



# POSITIVE MT THIRSTY PFS TO PROVIDE 'FIRST WORLD' SECURITY OF COBALT SUPPLY

## HIGHLIGHTS

- Mt Thirsty now assumes the mantle of Australia's most advanced genuine cobalt project with a completed Pre-Feasibility Study (PFS)
- Nickel is a useful by-product with a cobalt-nickel value split of 71%-29%
- Hydrometallurgical process is at atmospheric pressure and 70-90°C utilising sulphur dioxide (SO<sub>2</sub>) as the main reagent
- Project scaled up to 1.8 Mtpa feed rate
- 19.1kt of cobalt and 24.8kt of nickel as a Mixed Sulphide Product (MSP) will be produced over a 12 year mine life
- Maiden JORC 2012 Probable Ore Reserve of 18.8 Mdt at 0.13% cobalt and 0.54% nickel estimated for the project
- Additional 1.8Mdt (<10%) of Inferred Mineral Resources scheduled. *There is a low level of confidence associated with inferred mineral resources and there is no certainty that further exploration will result in the determination of indicated mineral resources or that the production target itself will be realised.*
- Positive economics returned with a pre-tax NPV of A\$44.4M (A\$25.7M post-tax)
- Capital Expenditure of A\$371M including 10% indirects, 9% growth, 4% owner's costs, and 10% contingency
- All in Sustaining Costs of US\$35,400/t contained cobalt
- Cobalt price forecast to rise by all surveyed investment banks as demand for electric vehicle batteries continues to grow and other cobalt supply growth options limited
- The Mt Thirsty Joint Venture (MTJV) has identified the highest value development path to be a farm-in from a large global firm, eager to secure a guaranteed sustainable source of cobalt
- The direct project expenditure for the MTJV now reverts to a minimum while the partnering strategy is pursued as planned
- The MTJV is now re-engaging with several major Australian and international mining, trading and refining firms who have all identified a high quality PFS as their minimum investment criteria

Barra's Managing Director and CEO and MTJV PFS Manager Sean Gregory commented: "This study is the culmination of 18 months' work by the MTJV. I am confident that the PFS has been completed to a very high standard by global engineering houses that will stand up to the most detailed scrutiny from potential project partners. We are now looking forward to engaging with these large global firms who are eager to secure a guaranteed sustainable source of cobalt for electric vehicle batteries."

## ASX ANNOUNCEMENT

20<sup>th</sup> February 2020

### BARRA RESOURCES LIMITED

A.B.N. 76 093 396 859

#### Corporate Details:

ASX Code: BAR

Market Cap: \$11.3M  
@ 1.9c

Cash: \$1,180,000  
(Dec 31)

#### Issued Capital:

596.5M Ordinary Shares  
38M Options

#### Substantial Shareholders:

FMR Investments 14.0%  
Mineral Resources Ltd 9.6%

## 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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# Mt Thirsty Cobalt Nickel Project Pre-Feasibility Study

## *Executive Summary*

**February 2020**

Mt Thirsty Joint Venture

**Revision:** 2  
**Date:** 20/02/2020



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## 1. INTRODUCTION

The Mt Thirsty Co-Ni Project (Project) is located about 16 km NW of Norseman in the Eastern Goldfields of Western Australia (Figure 1). The Project is being developed by the Mt Thirsty Joint Venture (MTJV) which is an unincorporated 50/50 joint venture between ASX listed companies Barra Resources Limited and Conico Limited. There are two deposits on the tenements, Mt Thirsty Main and Mt Thirsty North.

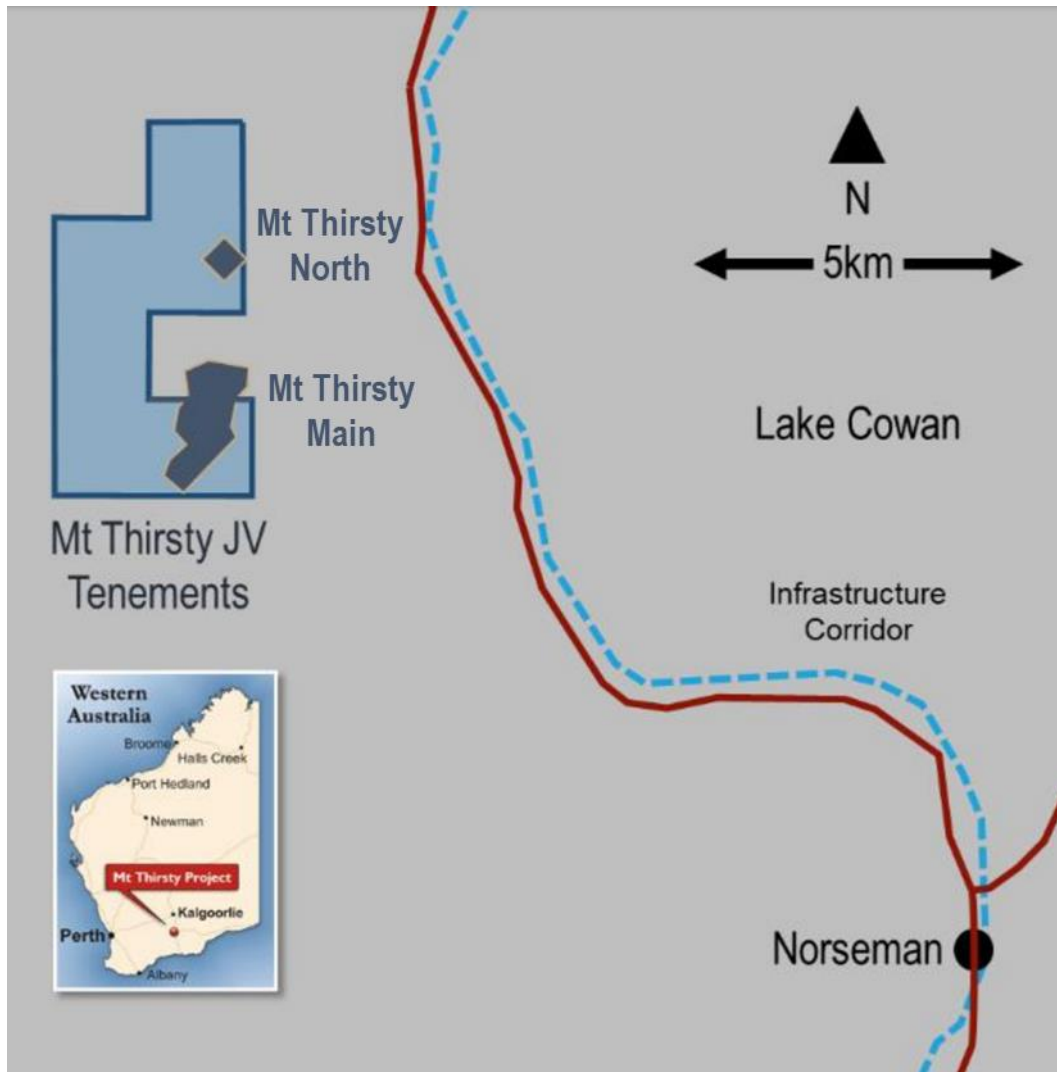


Figure 1 – Project Location

## 2. TENURE

The Project comprises four adjacent granted exploration tenements covering an area of approximately 1,768 hectares (~17.7km<sup>2</sup>). All tenements are located on Unallocated Crown Land and wholly within the Ngadju Native Title Claim which was determined and registered in 2014. Tenement details are displayed in Table 1 below and their locations are shown in Figure 2.

Table 1 - Mt Thirsty Project tenement details

Tenement	Granted	Expiry	Area (ha)	Annual Commitment	Purpose
<b>R63/04</b>	1/07/2016	30/06/2019	571	\$0	To be replaced by M(A)63/670
<b>E63/1267</b>	28/04/2010	27/04/2020	582	\$50,000	To be replaced by M(A)63/699
<b>E63/1790</b>	23/02/2017	22/02/2022	582	\$15,000	To be covered by G(A)63/9
<b>P63/2045</b>	16/02/2017	15/02/2021	33	\$2,000	To be covered by G(A)63/9
<b>L63/80</b>	14/08/2019	13/08/2040	595		Western palaeochannel water search
<b>L63/81</b>	14/08/2019	13/08/2040	178		Lake Cowan water search
<b>L(A)63/91</b>			181		Northern access route
<b>L(A)63/92</b>			331		Southern access route
<b>Total</b>			<b>3,053</b>	<b>\$67,000</b>	<i>*(A) = Application</i>

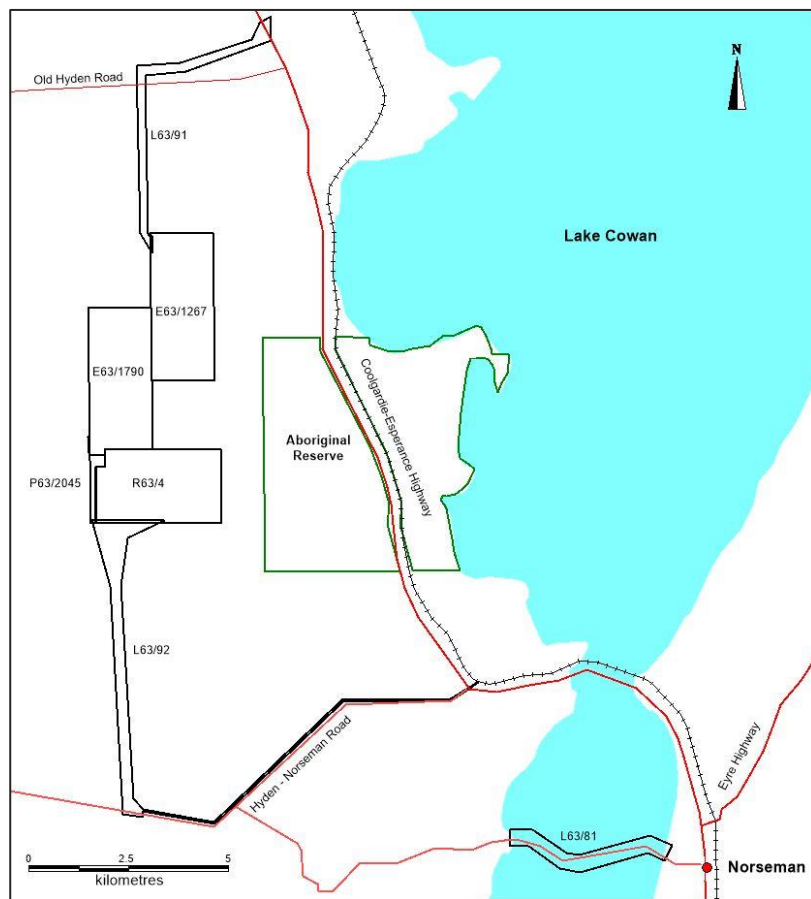


Figure 2 - Mt Thirsty Cobalt-Nickel Project, tenement location map

### 3. GEOLOGY

#### 3.1 Regional Geology

The Project is underlain by the Archaean Mt Kirk Formation which outcrops at the southern end of the Norseman-Wiluna greenstone belt (Figure 3). The Mt Kirk Formation comprises a metamorphosed sequence of sediments, peridotite, pyroxenite, gabbro and mafic-felsic volcanic rocks which are intruded by granite and pegmatite dykes on its western side and in faulted contact with the Woolyeenyer Formation on its eastern side. Drilling by the MTJV indicates the pegmatite dykes in the local area are relatively flat lying.

