km to the south. The Mt Thirsty North Deposit is situated beneath a laterite capped ridge and is hosted in strongly weathered ultramafic peridotite rocks between a sediment-ultramafic-basalt sequence to the west and a thick gabbro-pyroxenite unit to the east. Weathering and supergene enrichment processes have produced the secondary deposit which is enriched in cobalt, nickel and manganese.

The mineralisation is relatively flat lying but varies from almost outcropping to greater than 20m below surface. Immediately below the laterite, goethitic clays are present with an iron content of around 30% (Goethitic Upper Saprolite Domain or RSGo domain). Further down, the goethitic iron oxide colouring diminishes with greenish nontronite and serpentine minerals becoming dominant (Nontronitic Lower Saprolite Domain or RSno domain). The transition from the brownish completely oxidised goethitic upper saprolite to the greenish partly oxidised lower nontronitic saprolite corresponds to a decrease in iron content and a sharp increase in magnesium content. Variably, spanning the boundary between the upper RSGo domain and lower RSno domain, elevated manganese is present as the RSmn domain. At the main Mt Thirsty deposit the RSmn domain is commonly associated with the upper saprolite and at Mt Thirsty North, the RSmn is more commonly associated with the lower saprolite.

## Drilling Techniques

45 air core (AC) drill holes have been drilled at the Mt Thirsty North Deposit; 14 reconnaissance holes in 2015 and 31 resource definition holes in 2017 (MTAC751-796). No additional Reverse Circulation (RC) or Sonic Core (SC) holes were drilled at Mt Thirsty North.

A comparison of the analytical results from twin AC, RC and SC holes at the nearby main Mt Thirsty deposit was completed. Differences are noted between the various drilling types and are most likely due to sample size and short-scale geological variability inherent in laterite deposits. Analysis of population statistics showed that the AC method is slightly conservative compared to RC and SC drilling results.

## Sampling and Sub-Sampling Techniques

Drill hole cuttings were collected in a cyclone, and subsequently reduced in volume with a riffle splitter by hand. The cyclone was cleaned between each three-metre rod and riffle splitters were cleaned as required. Water injection was not used and there were no wet samples. The 2015 holes were sampled at 3-5m intervals and the 2017 holes were sampled at regular 1m intervals.

## Classification Criteria

Drill hole spacing is generally 40mE x 100mN, with some holes at 40mE x 50mN in the centre of the deposit. This is considered to be more than sufficient to establish the degree of geological and grade continuity for Inferred Mineral Resource classification at Mt Thirsty North. Density, moisture,



variography, drilling technique twinning and metallurgical performance has been assumed to be similar to the Mt Thirsty main deposit based on the similar mineralisation style. Additional work in at least some of these areas would be required to achieved higher classifications.

The Mineral Resource extent was only limited to the east by the tenement boundary and remains open in other directions, although it does appear to be thinning at the margins of the drilling. Inferred Mineral Resources were extrapolated 80m to the west and 100m to the north and south of the last line of drill holes.

### Sample Analysis Method

Samples were crushed and pulverised, and analysed for Co, Ni, Mn, Mg, Al & Fe using a four-acid digest with an ICP-OES finish by Bureau Veritas' Perth laboratory. These procedures are considered appropriate for the elements and style of mineralisation.

The quality assurance data associated with the drilling consisted of 21 blanks, 42 analyses of a standard reference sample and 41 field duplicates. Analysis showed it to be of a suitable standard.

### Grade Estimation

Golder used cluster analysis, a multi-element classification method, to categorise the drill sample data. Cluster analysis classes were assessed to determine the relevant position in the regolith profile and validated by manual geological interpretation of the important upper vs lower saprolite horizon contact. Based on the cluster analysis classification the regolith horizons were modelled in 3D to inform geostatistical analysis and grade estimation.

Variography was not attempted on the Mt Thirsty North data. Golder expected that the low number of composites and the wide spaced drilling would not produce usable variogram models. Variogram models from the nearby Mt Thirsty deposit which is similar in nature to Mt Thirsty North provide a reasonable analogue for use in this early stage evaluation.