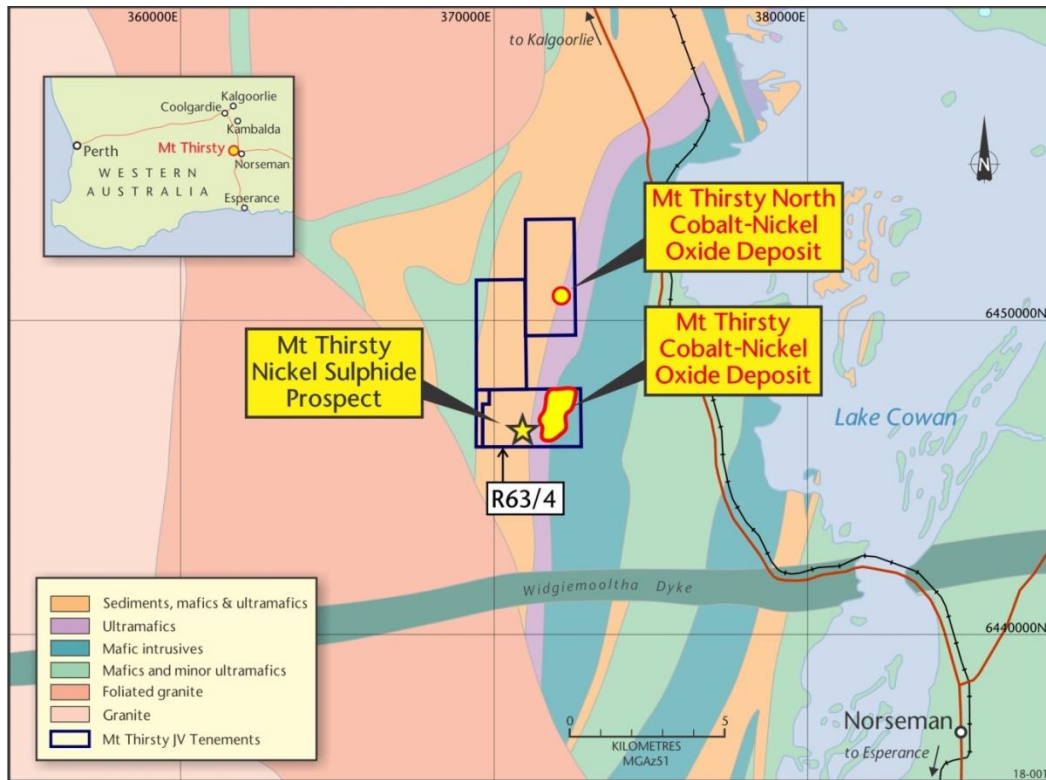


Figure 3 - Location of Mt Thirsty tenements showing regional geology

#### 3.2 Exploration History

The Mt Thirsty area was explored for nickel sulphide mineralisation in the late nineteen sixties and early seventies by Anaconda, Union Miniere and CRA. Although no significant nickel sulphide discoveries were made during that time, limonitic cobalt/nickel mineralisation was encountered but not followed up. In the 1990's Rolute-Samantha discovered high grade cobalt-nickel mineralisation in the oxidised profile derived from intense weathering of the peridotite rocks.

The Mt Thirsty Cobalt-Nickel Deposit has been progressively delineated by a series of drilling campaigns from 1996-2018 including 696 Air Core (AC) holes, 14 Reverse Circulation (RC) holes, 21 Rotary Air Blast (RAB) holes, and 7 Sonic Core (SC) holes for a total of 31,827 m. Drill hole spacing at 50m x 40m on the eastern side and 50m x 80m on the western side of the Main deposit is sufficiently close for the style of mineralisation and to allow for a Mineral Resource Estimation (MRE).

In 2015 a small deposit of similar style to the Mt Thirsty Main Deposit was discovered approximately 3km to the north (Mt Thirsty North). This deposit was defined by 47 air core holes for 1,705 m on a 40m x 100m grid spacing.

AC and RC drill hole cuttings were collected using a cyclone and subsequently reduced in volume with a sampling tube (for some pre-2009 drilling), riffle or rotary splitter. The cyclone was cleaned between each three-metre rod and every metre for wet samples and riffle splitters were cleaned as required. Water injection

was kept to a minimum. Over 90% of the holes were sampled at regular 1m intervals. Half-core samples collected from SC drilling was also at regular 1m intervals.

All samples were crushed, pulverised, and analysed for Co, Ni, Mn, Zn, Mg, Al & Fe using a four-acid digestion technique and analysed using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) at Bureau Veritas' Kalassay laboratory in Kalgoorlie, Western Australia. These procedures are appropriate for the elements and style of mineralisation and the analysis is considered total.

A comparison of the analytical results from twin, AC, RC and SC holes 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. The bulk of the drilling is AC which, based on population statistics, is slightly conservative compared to RC and SC drilling results.

The quality assurance data associated with the drilling also proved to be suitable for an MRE.

### 3.3 Deposit Geology

The Mt Thirsty Cobalt-Nickel Deposit has formed within intensely weathered ultramafic peridotite orthocumulate rocks overlain by a Tertiary laterite capping. The host peridotite is sandwiched between a sediment-ultramafic-basalt sequence to the west and a pyroxenite unit to the east. The pyroxenite unit is interpreted to form the base of the Mt Thirsty Sill.

Deep chemical weathering and supergene enrichment processes associated with high rainfall in the Tertiary period have produced a relatively flat lying supergene blanket style deposit within the weathered profile beneath a ferruginous laterite cap. The laterite cap is up to 15m thick but has been partly or completely eroded on the eastern side of the deposit forming several half mesas with steep slopes on their eastern sides and gentle slopes to the west. Oxidation of the peridotite extends down to almost 100m below surface in some places where weathering processes have been focused down fractures.

The deposit is enriched in cobalt, nickel and manganese. The manganese and cobalt contents are particularly high compared to most nickel laterite deposits located in Western Australia. Most of the cobalt and some of the nickel is contained in the secondary manganese oxide mineral asbolane. Most of the nickel however is contained in goethite and some also occurs in silicate minerals in the lower saprolite horizon.

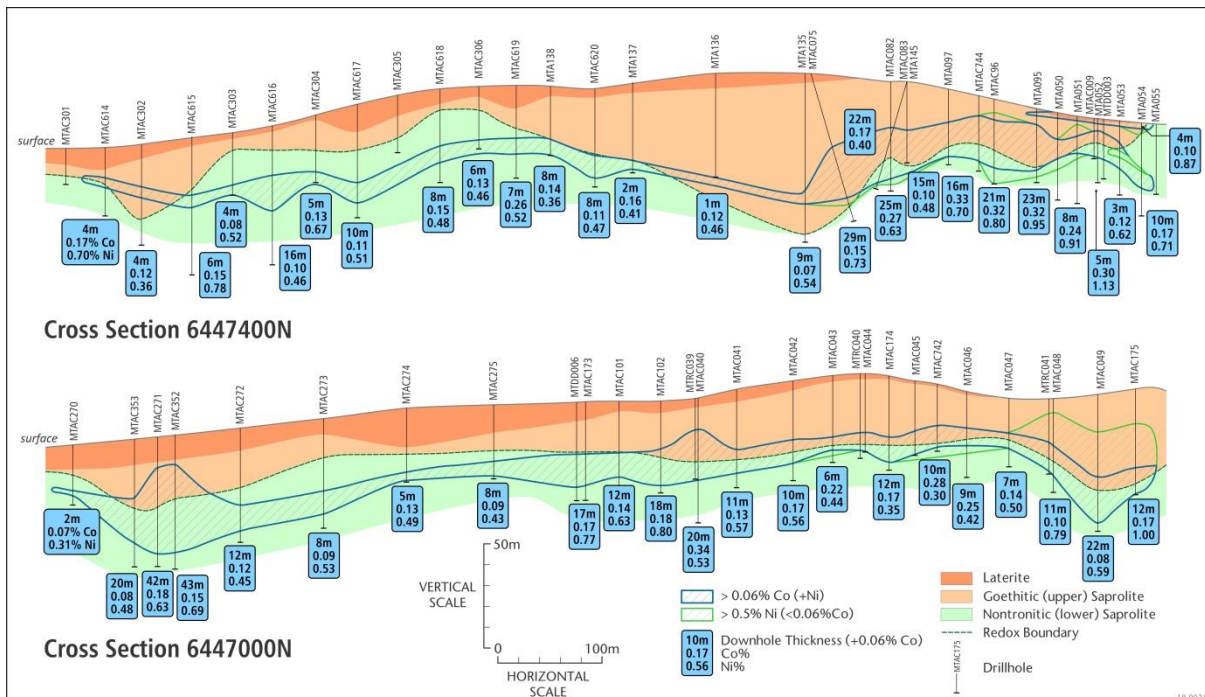


Figure 4 - Cross Sections through the Mt Thirsty Cobalt-Nickel Deposit showing weathering profile and outlines of cobalt and nickel mineralisation



### 3.4 PFS Metallurgical Sample Drilling

Two drilling programs (Figure 5) were carried out to source metallurgical samples for use in the PFS. A six-hole RC program (MTRC036 to 041) was completed in November 2016 and a further three AC holes (MTAC 798, 799 & 801) were drilled in August 2018.

Test work during the Scoping Study was completed on a Master Composite made up from the 2016 RC drill samples (Figure 5, Table 2). The Master Composite comprised a blend of approximately half upper saprolite domain (upper) and half lower saprolite domain (lower) at cobalt and nickel grades representative of the most important early years of the mine plan.

Over the entire Mineral Resource, the upper domain accounts for 13% and the lower domain accounts for 87% of the available tonnes. As part of this PFS, composites for the upper and lower domains at grades representative of the early years in the mine plan were also blended from the same RC samples from 2016.

Additionally, the three AC drill holes drilled in August 2018 to collect fresh samples for beneficiation test work (Table 2) were also blended into upper and lower composites, although at cobalt and nickel grades representative of the overall Mineral Resource averages for those domains.

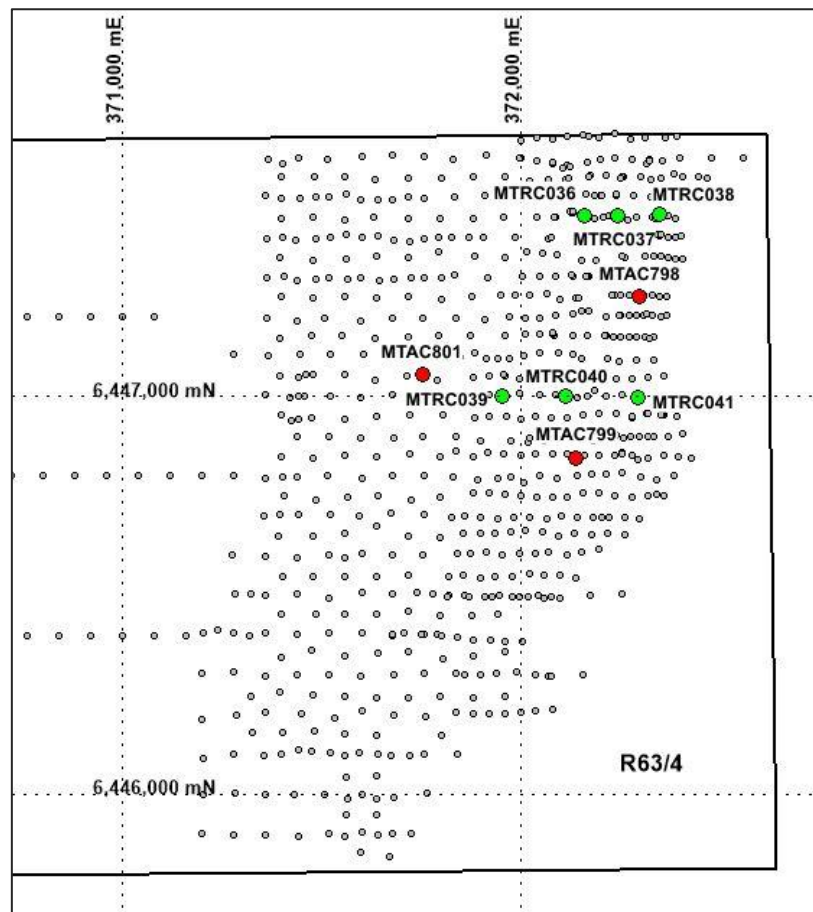


Figure 5 - Location of holes drilled for 2016 (RC, green) and 2018 (AC, red) metallurgical samples (grid AGD84, Z51)

Table 2 - Drill holes used in the sample composites. All holes are vertical. Grid AGD84 Zone 51.