Only the 31 holes from the 2017 drilling were used in the estimation to avoid any sample support issues from the 2015 drilling that was sampled at different down hole lengths.

Grade estimates by ordinary kriging were constrained in each of the domains and the high-grade samples were constrained to only influence local blocks. The resulting block model honours local grades in drill holes and weathering geology (Figure 2).

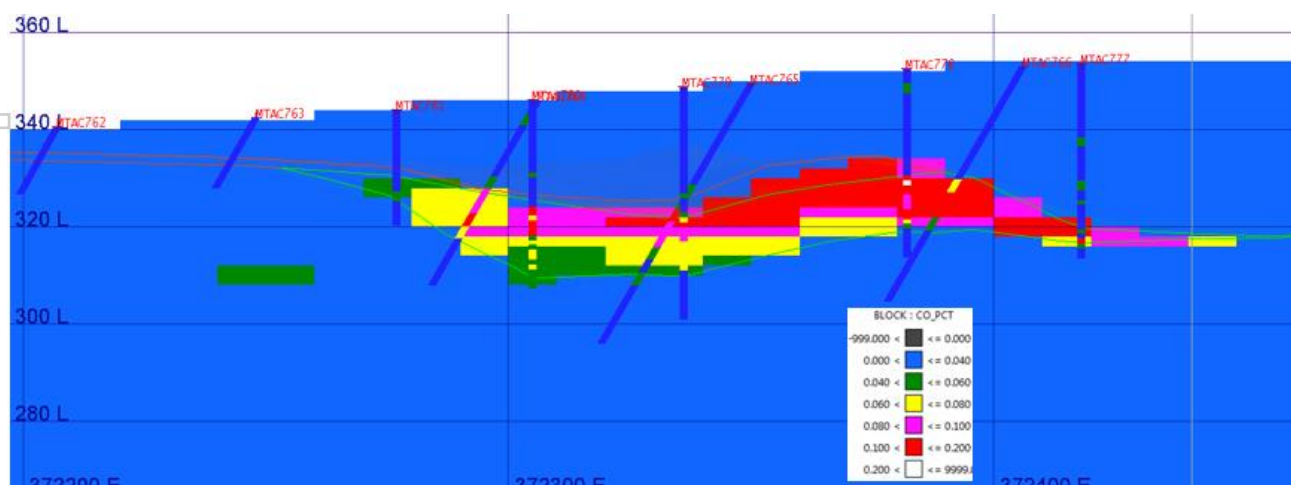


Figure 2: Cross-section 6450850N showing block and drill cobalt grades

### Cut-Off Grades

The Mineral Resource is reported above 0.06% cobalt. This cut-off is consistent with previous



Mineral Resource estimates at the main Mt Thirsty Deposit<sup>1</sup> and the 2017 Scoping Study<sup>2</sup>. The cut-off grade has been confirmed by recent preliminary financial modelling. It is assumed that all cobalt and nickel mineralisation above this cobalt grade will have reasonable prospects for eventual economic extraction.

### Mining and Metallurgical Methods and Other Modifying Factors

The geometry of the deposit (shallow, flat lying nature and low strip ratio) is amenable to open pit mining and the MTJV has completed a Scoping Study<sup>2</sup> at the main Mt Thirsty Deposit that demonstrated the potential of a mining operation at the site. Pit designs, based on optimised pit shells, completed during the Scoping Study<sup>2</sup>, were used to test for reasonable prospects for eventual economic extraction and it was noted that less than 2% of the mineralisation fell outside the pit limits.

No allowance has been made for any mining buffer zone around tenement boundaries. The deposit extends beyond the lease boundary and it is assumed that an agreement might be reached between the owners of the two sections of the deposit such that this section of the resource is extractable at some point in the future.

Scoping Study<sup>2</sup> and PFS level metallurgical test work programmes have been completed on samples from the main Mt Thirsty Deposit. These studies have demonstrated the potential for economic cobalt and nickel extraction using atmospheric leaching and a two-stage precipitation process to produce a nickel-cobalt mixed sulphide product.