Hole ID	Date Drilled	Easting	Northing	RL (m)	Depth (m)	Composite Intervals (m)
<b>MTRC036</b>	20/11/2016	372162	6447455	378	54	18-42
<b>MTRC037</b>	19/11/2016	372244	6447455	376	30	13-30
<b>MTRC038</b>	19/11/2016	372349	6447457	369	35	14-28
<b>MTRC039</b>	20/11/2016	371956	6447000	382	40	14-34
<b>MTRC040</b>	20/11/2016	372115	6447001	393	40	30-36
<b>MTRC041</b>	20/11/2016	372295	6446999	381	35	23-32
<b>MTAC798</b>	14/08/18	372300	6447251	377	30	3-5 8-10 16-26
<b>MTAC799</b>	14/08/18	372121	6446846	392	60	35-48 54-56
<b>MTAC801</b>	14/08/18	371754	6447056	375	35	23-34



Figure 6 - Sample collection at Mt Thirsty, August 2018

## 4. MINERAL RESOURCES

### 4.1 Density and Moisture Determination

Representative core sticks were collected from 2008 Sonic Core (SC) drilling. SC is a relatively expensive method that is considered to be best practice for representative sampling without core losses for deposits like Mt Thirsty. In 2008, the core sticks were measured for wet density as presented (i.e. including in-situ moisture).

In 2018, the MTJV recovered 156 of these core sticks from storage and had them remeasured for dry density. After excluding outliers, 142 samples were analysed in detail. The difference between wet density and dry density is the in-situ moisture. Average densities and moisture contents were applied to each domain in the Mineral Resource independently.

### 4.2 Domaining

MTJV geologists manually interpreted a surface to define the upper- and lower- saprolite domains in 2018, however further sub-domaining was not possible from visual inspection of the cross sections. Golder Associates Pty Ltd (Golder) have been able to automatically group data into like domains using a multi-element statistical technique called K-means Clustering followed by wireframing into 3D shapes using Leapfrog software to produce a geological domain model. The two dominant domains which account for 99% of the resource (manganese enriched Goethitic Saprolite and Nontronite Saprolite) agree very closely with the upper- and lower-saprolite domains that were manually interpreted and formed the basis for selecting samples for metallurgical testing.

### 4.3 Grade Estimation

Grade estimates by ordinary kriging were constrained in each of these domains and the high-grade samples were constrained to only influence local blocks.

The 2019 resource model contains some smoothing (averaging) across ore-waste boundaries. By comparing to the 2011 model it can be quantified as approximately 10% dilution. Golder have advised that this is reasonable for the style of deposit and proposed mining methods. When using the 2019 model for mining studies, Golder have recommended not applying any further dilution other than that which might be caused when aggregating blocks to various mining bench heights.

### 4.4 Classification Criteria

The classification of the Mineral Resource is more sophisticated than drill hole spacing alone, which in this case is considered adequate for both Indicated and Inferred Mineral Resources. In the case of the Mt Thirsty Mineral Resource, it is the improved confidence in the quality of the data on two fronts that has allowed the classification to be improved,

Firstly, the statistical comparison of different drilling methods confirmed their suitability for use in an Indicated Mineral Resource. As such, no additional drilling was specifically completed to facilitate the upgrade from the previous JORC 2004 Inferred and Indicated Mineral Resource to the current JORC 2012 Mineral Resource which is now mostly (90%) classified as Indicated.

Secondly, the knowledge of direct physical measurements of wet densities, dry densities and in-situ moisture contents for a large number of samples across all geological domains is a key determinant in achieving higher levels of confidence and therefore the higher resource categories in the application of the JORC code. The Indicated portion of the Mineral Resource is in the core of the Mt Thirsty Main deposit. Around the margins of the deposit, a buffer has been assumed such that 10% of the Mineral Resource is Inferred, consistent with the lower confidence in these areas. An area in the south east of the deposit where RAB drilling is prominent has also been classified as Inferred due to the lower confidence associated with this drilling and sampling method.

## 4.5 Mineral Resource estimates

Table 3 - 2019 Mineral Resource estimates (all grades reported on a dry basis)

Mineral Resource	Cut-off (Co%)	Wet Tonnes (Mt)	Moisture (% wet t)	Dry Tonnes (Mt)	Co (%)	Ni (%)	Mn (%)	Fe (%)
<b>Mt Thirsty Main Indicated</b>	0.06	31.2	27%	22.8	0.121	0.53	0.79	21.3
<b>Mt Thirsty Main Inferred</b>	0.06	3.5	27%	2.5	0.103	0.45	0.66	19.1
<b>Mt Thirsty Main Sub Total</b>	0.06	34.7	27%	25.4	0.119	0.52	0.77	21.1
<b>Mt Thirsty North Inferred</b>	0.06	2.0	27%	1.5	0.092	0.55	0.48	19.4
<b>Total</b>	0.06	36.7	27%	26.9	0.117	0.52	0.76	20.9

Refer to ASX Announcement 9/9/2019 for full details of the Mineral Resource.

The Mineral Resource is reported above 0.06% cobalt (Table 3). This cut-off is consistent with previous Mineral Resource estimates and the 2017 Scoping Study. The cut-off grade has been confirmed by the Ore Reserve declared as part of this PFS. It is assumed that all cobalt and nickel mineralisation above this cobalt grade will have reasonable prospects for eventual economic extraction.

## 5. HYDROGEOLOGY

The MTJV engaged Golder to undertake a hydrogeological desktop study to determine likely groundwater sources capable of supplying the required process water to the Project. The study highlighted three target areas for drill testing.

Most groundwater in the area is expected to be saline to hypersaline except for small supplies in a few locations yet to be demonstrated. Golder estimate the water could be anywhere between 2 times and 10 times seawater. Scoping Study test work identified that the saline water is helpful in settling the ore. All PFS metallurgical test work has been conducted with synthetic water made up to 4 times seawater with sodium chloride salt.

The two main groundwater supply targets outlined by the study are the trunk palaeochannel aquifers inferred to exist beneath Lake Cowan 15km to the south-east and in a salt lake area 30-40 km to the north-west of the Project.

The third groundwater supply target are weathered and fractured bedrock deposits located within the Project area along an identified photo-lineament and includes at least one of the high ground water flow drill sites previously identified during MTJV mineral exploration drilling. This target may yield smaller quantities of higher quality water.

The PFS has assumed a water supply of 1.8 GLpa of hyper saline (4 times seawater) from the paleochannel aquifers for process water supplemented by 0.2 GLpa of saline water (1 times seawater) to be treated by reverse osmosis for the potable and demineralised water requirements for the Project.

A \$170,000 investigative drilling program has been prepared with program of work approvals in place. This will form a key part of future studies on the Project.

## 6. METALLURGY

### 6.1 Mineralogy

QEMSCAN, XRD analysis, Electron Microprobe, SEM Analysis, and photomicrographs have all been completed on the Mt Thirsty Ore.

One specific observation from the QEMSCAN analysis that is relevant to the leaching optimisation is that 62% of the cobalt is present in the manganese mineral (asbolane) which is readily leached with  $SO_2$  (Figure 7 - QEMSCAN elemental department for Cobalt and Nickel). The remainder of the cobalt and most of the nickel is in the harder to leach iron oxide mineral (goethite). Lower nickel extractions are explained by 44% of the nickel being in the silicate mineral (chlorite) which is not leached by the methods studied. Two separate reactions are used to target the asbolane and the goethite. The Scoping Study results align with successfully leaching the asbolane and only a small proportion of the goethite. This knowledge of two separate reactions enabled the PFS to:

- Leach the asbolane as rapidly and efficiently as possible; and
- Target the secondary nickel and cobalt mineralisation in goethite with minimal iron dissolution.

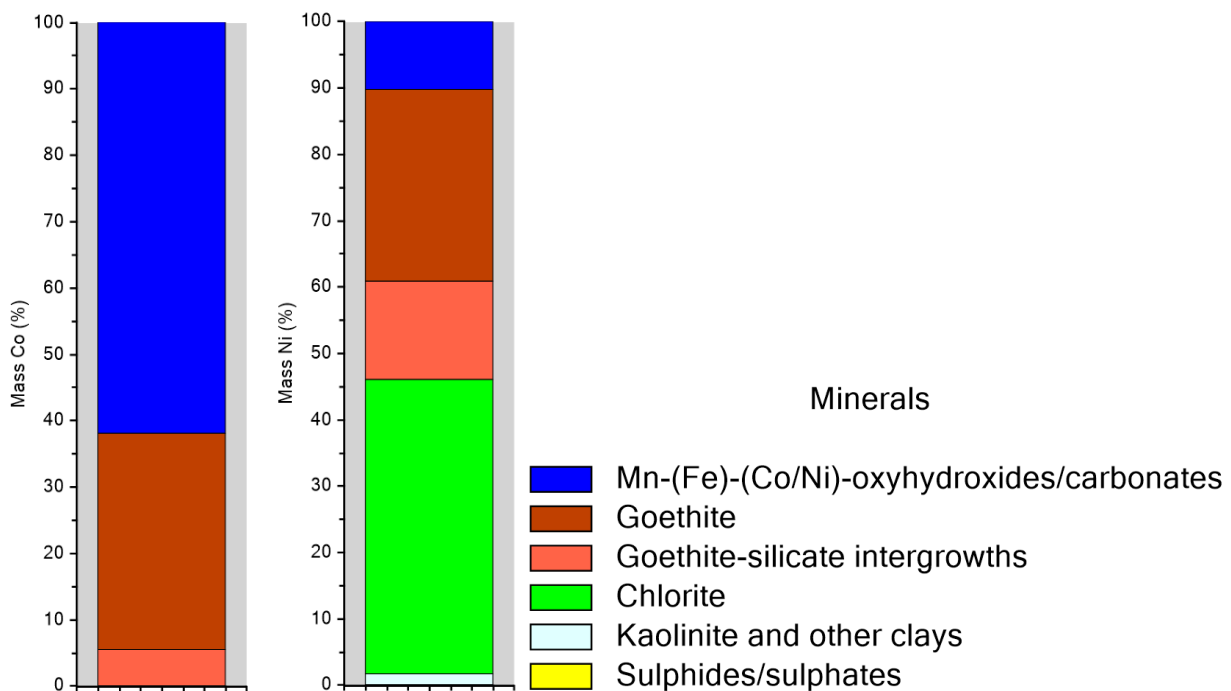


Figure 7 - QEMSCAN elemental department for Cobalt and Nickel

### 6.2 Test work

#### 6.2.1 Beneficiation

Beneficiation was evaluated as it had the potential to reduce the capital costs by allowing the size of the hydrometallurgical circuit to be reduced to account for the lower volume of leach feed and the higher percentage solids that can be pumped with a coarser beneficiated leach feed. The beneficiation concentrate was also expected to be richer in the target asbolane mineral that hosts the leachable cobalt. The beneficiation tail was also expected to contain more cobalt in fines, dominantly goethite, which is less easily leached.