### Mineral Resource Statement

Domain	Dry	Moisture	Co	Ni	Mn	Fe	Mg
	Tonnes						
	(Mt)	%	(%)	(%)	(%)	(%)	(%)
RSgo	0.03	30	0.071	0.38	0.40	28.9	1.97
RSmn	0.29	30	0.112	0.52	0.67	24.1	4.13
RSno	1.16	26	0.087	0.57	0.44	17.9	3.85
Inferred	1.48	27	0.092	0.55	0.48	19.4	3.86

Table 2 – 2019 Inferred Mineral Resource statement at a 0.06% cobalt cut-off  
(all grades reported on a dry basis)

### Next Steps

Engineering of the processing plant, and capital and operating cost estimating to a PFS level of accuracy at optimised conditions is now ready to commence subject to funding approval by the MTJV.

**SEAN GREGORY**

Managing Director & CEO

<sup>1</sup> Refer to ASX announcement 4/3/2019 for full details of the main Mt Thirsty Deposit Mineral Resource

<sup>2</sup> Refer to ASX announcement 5/10/2017 for full details of the Scoping Study

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## DISCLAIMER

The interpretations and conclusions reached in this report are based on current geological and metallurgical theory and the best evidence available to the authors at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however high these probabilities might be, they make no claim for complete certainty. Any economic decisions that might be taken based on interpretations or conclusions contained in this report will therefore carry an element of risk.

This report contains forward-looking statements that involve a number of risks and uncertainties. These forward-looking statements are expressed in good faith and believed to have a reasonable basis. These statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more of the risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this report. No obligation is assumed to update forward-looking statements if these beliefs, opinions and estimates should change or to reflect other future developments.

## COMPETENT PERSONS STATEMENTS

The information in this report that relates to drilling, sampling and assay data is based on and fairly represents information compiled by Michael J Glasson, a Competent Person who is a member of the Australian Institute of Geoscientists. Mr Glasson is an employee of Tasman Resources Ltd and in this capacity acts as part time consultant to Conico Ltd and the MTJV. Mr Glasson holds shares in Conico Ltd. Mr Glasson has sufficient relevant experience to the style of mineralisation and type of deposits under consideration and to the activity for which he is undertaking to qualify as a Competent Person as defined in the JORC Code (2012 Edition). Mr Glasson consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report which relates to Mineral Resources is based on information provided to and compiled by Mr David Reid, a Competent Person who is a full-time employee of Golder Associates Pty Ltd, and a Member of the Australasian Institute of Mining and Metallurgy. Mr Reid has sufficient relevant experience to the style of mineralisation and type of deposits under consideration and to the activity for which he is undertaking to qualify as a Competent Person as defined in the JORC Code (2012 Edition). Mr Reid consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

For the main Mt Thirsty Deposit, the company is not aware of any new information or data that materially affects the information presented and that the material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed. The company confirms that the form and context in which the Competent Persons' findings are presented have not been materially modified from the original market announcements.

## JORC TABLE 1

JORC Code Assessment Criteria	Comment
<b>Section 1 Sampling Techniques and Data</b>	
<b>Sampling Techniques</b>	<ul style="list-style-type: none"> <li>The majority of samples have been obtained by drilling of 30 vertical air core (AC) holes and one inclined hole on a close spaced grid to maximum depths of about 50 m within Exploration Licence E63/1267. All holes were used in the Mineral Resource Estimate.</li> <li>Resource drilling was carried out in 2017 with all holes drilled by the Mt Thirsty Joint Venture (Barra Resources Ltd and Conico Ltd).</li> <li>Holes were drilled on a regular spaced grid to below the base of the resource in most cases. Grid spacing is 40 m x 100 m over the majority of the deposit. There is an area of 40 m by 50 m near the middle of the deposit. Most holes were sampled at even regular 1 m intervals.</li> <li>AC drilling was mostly used to obtain 1 m samples from which a 2 kg split was bagged and sent to the laboratory. The sample was then dried and pulverised and a 40 gm sub sample analysed for Co, Ni, Mn, Al, Mg &amp; Fe using a four acid digest with an ICP OES finish.</li> </ul>
<p><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 downhole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.</i></p> <p><i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i></p>	





JORC Code Assessment Criteria	Comment
<p>Aspects of the determination of mineralisation that are Material to the Public Report. 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.</p>	
<p><b>Drilling Techniques</b></p> <p>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.).</p>	<ul style="list-style-type: none"> <li>AC blade drilling (85 mm hole diameter) was mostly used, with minor AC hammer in rare hard bands.</li> </ul>
<p><b>Drill Sample Recovery</b></p> <p>Method of recording and assessing core and chip sample recoveries and results assessed.</p> <p>Measures taken to maximise sample recovery and ensure representative nature of the samples.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>Sample recovery was generally excellent in dry powdery clay that hosts the upper portion of the mineralisation. Any intervals with obvious poorer sample recovery were recorded in the logs. These were mostly in greenish puggy clay sections beneath the oxidised zone in the lower portion of the deposit.</li> <li>Drill hole cuttings were collected in a cyclone, and subsequently reduced in volume with a) riffle splitter.</li> <li>The cyclone was cleaned between each 3 m rod and riffle splitters were cleaned as required. There was no water injection.</li> <li>There is no obvious relationship between grade and sample recovery. Most of the material drilled is strongly weathered, soft and fine grained. No significant sample bias is expected to have occurred due to preferential loss of fine/coarse material.</li> </ul>
<p><b>Logging</b></p> <p>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.</p> <p>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.), photography.</p> <p>The total length and percentage of the relevant intersections logged.</p>	<ul style="list-style-type: none"> <li>Logging is conducted in detail at the drill site by the site geologist, who routinely records weathering, lithology, alteration, mineralisation, or any other relevant features. It is considered to be logged at a level of detail to support appropriate Mineral Resource estimation and mining studies.</li> <li>Logging is qualitative in nature.</li> <li>The entire length of each hole was logged in 1 to 5 m intervals.</li> </ul>
<p><b>Sub-Sampling Techniques and Sample Preparation</b></p> <p>If core, whether cut or sawn and whether quarter, half or all core taken.</p> <p>If non-core, whether riffled, tube sampled, rotary split, etc., and whether sampled wet or dry.</p> <p>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</p> <p>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</p>	<ul style="list-style-type: none"> <li>All drill chips were collected in a cyclone and split by hand with a riffle splitter and the remaining sample was placed on the ground. There were no wet samples. Duplicate samples were obtained from the sample piles with a plastic scoop.</li> <li>Sample preparation followed industry standard practice of drying, coarse crushing to -6 mm, before pulverising to 90% passing 75 µm.</li> <li>To meet QAQC requirements duplicates were placed at irregular intervals in the sample stream, one or two duplicates per drill hole. Certified blanks (OREAS 24P or 22e) were also placed in the sample stream at the rate of 1 in 50. Additionally, a certified standard was also used in the sample stream (OREAS 182) at the rate of 4 standards per 100 samples.</li> </ul>