The beneficiation testing successfully concentrated the asbolane mineral into the coarse fraction with approximately half of the feed mass recovered to concentrate. Cobalt grades variably increased to as high as 0.33% in the concentrate with nickel in concentrate reducing slightly below feed grades which is consistent

with the understanding of the mineralogy that has the cobalt concentrated in the asbolane and the nickel dispersed through the fines, especially in the goethite.

The beneficiation concentrates exhibited improved leach extraction of the cobalt to that of the Master Composite representing the first five years of production (refer Section 3.4) and other lower domain composites. Beneficiation did not improve the leaching extraction of cobalt for the upper domain. Nickel leach extractions were significantly higher for the beneficiation concentrates compared to the whole of ore leaches.

When the overall recovery for beneficiation and leaching are considered, the beneficiation case delivers significantly lower overall recoveries when compared to whole of ore leaching.

Economic modelling of the two options was completed internally by the MTJV.

It was concluded that in all cases the whole of ore leach case delivered higher relative financial returns. Even running sensitives on possible best-case beneficiation recoveries and leaching performance could not achieve materially higher NPVs than the whole of ore leach.

As well as the relative financial performance of the two options, the MTJV also considered other non-financial criteria around the risk of selecting the beneficiation option.

The MTJV therefore confidently selected the whole of ore leach case for the front-end go-forward flowsheet for the Project.

### **6.2.2 Leach Optimisation**

The recognition of two key leaching reactions in the SO<sub>2</sub> and O<sub>2</sub> leach has been instrumental in achieving higher extractions compared to those achieved in the 2017 Scoping Study. The first reaction is a reductive leach targeting the cobalt and nickel in the asbolane mineral. The second reaction is an acidic leach targeting the nickel and cobalt in the goethite mineral.

The acidic leach conditions have been achieved without the need for the addition of expensive supplemental acid. A by-product of the first reaction is the leaching of manganese, which is rejected in the downstream mixed cobalt-nickel sulphide precipitation. For the second reaction, iron is leached as a by-product, which does create a cost to remove this in the downstream process. Some earlier tests did achieve higher nickel extractions of up to 37% but there was a significant penalty of increased iron in solution which requires removal. Consequently, the bulk leaches have targeted the optimum economic balance between cobalt and nickel extraction extent balanced against operating costs associated with iron leaching and then subsequent removal.

### **6.2.3 Leach Variability**

Seventeen variability leach tests were conducted early during the PFS.

Initial variability leaches were conducted as SO<sub>2</sub> leaches open to air in the top of the leach vessel prior to the discovery of the importance of accurate control of SO<sub>2</sub> and oxygen concentrations and the differentiation of the initial fast reductive leach for the asbolane followed by the slower oxidative/acidic leach of the goethite. As such the initial leach tests underestimated the achievable cobalt extractions.

The variability leaches typically ran past the economic optimum iron extraction point of about 5 g/L. Additional iron leached beyond this point requires downstream oxidation and precipitation with limestone. As such they overestimated the practicably achievable nickel extractions.

Adjustments were therefore applied as discussed under Metal Recovery Regressions below.

### **6.2.4 Bulk Leaches**

Seven bulk leaches (approximately 20kg of dry sample at 40% solids; i.e. 50kg wet) have been completed. The bulk leaches are in addition to the 17 variability leaches, 24 optimisation leaches, 8 beneficiation leaches completed during the PFS, and 15 SO<sub>2</sub> leaches in the scoping study, bringing the total number of SO<sub>2</sub> leaches completed to 71, giving confidence in the final leaching method proposed for the study.

The bulk leach results are shown in Table 4 below.

Table 4 - Bulk Leach Results

Bulk Leach	Test ID	Co extraction (%)	Ni extraction (%)	Fe in sol'n (g/l)
1	HY7334	85.43	30.45	11.7
2	HY7460	82.52	27.38	1.3
3	HY7556	83.36	26.57	2.2
4	HY8147	83.74	36.85	13.0
5	HY8190	85.78	35.30	8.1
6	HY8189 (lower grade)	68.61	20.46	3.0
7	HY8369	85.35	30.05	7.4

Bulk Leaches 1-4 and 6 were completed on the Master Composite (0.18% Co) derived from 2016 RC drilling using pure SO<sub>2</sub> and O<sub>2</sub> gas, to allow the conditions to be accurately optimised.

Bulk Leaches 5 and 7 were conducted on the Master Composite (0.18% Co) using dilute SO<sub>2</sub> gas as intended to be used in Mt Thirsty operations. They delivered the highest cobalt and nickel extractions for a given iron extraction to date.

Bulk Leach 6 was on a lower grade composite (0.12% Co) derived from 2018 AC drilling that performed as expected (using pure SO<sub>2</sub> and O<sub>2</sub> gas) based on the variability leaches as plotted on Figure 8.

### 6.2.5 Limestone Characterisation

Limestone samples from Triple M Transport's Esperance limestone quarry were analysed for chemistry and neutralisation capacity. The samples were then used in the neutralisation tests.

### 6.2.6 Primary Neutralisation

Primary neutralisation (PN) tests were completed on the slurries from the first three bulk leach tests. These results showed that iron (III), aluminium, and silicon can be precipitated at this stage of the process with minimal losses in payable metals.

### 6.2.7 Continuous Counter-current Decantation (CCD)

Due to the bench-scale nature of the test work no CCD testing was performed. To prepare a suitable solution for downstream testing, PN slurry from bulk leach three was subjected to solids filtration, washing and solution dilution to simulate CCD washing with a 98% recovery of cobalt and nickel.

A sample of PN slurry was used for vendor thickening testwork to establish flocculant addition rates and achievable underflow densities.

Assumed losses in the CCD will remain at 2% for both payable metals, as per the 2017 scoping study. The CCD loss estimate can only be refined with continuous piloting, which will be part of forward work plan post PFS.

### 6.2.8 Secondary Neutralisation

Secondary neutralisation was also completed with minimal co-precipitation of cobalt and nickel. This stream is recycled to the leach for dissolution of payable metals, with any net loss included as part of the 2% CCD losses. As with the CCD, piloting testwork will refine these preliminary results.

### 6.2.9 Mixed Sulphide Product (MSP) Precipitation

Five sighter tests were completed on one litre solutions at 70°C. Sodium hydrosulfide (NaHS) addition was set at 107-125% of the stoichiometric requirement and sodium hydroxide (NaOH) addition was used to control pH

to a setpoint. The pH was increased gradually from 3.2 in the first test to 3.8 in the fifth test. Cobalt precipitation increased from 75.7% to 94.5% and nickel precipitation increased from 91.7% to 99.4% from the first to the fifth sighter test.

A bulk MSP test was then run using a 15-litre sample from the secondary neutralisation test with conditions of 70°C and pH 3.8. NaHS was added in excess at 164% of the stoichiometric requirement to ensure the target precipitation was achieved. Both cobalt and nickel precipitation exceeded 99.8%, demonstrating that minimal losses are achievable in mixed sulphide precipitation.

This is an improvement on previous assumptions for nickel losses during mixed sulphide precipitation, which have been revised downwards for the previously assumed 2% to the now demonstrated 1%.

Cobalt losses during mixed sulphide precipitation will remain as previously assumed at 2%.

### 6.2.10 Future Testwork

A future testwork program will be required to provide data for the plant and tailings facility design and reduce uncertainty around reagent consumptions and plant performance. Some key items are:

- Comminution testwork for ore feed and limestone grinding circuit requirements;
- Leach tests to optimise SO<sub>2</sub> and O<sub>2</sub> requirements for various feed compositions, opportunity to reduce operating costs further;
- Integrated pilot plant to demonstrate flowsheet performance, optimise MSP and manganese circuit conditions, and provide vendor samples for thickener and filtration testwork;
- Neutralised tailings production for tailings storage facility testwork.

## 6.3 Metal Recovery Regressions

Detailed multi-variate statistical analysis of the variability leaches considered correlations between metal extraction and feed grade. This was considered by geological domain and in a multi-element setting. However, it was determined that more complicated methods did not significantly improve correlations. It was concluded that the most diagnostic variable of leach extraction for both nickel and cobalt was the natural logarithm of cobalt feed grade. For cobalt and nickel, the regression has a correlation coefficient ( $r^2$ ) of 78% (Figure 9). A very high extraction outlier was removed from the nickel dataset improving the correlation coefficient to 88%.

The PFS regressions are adjusted to match Bulk Leach 7 which while it wasn't the highest extraction achieved, it did represent the culmination of the PFS test work program, including the optimisation of SO<sub>2</sub>/O<sub>2</sub> concentrations through the leach and is a realistic representation of what is thought to be achievable in a production environment. The cobalt extraction in Bulk Leach 7 was 7% higher than that predicted by the regression of the variability leach dataset. A positive 7% adjustment was therefore added to the regression for cobalt.

Similarly, the variability leaches for nickel extractions were also adjusted. Bulk Leach 7 stopped at the optimum iron extraction level, at which point there was lower nickel extraction than predicted by the variability regression. As such, the nickel extraction regressions were adjusted by negative 9%.

Checks were also applied so that no extraction could fall outside of a range of 0 to 100% for cobalt or 0 to 53% for nickel, being the maximum result achieved in the test work.

Finally, adjustments to the extraction regressions were made to get to the final recoveries after downstream losses. CCD losses are assumed as 2% for both cobalt and nickel and MSP losses are 2% for cobalt and 1% for nickel.

The metal recovery regressions are applied on a block-by-block basis within the mine planning software. The average cobalt and nickel recoveries over the life of mine are 74.3% and 22.3% respectively.