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JORC Code Assessment Criteria	Comment
<p><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></p> <p><i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></p>	<ul style="list-style-type: none"> <li>Duplicates were collected from approx. 1 in every 20 samples.</li> <li>The Co values in the blank samples ranged from &lt;1 to 2 ppm in OREAS 22e and 42 to 49 ppm in OREAS24P, close to the provided values of 0.68 and 44 ppm Co respectively; comparatively low compared to the estimated resource values and within acceptable ranges for blank samples. Overall there were only a small number of outliers in the 41 duplicates collected and therefore the duplicate results are also considered satisfactory.</li> <li>On average Co values obtained from the OREAS 182 standards were 3.8% less than the provided value of 728 ppm and within an acceptable range (681 to 726 ppm). Ni values were on average 1.8% below the provided value of 7070 ppm.</li> <li>Material being sampled is generally fine grained, and a 2-3 kg sample from each metre is considered adequate.</li> </ul>
<p><b>Quality of Assay Data and Laboratory Tests</b></p> <p><i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></p> <p><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></p> <p><i>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</i></p>	<ul style="list-style-type: none"> <li>Samples were crushed and pulverised, and analysed for Co, Ni, Mn, Mg, Al &amp; Fe using a four acid digest with an ICP OES finish by Bureau Veritas' Perth laboratory. These procedures are considered appropriate for the elements and style of mineralisation. Analysis is considered total.</li> <li>No geophysical tools have been used.</li> <li>The internal laboratory QAQC procedures included analysing its own suite of internal standards and blanks within every sample batch and also adding sample duplicates.</li> </ul>
<p><b>Verification of Sampling and Assaying</b></p> <p><i>The verification of significant intersections by either independent or alternative company personnel.</i></p> <p><i>The use of twinned holes.</i></p> <p><i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></p> <p><i>Discuss any adjustment to assay data.</i></p>	<ul style="list-style-type: none"> <li>Significant intersections are determined by company personnel and checked internally.</li> <li>Individual sample numbers are generated and matched on site with down hole depths. Sample numbers are then used to match assays when received from the laboratory. Verification of data is managed and checked by company personnel with extensive experience. All data is stored electronically, with industry standard systems and backups.</li> <li>Data is not subject to any adjustments.</li> </ul>
<p><b>Location of Data Points</b></p> <p><i>Accuracy and quality of surveys used to locate drill holes (collar and downhole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i></p> <p><i>Specification of the grid system used.</i></p> <p><i>Quality and adequacy of topographic control.</i></p>	<ul style="list-style-type: none"> <li>Collar locations were determined by hand held GPS and are accurate to approximately <math>\pm 5</math> m (northing and easting).</li> <li>The grid system used is AGD84; AMG Zone 51 to match a previously established grid.</li> <li>A DTM and 2.5 m spaced topographic contours have been prepared from ortho-photomaps and hole RLs are measured from these. This topographic control is considered quite adequate for the current purposes.</li> </ul>
<p><b>Data Spacing and Distribution</b></p> <p><i>Data spacing for reporting of Exploration Results.</i></p> <p><i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity</i></p>	<ul style="list-style-type: none"> <li>Drill holes are generally spaced on a regular grid of 40 m x 100 m.</li> <li>The drill hole spacing is considered more than sufficient to establish the degree of geological and</li> </ul>