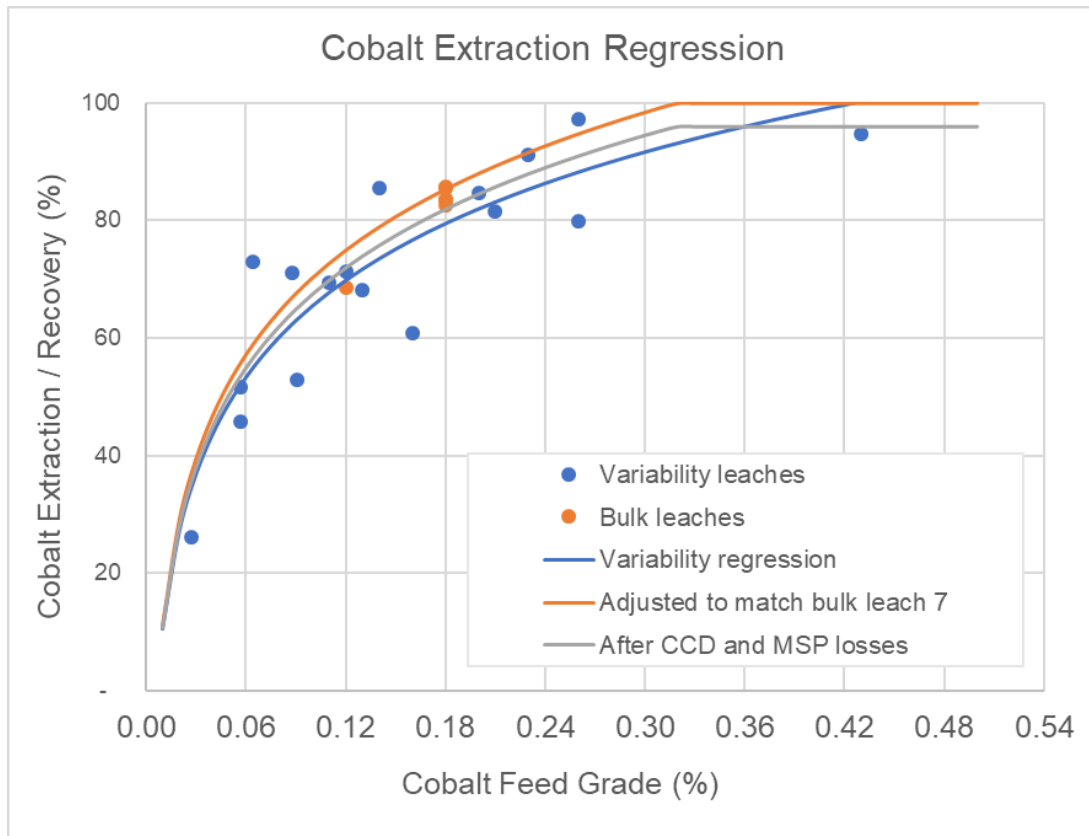


Figure 8 - Cobalt Recovery Regression

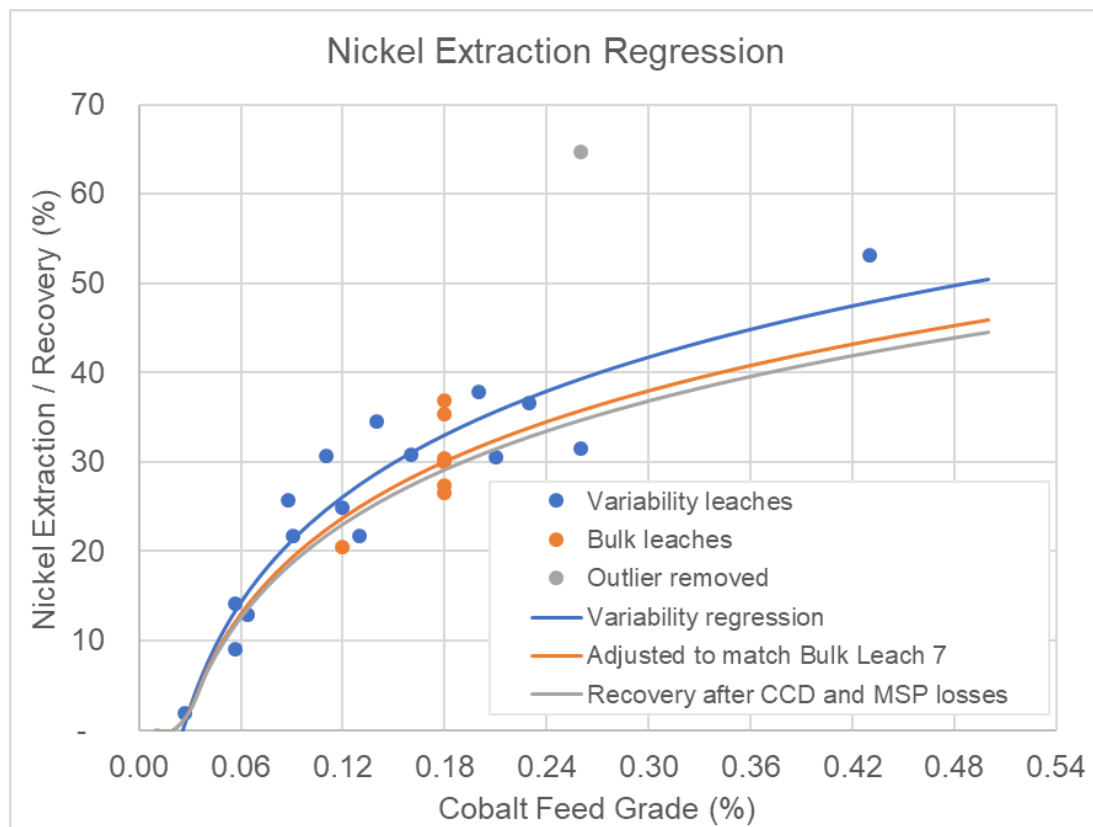


Figure 9 - Nickel Recovery Regression

## 7. MINING

Snowden Mining Industry Consultants Pty Ltd (Snowden) completed the mine planning for the Mt Thirsty Cobalt Nickel PFS, under the supervision of Mr Frank Blanchfield, Competent Person for the Ore Reserve.

### 7.1 Mining Method

The mining method is considered as conventional load and haul using off road trucks and excavators with significant free dig areas to the saprock. Pits up to 90 m deep may be possible depending on economic ore extraction. Pits were designed with an overall slope of 35 degrees and batters will vary between 30 and 55 degrees with berms at least every 10m. The ore will be mined in 5 x 2m flitches plus heave to accommodate selective mining and minimise ore dilution. Waste can be mined on benches up to 10m high.

Moisture contents within the saprolite are approximately 26% to 30%, hence the in-situ material is probably close to 100% saturation. This is likely to result in piezometric pressures within the horizon that may influence pit slope stability. However, the permeability of the material is likely to be very low, therefore it is anticipated that flows from the material into any bore or excavation will be negligible.

Drill and blast in the upper laterite layer outside the ore will utilise conventional drill rigs supplied by a mining service contractor.

### 7.2 Pit Designs

Snowden completed pit optimisation for both deposits (Mt Thirsty Main and Mt Thirsty North) using Whittle 4X software. A list of the parameters used is provided in Table 5.

Table 5 - Pit optimisation parameters

Parameter	Value	Comments
<b>Modifying Factors</b>		
Dilution	0%	Considered to be included in resource model with large blocks (10 mE x 25 mN x 2 mRL).
Ore loss	2%	Nominal allocation.
Overall slope angles	30° (25° near lease boundary)	Geotechnical assumptions and WA regulations for abandonment bunds.
Process recovery – cobalt	As illustrated in Figure 8	Based on test work, downstream losses and scale-up factors provided by Wood
Process recovery – nickel	As illustrated in Figure 9	Based on test work, downstream losses and scale-up factors provided by Wood
Payability – cobalt	80%	Marketing report by NC Chem
Payability – nickel	85%	Marketing report by NC Chem
<b>COSTS</b>		
Mining cost	\$4.96/t rock*	Based on mining contractor quotation.
Processing / administration	Fixed Component and Variable by Mn grade and payable metal in product	Estimate provided by Wood
Royalty – Ni / Co	5.32% of payable metal value	Incorporates state royalty, native title and Coastrange royalties
<b>Commodity Prices</b>		
Cobalt	US\$61,000/t	Marketing report by NC Chem
Nickel	US\$16,500/t*	Marketing report by NC Chem
Exchange rate	0.67 AUD/USD	Marketing report by NC Chem

\*Mining Cost averaged \$4.76/dmt once scheduled in detail and Nickel price revised upwards to US\$17,850/t in financial model based on marketing advice.

Pits were designed based on the revenue factor ‘1’ pit shells for both Mt Thirsty Main and Mt Thirsty North. Mt Thirsty Main was designed in 14 stages, with Mt Thirsty North having a single stage.

Trafficking will not be an issue on saprock benches; however, haul roads and ramps on wet saprolite will need sheeting with competent sub-base material. This could be laterite material from the hard cap.

The Mt Thirsty Main pit is split into stages. Figure 10 shows the stage numbering for the main pit. Mt Thirsty North consists of a single stage.

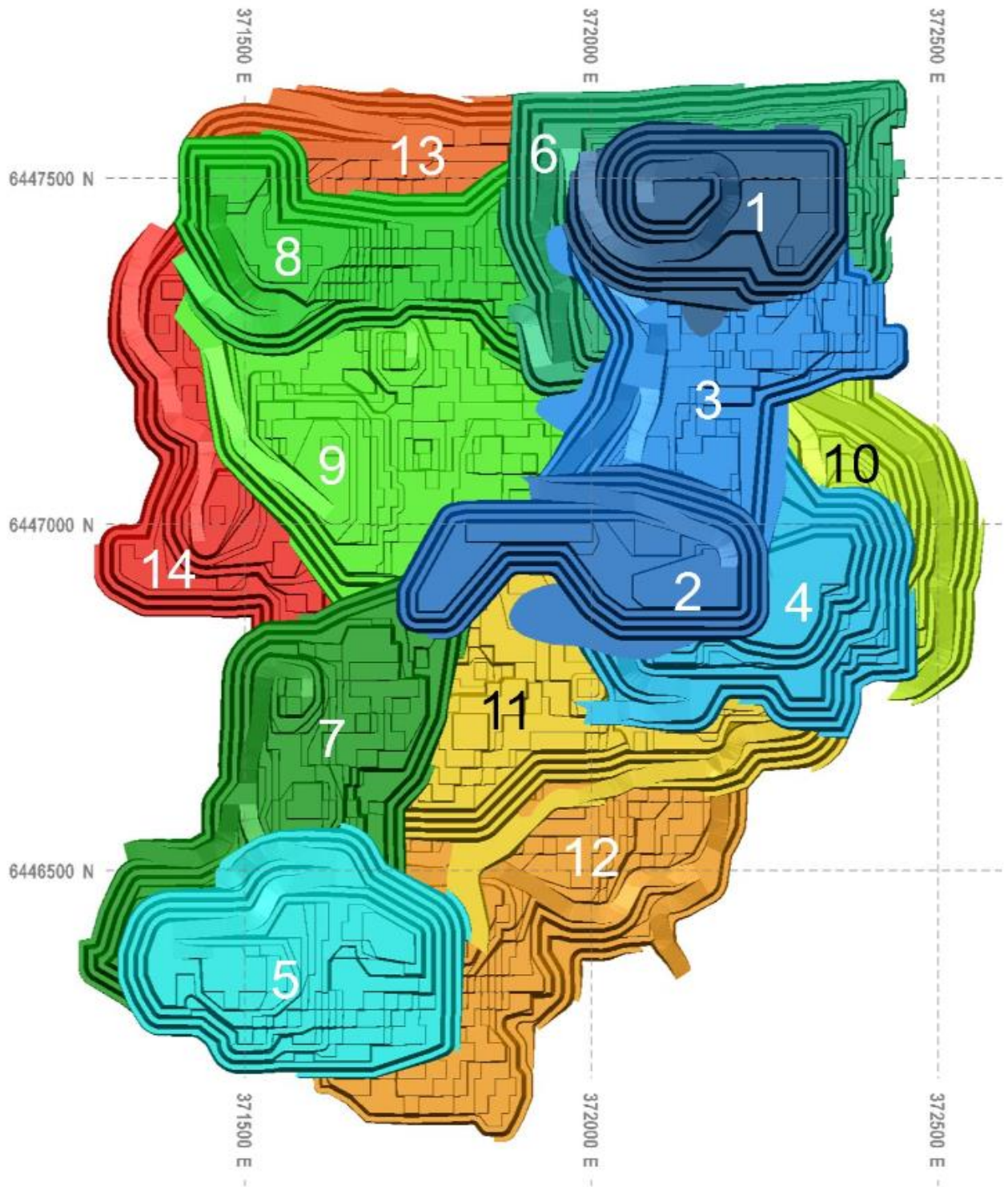


Figure 10 - Mt Thirsty Main Pit Stages

### 7.3 Mine Schedule

The physicals used in the schedule are shown in Table 6.

Table 6 - Life of mine plan physicals

Classification	Mass (Mt)	Co (%)	Ni (%)	Mn (%)
<b>Mt Thirsty</b>				
Probable Ore Reserve	18.8	0.126	0.54	0.80
Inferred Resources	1.0	0.128	0.52	0.87
Inferred %	5			
Waste	46.5		Strip ratio = 2.4 w:o	
<b>Mt Thirsty North</b>				
Inferred Resources	0.8	0.094	0.53	0.47
Inferred %	100			
Waste	2.0		Strip ratio = 2.5 w:o	
<b>Project Total</b>				
Probable Ore Reserve	18.8	0.126	0.54	0.80
Inferred Resources	1.8	0.112	0.53	0.69
Inferred %	9			
Waste			Strip ratio = 2.4 w:o	

A portion of the Production Target uses Inferred Mineral Resources and there is a low level of confidence associated with the Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the Production Target itself will be realised.