JORC Code Assessment Criteria	Comment
<p><i>appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</i></p> <p><i>Whether sample compositing has been applied.</i></p>	<p>grade continuity for Mineral Resources estimation of this style of mineralisation.</p> <ul style="list-style-type: none"> <li>Most holes were sampled and assayed in 1 m intervals and no other compositing has been applied during sample collection and laboratory preparation.</li> </ul>
<p><b>Orientation of Data in Relation to Geological Structure</b></p> <p><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></p> <p><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></p>	<ul style="list-style-type: none"> <li>The mineralisation is mostly contained within a flat lying weathering blanket and vertical holes achieve unbiased sampling in most cases.</li> <li>A few isolated very thick intersections are believed to be related to weathering down vertical structures and these were interpreted with limited areal extent to minimise bias.</li> </ul>
<p><b>Sample Security</b></p> <p><i>The measures taken to ensure sample security.</i></p>	<ul style="list-style-type: none"> <li>Samples were either taken directly from the drill site to the laboratory in Kalgoorlie or delivered to a dedicated cartage contractor in Norseman by company employees and/or contractors.</li> </ul>
<p><b>Audits and Reviews</b></p> <p><i>The results of any audits or reviews of sampling techniques and data.</i></p>	<ul style="list-style-type: none"> <li>The drill hole database was validated by Golder prior to the resource estimation with no significant errors arising.</li> </ul>
<b>Section 2 Reporting of Exploration Results</b>	
<p><b>Mineral Tenement and Land Tenure Status</b></p> <p><i>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.</i></p> <p><i>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.</i></p>	<ul style="list-style-type: none"> <li>The exploration results relate to the Mt Thirsty North Cobalt-Nickel Deposit, discovered in 2015, and part of the Mt Thirsty Project, located approximately 16 km northwest of Norseman, Western Australia. The tenements are owned 50:50 (Mt Thirsty Joint Venture, MTJV) by Conico Ltd (through its subsidiary Meteore Metals Pty Ltd) and Barra Resources Ltd. The project includes Retention Licence R63/4, Exploration Licences E63/1267, and E63/1790 and Prospecting Licence P63/2045. Mining Lease applications have been lodged over R63/4 and E63/1267 and a General Purpose Lease application over E63/1790 and P63/2045. The Mineral Resource referred to in this announcement is located on E63/1267.</li> <li>The tenements lie within the Ngadju native title claim (WC99/002), and agreements between the claimants and the tenement holders are designed to protect Aboriginal heritage sites and facilitate access. There are no historical or wilderness sites or national parks or known environmental settings that affect the Mt Thirsty Project although the project area is located within the Great Western Woodlands.</li> <li>Meteore/Barra have secured tenure over the project area and there are no known impediments to obtaining a licence to operate in the area.</li> </ul>
<p><b>Exploration Done by Other Parties</b></p> <p><i>Acknowledgment and appraisal of exploration by other parties.</i></p>	<ul style="list-style-type: none"> <li>The Mt Thirsty area was explored for nickel sulphide mineralisation in the late sixties and early seventies by Anaconda, Union Miniere, CRA, WMC/CNGC and others. Although no significant sulphide discoveries were made during that time, limonitic nickel/cobalt mineralisation was encountered but not followed up. In the 1990s Rolute-Samantha discovered high grade cobalt mineralisation in the oxidised profile above an orthocumulate peridotite that now forms part of the main Mt Thirsty Cobalt-Nickel Deposit located 3 km south of Mt Thirsty North.</li> </ul>
<b>Geology</b>	





JORC Code Assessment Criteria	Comment
<p><i>Deposit type, geological setting and style of mineralisation.</i></p>	<ul style="list-style-type: none"> <li>The Mt Thirsty North Cobalt-Nickel Deposit mineralisation has developed as a result of weathering of ultramafic (peridotite) rocks located at the southern end of the Archaean Norseman – Wiluna greenstone belt. Most of the Co and some of the Ni mineralisation is associated with manganese oxides which have formed in the weathering profile.</li> </ul>
<p><b>Drill hole information</b></p> <p><i>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:</i></p> <ul style="list-style-type: none"> <li><i>Easting and northing of the drill hole collar</i></li> <li><i>Elevation or RL (Reduced Level-elevation above sea level in metres) of the drill hole collar</i></li> <li><i>Dip and azimuth of the hole</i></li> <li><i>Down hole length and interception depth</i></li> <li><i>Hole length</i></li> </ul>	<ul style="list-style-type: none"> <li>Not applicable.</li> </ul>
<p><b>Data aggregation methods</b></p> <p><i>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.</i></p> <p><i>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.</i></p> <p><i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i></p>	<ul style="list-style-type: none"> <li>Not applicable.</li> <li>No equivalent values are used.</li> </ul>
<p><b>Relationship between mineralisation widths and intercept lengths</b></p> <p><i>These relationships are particularly important in the reporting of Exploration Results.</i></p> <p><i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i></p> <p><i>If it is not known and only the down-hole lengths are reported, there should be a clear statement to this effect (e.g. 'downhole length, true width not known').</i></p>	<ul style="list-style-type: none"> <li>As the mineralisation is generally flat lying and nearly all holes were drilled vertically; down hole width is mostly considered to be true width.</li> </ul>
<p><b>Diagrams</b></p> <p><i>Where possible, maps and sections (with scales) and tabulations of intercepts should be included for any material discovery being reported if such diagrams significantly clarify the report.</i></p>	<ul style="list-style-type: none"> <li>All diagrams contained in this document are generated from spatial data displayed in industry standard mining and GIS packages.</li> </ul>
<p><b>Balanced reporting</b></p> <p><i>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.</i></p>	<ul style="list-style-type: none"> <li>Not applicable.</li> </ul>
<p><b>Other substantive exploration data</b></p> <p><i>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;</i></p>	<ul style="list-style-type: none"> <li>No metallurgical test work was carried out on Mt Thirsty North samples. However due to their strong similarity to those from the main Mt Thirsty Cobalt-Nickel Deposit, Co and Ni are considered likely to be recoverable under similar metallurgical conditions.</li> </ul>