Quarterly scheduling was completed for the life of mine in Snowden's Evaluator schedule optimisation software. The schedule used 2 m vertical mining increments in the 15 design stages. Focus was placed on maximising revenue as early as possible by targeting the highest grades areas of the deposit. Constraints were placed on ore process throughput of 1.8 Mtpa with a limit to the Mn grade of 1.3%. A one-year ramp-up profile was applied.

Figure 11 demonstrates that the majority of the Inferred Resources are processed at the end of the mine life. The schedule is able to maximise grade in early periods, which accompanies higher recoveries during this time (Figure 12). The total mining rate of 8 Mtpa (dry) is required for the first five years of production, including a one-year pre-production period.

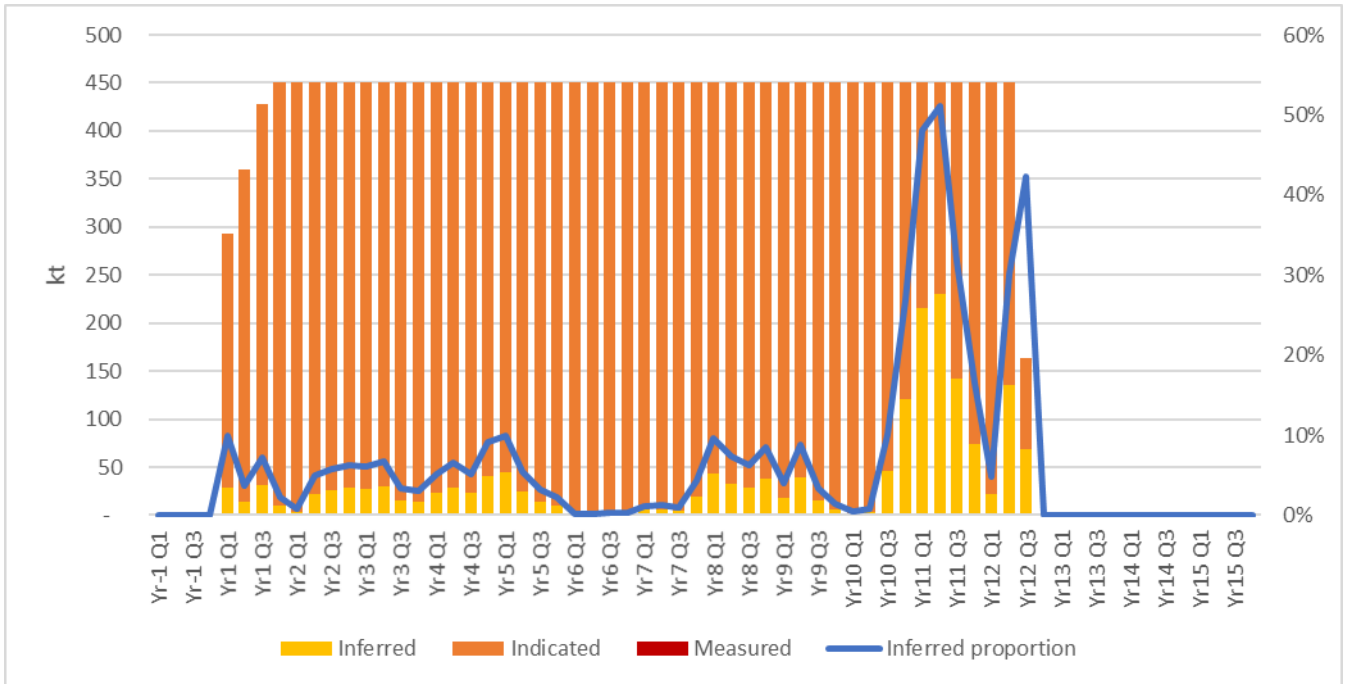


Figure 11 - Process throughput schedule by resource classification

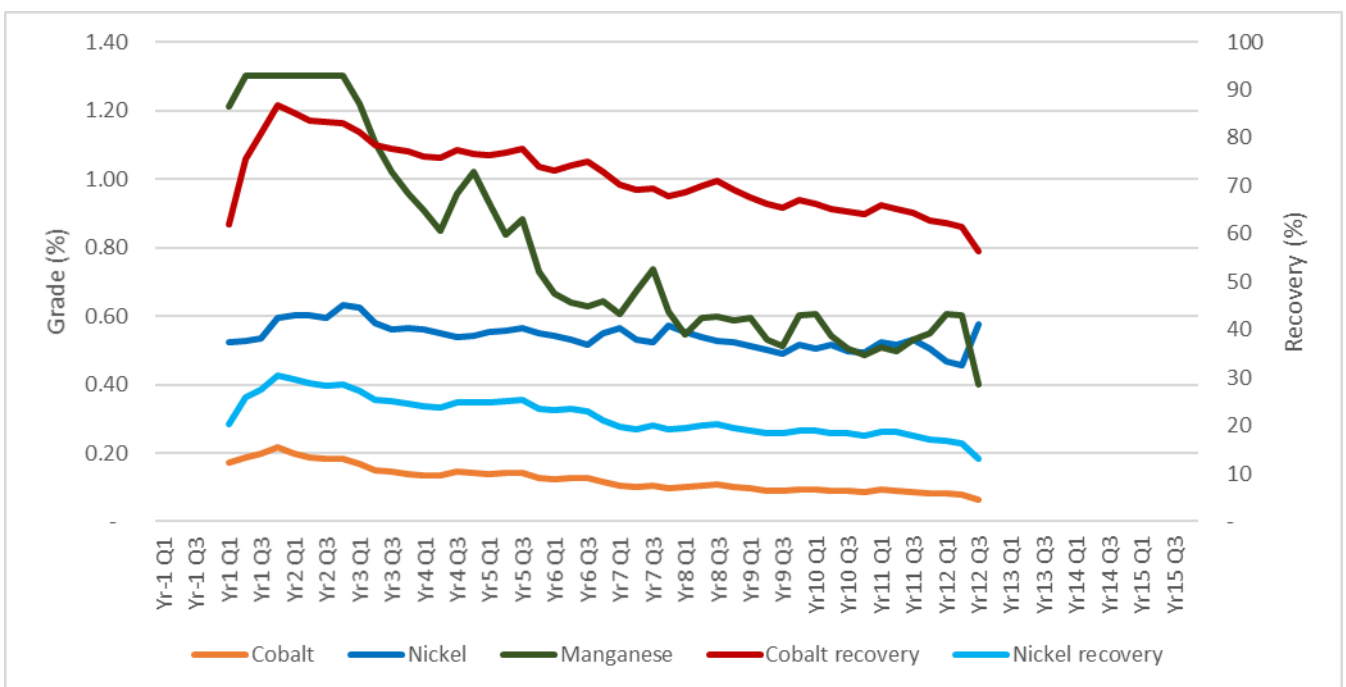


Figure 12 - Process input grade and overall recovery schedule

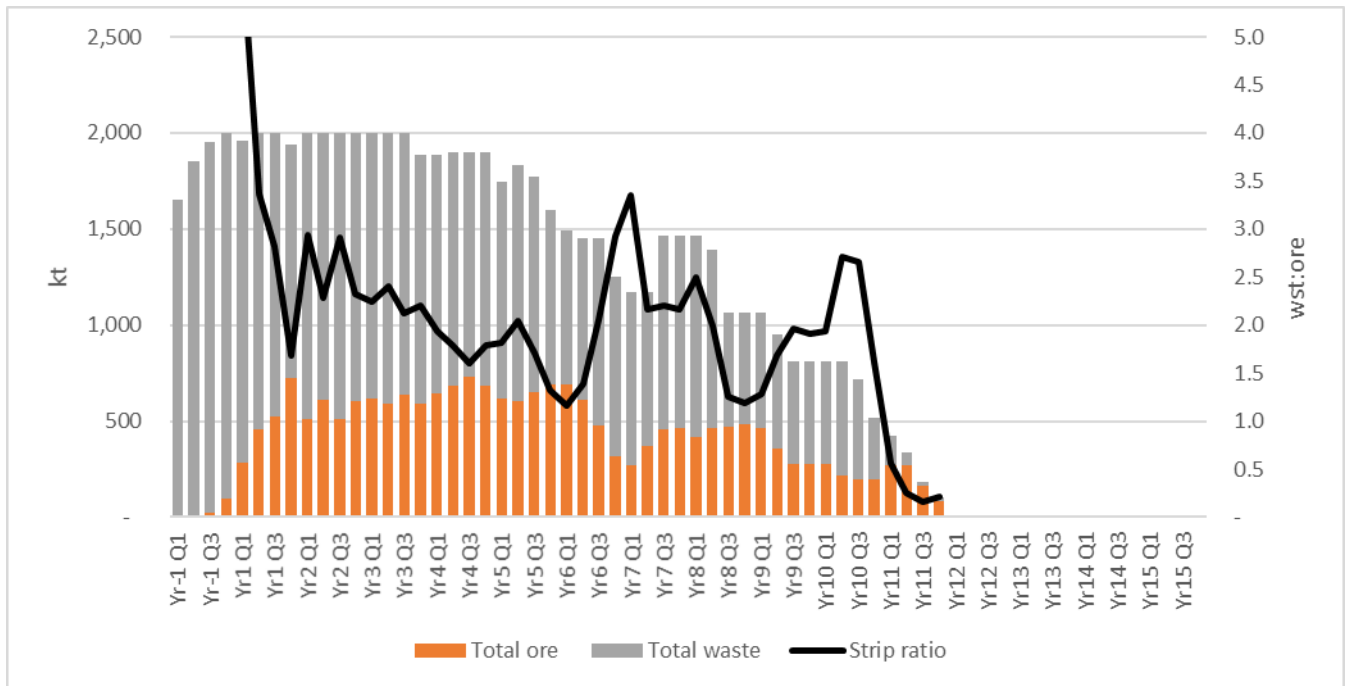


Figure 13 - Total mining movement schedule

An annual summary of the mine schedule is provided in Table 7.

Table 7 - Life of mine schedule summary

Item	Year													
	Total	-1	1	2	3	4	5	6	7	8	9	10	11	12
Total waste (kt)	48,612	7,325	5,908	5,770	5,452	4,855	4,388	3,556	3,717	3,142	2,264	1,972	264	-
Total ore (kt)	20,627	125	1,992	2,230	2,434	2,738	2,564	2,091	1,561	1,842	1,375	891	784	-
Mined cobalt (%)	0.12	0.21	0.18	0.15	0.13	0.12	0.12	0.12	0.11	0.10	0.10	0.10	0.10	-
Mined nickel (%)	0.54	0.52	0.55	0.60	0.57	0.54	0.53	0.52	0.52	0.53	0.50	0.50	0.54	-
Mined manganese (%)	0.79	1.46	1.26	1.04	0.90	0.80	0.75	0.61	0.68	0.58	0.57	0.51	0.46	-
Strip ratio	2.4	58.4	3.0	2.6	2.2	1.8	1.7	1.7	2.4	1.7	1.6	2.2	0.3	-
Stockpile size (kt)		125	587	1,017	1,651	2,589	3,353	3,644	3,405	3,448	3,022	2,113	1,097	33
Processed (kt)	20,594	-	1,530	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,064
Processed cobalt (%)	0.12	-	0.20	0.19	0.15	0.14	0.14	0.12	0.10	0.10	0.09	0.09	0.09	0.08
Processed nickel (%)	0.54	-	0.55	0.61	0.58	0.55	0.56	0.53	0.55	0.54	0.51	0.50	0.52	0.48
Processed manganese (%)	0.79	-	1.28	1.30	1.08	0.93	0.84	0.64	0.66	0.58	0.56	0.53	0.52	0.57
Inferred feed proportion (%)	9%	-	5%	4%	5%	6%	5%	0%	2%	8%	4%	10%	37%	21%
Cobalt recovered (kt)	19,007	-	2,345	2,843	2,135	1,911	1,884	1,636	1,271	1,296	1,114	1,051	1,021	501

Item	Total	Year												
		-1	1	2	3	4	5	6	7	8	9	10	11	12
Nickel recovered (kt)	24,845	-	2,249	3,154	2,689	2,397	2,466	2,179	1,930	1,911	1,695	1,668	1,691	816
Cobalt recovery (%)	74	-	78	84	79	77	76	74	69	70	67	65	65	61
Nickel recovery (%)	22	-	27	29	26	24	25	23	20	20	19	18	18	16

## 7.4 Mining Equipment

Open pit excavations and site construction work will be carried out by contractors. It is envisaged that the mining contractor will operate and maintain equipment under a schedule of rates style contract.