JORC Code Assessment Criteria	Comment
<i>potential deleterious or contaminating substances.</i>	
<b>Further work</b>	<ul style="list-style-type: none"> <li>The limits of the resource are almost fully defined as the mineralisation thins markedly to the north and south. Further drilling to test for limited north and south extensions and infill drilling to upgrade the Mineral Resource classification will be contemplated in the future.</li> </ul>
<p><i>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</i></p> <p><i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i></p>	
<b>Section 3 Estimation and Reporting of Mineral Resources</b>	
<b>Database Integrity</b>	<ul style="list-style-type: none"> <li>An extract from the MTJV's master Acquire database was provided to Golder for this study.</li> <li>On loading the database for modelling, Golder performed data checks including the verification of: <ul style="list-style-type: none"> <li>Collar depth with final sample depth.</li> <li>Collar RLs with topographic data where possible.</li> <li>Any overlapping intervals or gaps in the downhole data.</li> <li>Grid survey problems.</li> <li>Duplicate drill hole numbers and coordinates.</li> <li>Duplicate geological and assay intervals.</li> <li>Nominal surveys vs. precise surveys.</li> </ul> </li> </ul>
<p><i>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.</i></p> <p><i>Data validation procedures used.</i></p>	
<b>Site Visits</b>	<ul style="list-style-type: none"> <li>Golder did not visit site for this resource update.</li> <li>Mr M Glasson has visited the site on numerous occasions in his role as consultant geologist including oversight of recent drilling programmes.</li> </ul>
<p><i>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</i></p> <p><i>If no site visits have been undertaken indicate why this is the case.</i></p>	
<b>Geological Interpretation</b>	<ul style="list-style-type: none"> <li>Sample data analysed using Kmeans clustering to group data into like domains. This is checked against dominant logging codes.</li> <li>Kmeans cluster results are loaded into Leapfrog geological modelling software. Interpretation of regolith domains based on cluster classes was wireframed into 3D shapes using Leapfrog's in-built modelling tools.</li> </ul>
<p><i>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</i></p> <p><i>Nature of the data used and of any assumptions made.</i></p> <p><i>The effect, if any, of alternative interpretations on Mineral Resource estimation. The use of geology in guiding and controlling Mineral Resource estimation.</i></p> <p><i>The factors affecting continuity both of grade and geology.</i></p>	
<b>Dimensions</b>	
<p><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></p>	<ul style="list-style-type: none"> <li>The deposit has a strike length of approximately 850 m and a maximum plan width of about 200 m. The Mineral Resources estimates have been constrained by tenement boundaries.</li> </ul>
<b>Estimation and Modelling Techniques</b>	<ul style="list-style-type: none"> <li>The block dimensions for the Mt Thirsty North Cobalt-Nickel Deposit were determined on the basis of drilling density, and mining assumptions.</li> <li>Grade estimation was completed using Ordinary Kriging (OK) in Golder proprietary software. Grades were estimated for Co, Ni, Mn, Fe and Mg using 1 m composites.</li> <li>The regolith horizons were estimated using hard boundaries for all variables.</li> <li>Grade estimates were made to the parent block volume of 20 x 50 x 2 m. Sub-cells of 10 x 25 x 2 m</li> </ul>
<p><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></p> <p><i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral</i></p>	



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<p><i>Resource estimate takes appropriate account of such data.</i></p> <p><i>The assumptions made regarding recovery of by-products.</i></p> <p><i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulfur for acid mine drainage characterisation).</i></p> <p><i>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</i></p> <p><i>Any assumptions behind modelling of selective mining units.</i></p> <p><i>Any assumptions about correlation between variables.</i></p> <p><i>Description of how the geological interpretation was used to control the resource estimates.</i></p> <p><i>Discussion of basis for using or not using grade cutting or capping.</i></p> <p><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></p>	<p>were used to provide reasonable resolution of geological boundaries.</p> <ul style="list-style-type: none"> <li>High grade spatial constraints were applied to Ni, Co, and Mn to limit extrapolation of high-grade samples.</li> </ul>
<p><b>Moisture</b></p> <p><i>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</i></p>	<ul style="list-style-type: none"> <li>The dry tonnages were estimated using dry bulk density.</li> <li>All grades are reported on a dry % basis.</li> <li>Moisture determinations were completed on 142 samples from the main Mt Thirsty Cobalt-Nickel Deposit and averages assigned to all blocks by regolith horizon.</li> </ul>
<p><b>Cut-off Parameters</b></p> <p><i>The basis of the adopted cut-off grade(s) or quality parameters applied.</i></p>	<ul style="list-style-type: none"> <li>Mineral Resources are reported at 0.06% Co cut-off grade.</li> </ul>
<p><b>Mining Factors or Assumptions</b></p> <p><i>Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution.</i></p> <p><i>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></p>	<ul style="list-style-type: none"> <li>This Mineral Resource statement assumes mining by conventional shallow open pit techniques.</li> </ul>
<p><b>Metallurgical Factors or Assumptions</b></p> <p><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</i></p>	<ul style="list-style-type: none"> <li>Scoping study level metallurgical test work programmes have been completed for the nearby Mt Thirsty Cobalt-Nickel Deposit. These studies have demonstrated the potential for economic Co and Ni extraction using atmospheric leaching to produce a Ni-Co mixed sulphide product. No metallurgical test work had been carried out at Mt Thirsty North; however, due to the close similarities in mineralisation styles the current metallurgical test</li> </ul>



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<i>with an explanation of the basis of the metallurgical assumptions made.</i>	work results are expected to broadly apply to Mt Thirsty North.
<b>Environmental Factors or Assumptions</b>	<ul style="list-style-type: none"> <li>Golder is not aware of any environmental issues that would affect the eventual economic extraction of the deposit.</li> <li>Spring environmental surveys were completed over the project area during 2018, including the area over Mt Thirsty North. No rare flora or fauna were observed.</li> </ul>
<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>	
<b>Bulk Density</b>	<ul style="list-style-type: none"> <li>Wet bulk density, moisture, and dry bulk density was assigned to each of the regolith horizons. These are based on values were derived from sonic drill holes completed in the nearby Mt Thirsty Cobalt-Nickel Deposit.</li> <li>Moisture and dry bulk density values are derived from 142 core samples tested by the MTJV in 2018. Examination of results shows some variation in both moisture and dry bulk density as is expected through a laterite deposit.</li> </ul>
<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>  <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>  <i>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</i>	
<b>Classification</b>	<ul style="list-style-type: none"> <li>Mineral Resources were classified in accordance with the Australasian Code for the Reporting of Identified Mineral Resources and Ore Reserves (JORC, 2012).</li> <li>The classification of the Mineral Resource was completed by Golder geologists. The classification of Mineral Resource was considered appropriate on the basis of data density and quality, representativeness of sampling, geological confidence criteria, and estimation performance parameters.</li> </ul>
<i>The basis for the classification of the Mineral Resources into varying confidence categories.</i>  <i>Whether 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.</i>  <i>Whether the result appropriately reflects the Competent Person(s)' view of the deposit.</i>	
<b>Audits or Reviews</b>	<ul style="list-style-type: none"> <li>No audits or reviews have been undertaken on this Mineral Resource estimate.</li> </ul>
<i>The results of any audits or reviews of Mineral Resource estimates.</i>	
<b>Discussion of Relative Accuracy/Confidence</b>	<ul style="list-style-type: none"> <li>The Mineral Resources are an estimate of the global in situ grades. No production data or tests are available to compare with this resource estimate.</li> <li>The relative accuracy is reflected in the Mineral Resource classification discussed above that is in line with industry acceptable standards.</li> </ul>
<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>  <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>	



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<i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i>	

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