MACA Ltd and Hamptons Transport Pty Ltd both costed the Mt Thirsty Project Mine Plan.

The peak equipment list selected by MACA was as follows:

- 3 Leibherr 9200 200t excavators
- 1 Komatsu PC1250 120t excavator
- 18 Komatsu HD1500 150t trucks
- 4 Komatsu HD785 90t trucks
- 1 Komatsu WA600 Front End Loader
- 3 Caterpillar 16M Graders
- 3 Caterpillar D10 Dozers
- 3 Komatsu HD785 90t water trucks
- 2 Scania Service Trucks
- 3 Atlas Copco D65 Drills

## 7.5 Site Layout

Figure 14 shows the overall site mining layout.

The ROM, low-grade stockpile and waste dumps are placed to the west of the deposit. There is some opportunity to place waste in-pit later in the mine life to reduce haulage costs, and some waste is allocated to the construction of the TSF.



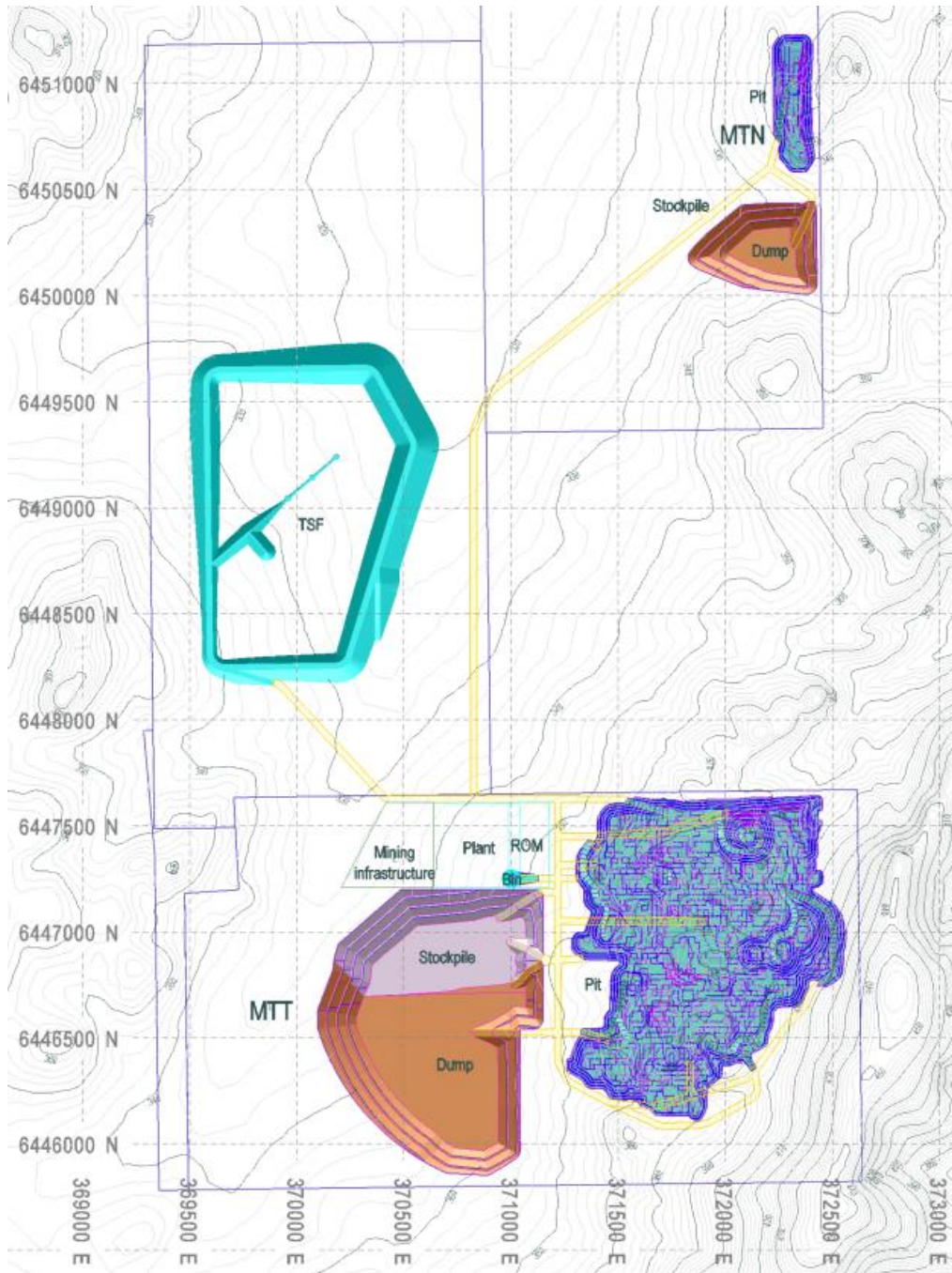


Figure 14 - Site Layout

## 8. ORE RESERVES

The below information is provided as a summary of information required for ASX Listing Rule 5.9.1.

### 8.1 Material Assumptions

The material economic assumptions in the PFS are as shown in Table 8 below:

*Table 8 - Material economic assumptions for the Ore Reserve and PFS*

Input	Assumption
Cobalt Price	US\$61,000/t
Nickel Price	US\$17,850/t
Cobalt Payable	80%
Nickel Payable	85%
Forex (AUD:USD)	0.67
Royalties (WA State Government, previous tenement vendor, and Native Title (yet to be finalised))	5.32%
Discount Rate (Pre-Tax Real)	8%
Australian Corporate Tax Rate	30%

### 8.2 Criteria for Classification

Ore Reserves have been classified as Probable Ore Reserves based on the input Indicated Mineral Resources that produced a positive NPV result when scheduled and costed in detail with all modifying factors taken into account.

The Ore Reserve was calculated using a schedule that considered only the Indicated Mineral Resources and assigned zero value to the Inferred Mineral Resources. This schedule still delivered a positive NPV. The PFS is based on a schedule that also includes Inferred Mineral Resources that are restricted to a maximum of 10% for any quarterly period in the first 10 years of operations.

### 8.3 Mining Method

The mining method will be by conventional open pit methods on 10m benches. Laterite (approximately 13% of mined rock) will be drilled and blasted. All other rock is expected to be free dig. The ore will be dug on 2m flitches and no blasting is necessary in the ore. No dilution was added as the resource model was considered pre-diluted. Ore loss was assumed at 2%.

### 8.4 Processing Method

The ore feed will pass through a static grizzly into a mineral sizer, prior to wet scrubbing in an open circuit SAG mill and then closed circuit grinding in a ball mill to meet a -53um leach feed specification. The ball mill cyclone overflow is thickened to 40% solids (in hypersaline process water) and leached at 70-90°C at atmospheric pressure using SO<sub>2</sub> and air. Sulphur will be imported and burnt in air to make sulphur dioxide that will be diluted with compressed air and sparged into the leach tanks at varying concentrations. The leached slurry will be primary neutralised with limestone and treated by counter current decantation before secondary neutralisation using limestone. The cobalt and nickel in the neutralised solution is recovered by mixed sulphide precipitation using NaHS and NaOH prior to filtering and product bagging. Manganese precipitation using sulphur dioxide and tailings neutralisation with limestone and lime complete the process.

Recovery factors for cobalt and nickel vary by cobalt head grade and the regressions are shown in Figure 8

and Figure 9.

## 8.5 Cut-Off Grades

The cut-off grade is determined on a block-by-block basis by Snowden's scheduling software after application of all revenue and cost assumptions, including reagent consumption that varies by manganese grade. It is approximately aligned with the nominal 0.06% cobalt cut-off used in the Mineral Resource Estimate.

## 8.6 Reserve Estimation Methodology

Ore Reserves, in accordance with JORC (2012) were estimated by reporting the Indicated Resource blocks within the pit designs that return a positive margin after comparing the revenue per block with the combined processing, admin and royalty costs. This varies depending on the Co, Ni and Mn grades. As Mt Thirsty North is entirely Inferred Resources it is not included in the Ore Reserve estimate. A total Probable Ore Reserve of 18.8 Mdt grading 0.126% Co, 0.54% Ni and 0.80% Mn is reported (Table 9). Full details of the Modifying Factors are reported in JORC Table 1. Although the financial model reported for this study included Inferred Resources, Snowden completed checks to ensure that the Project would provide a positive post-tax NPV with only Ore Reserves contributing to revenue.

## 8.7 Material Modifying Factors

There are not expected to be any impediments to finalising the land access and approvals for the Project. The tenements are in good standing and mining leases and miscellaneous licences have been applied for. The Project sits within the determined Ngadju Native Title claim and negotiations with the traditional Owners are well advanced.

Environmental Surveys have been completed with no rare plants or animals identified. The approvals pathway for the Project has been identified and will be managed by the WA mines department (DMIRS).

The Modifying factors that were used in the pit optimisation were also used for Ore Reserve estimate.

## 8.8 Ore Reserve Statement

The PFS now enables the Maiden JORC 2012 Probable Ore Reserve to be estimated for the Project as shown in Table 9 below:

*Table 9 - Mt Thirsty Ore Reserve estimate*

Mineral Resource	Cut-off (Co%)	Wet Tonnes (Mwt)	Moisture (% wet t)	Dry Tonnes (Mdt)	Co (%)	Ni (%)	Mn (%)	Fe (%)
<b>Mt Thirsty Probable</b>	Approx. 0.07% Co (Variable)	25.9	27%	18.8	0.126	0.54	0.80	21.6

## 9. PROCESSING

The flowsheet for the PFS is ostensibly unchanged from that proposed during the scoping study other than being increased in scale from 1.5 Mdt/tpa to 1.8 Mdt/tpa (dry) feed rate or 2.3Mwt/tpa (wet) to bring revenue forward and maximise the NPV of the Project. The basic process steps and PFS processing plant layout are shown in Figure 17, Figure 15 and Figure 17.

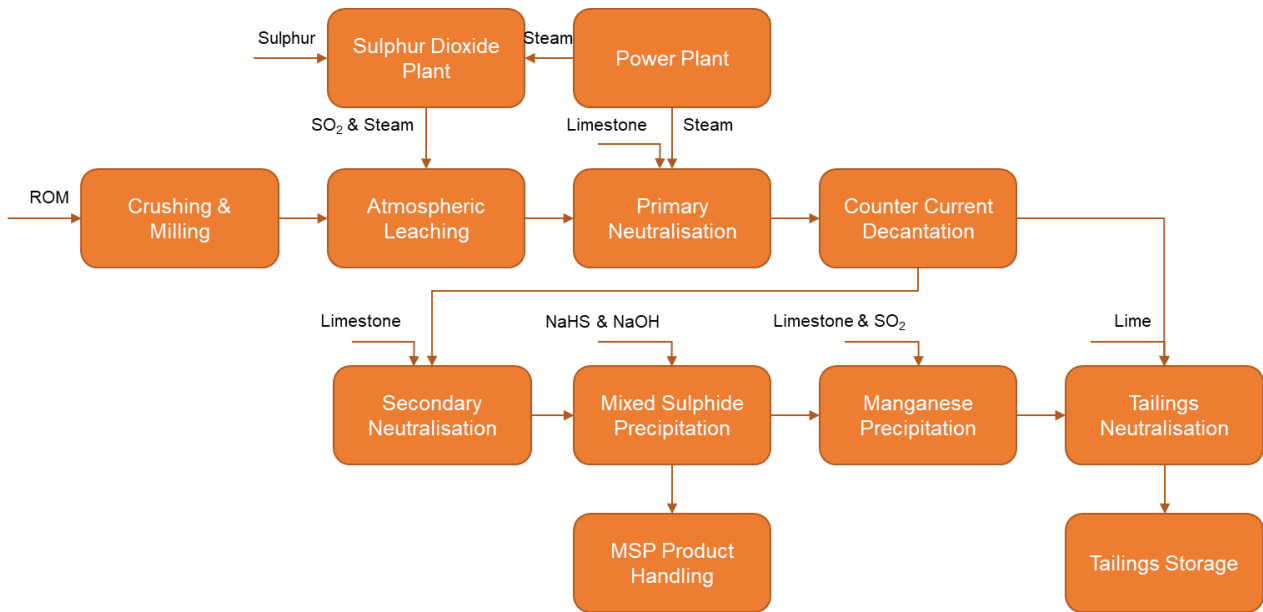


Figure 15 - Schematic Process Flowsheet for Mt Thirsty

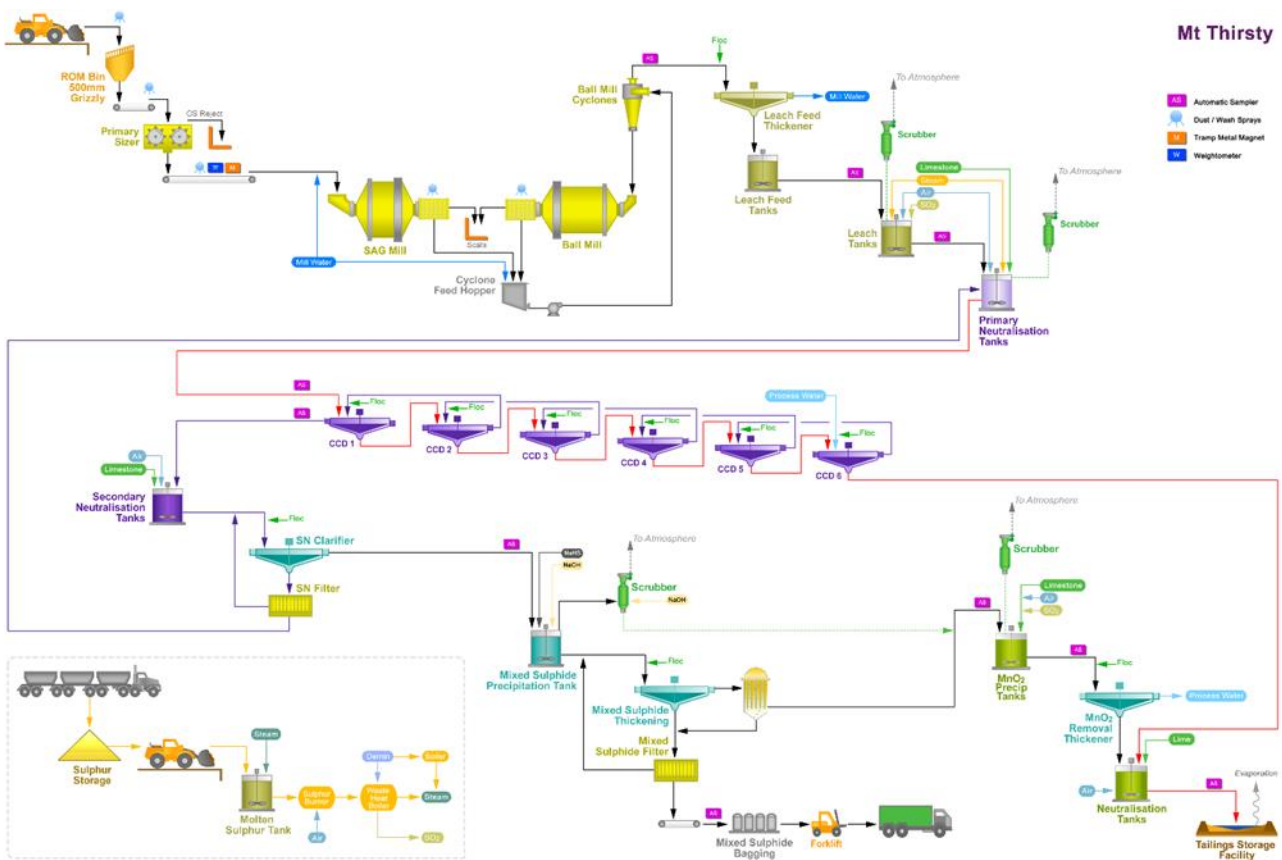


Figure 16 - Detailed Mt Thirsty Flowsheet



Figure 17 - 3D isometric of the Mt Thirsty processing plant showing generalised process flow (numbered labels)

The ramp up curve for the Project is shown in Table 10. It is aligned with the Type 1 McNaulty curves expected for properly planned and executed developments.

Table 10 - Mt Thirsty Ramp Up Curve

% Design	Q1	Q2	Q3	Q4
<b>Tonnes</b>	65%	80%	95%	100%
<b>Recovery</b>	75%	90%	95%	100%
<b>Product</b>	49%	72%	90%	100%

## 10. INFRASTRUCTURE

### 10.1 Regional Infrastructure

The Project is fortunate to be located only 16km north-west of Norseman and only 4km from the Coolgardie-Esperance Highway (part of the Trans-Australia Highway 1) (Figure 1). This infrastructure corridor includes road, rail, gas, water, fibre optic infrastructure, some of which will be useful to the Project.

### 10.2 Power and Steam

The power estimate for the Project is based on a build own operate solution to provide power. The Project will have a total installed power of 21.2 MW, drawing 12.4 MW at any one time. The power solution proposed is a combined diesel-solar power station. The power cost is a competitive 20.6 c/kwh.

Waste heat boilers will be utilised on both the sulphur dioxide plant and diesel generators to produce steam to heat the processing tanks.

### 10.3 Water Infrastructure

Bore fields will be established to obtain 1.8 GLpa of hypersaline water (assumed 4 times seawater) from paleochannels 16km from the Project. A local bore field to obtain 0.2GLpa of saline water from fractured rock aquifers (assumed 1 times seawater) will also be established.

### 10.4 Workforce Strategy, Accommodation and Flights

The Project workforce comprising around 300 construction workers at peak, up to 186 miners, 95 plant and administration workers will be a combination of fly-in fly-out, drive-in drive-out, and residential workers. At this stage it is assumed that the contract mining personnel and construction work force will primarily be Fly In Fly Out (FIFO) and the plant operators and administration workers will be Drive in Drive Out (DIDO) from nearby towns gold fields towns including Kalgoorlie and Esperance. Permanent FIFO workers will work on a roster of 14 days on 7 days off while DIDO and residential workers will work a 5/2/4/3 roster for day shift roles. DIDO shift workers will work a roster of 4 days on, 4 days off, 4 nights on, 4 nights off.

Preliminary discussions with the shire of Norseman have indicated a very strong preference to see a new accommodation village established in town, leveraging existing town infrastructure such as the workers mess, swimming pool, gymnasium and other community infrastructure within the town. A quotation for an all-in accommodation rate has been received from a 3<sup>rd</sup> party commercial camp operator also advancing discussions with the shire of Norseman.

### 10.5 Product Transport

The Project is expected to produce 9,530 dry tonnes per annum of MSP at the process design criteria specifications. Initially in the early years with higher grade ore feed, more product will be produced and in the later years with lower grade ore feed, less product will be produced (Figure 18). The product will be dried by filters on site to about 50% moisture and packaged in bulka bags, then loaded into sea-containers for ease of freight. The sea-containers can then be trucked to Australian end-users or exported via any one of several container ports in Western Australia. Due to the high value of the product per tonne, the cost and distance of freight is not a major consideration.

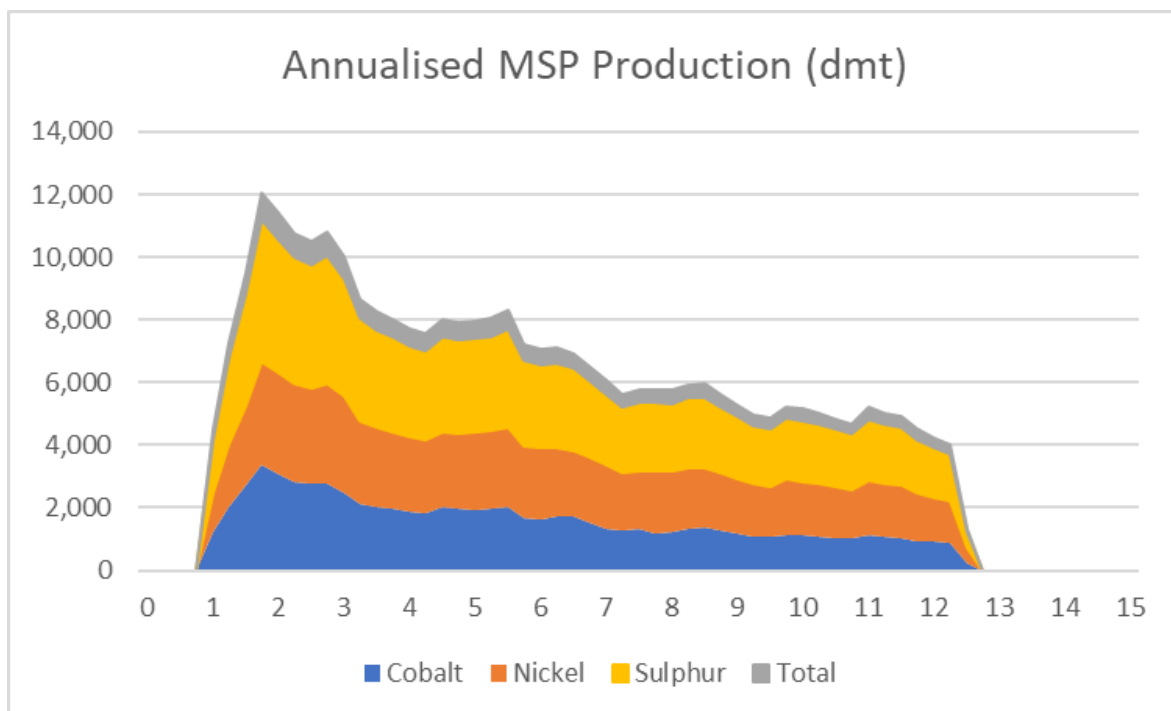


Figure 18 - MSP Production and Composition

## 11. TAILINGS

Golder Associates prepared a preliminary design of a tailings storage facility (TSF).

The proposed Mt Thirsty TSF is envisaged to be developed as a single storage cell and provide storage for approximately 21.6Mm<sup>3</sup> of tailings up to a maximum height of about 35m above natural ground level. At the planned tailings production rate of ~2 Mtpa and an average in-situ dry density of 1.0t/m<sup>3</sup>, the TSF is designed to provide storage for roughly 11 years of production. The deposited tailings will have a maximum surface area of approximately 1.1Mm<sup>2</sup>.

Tailings will be pumped to the TSF as slurry at a solids concentration of around 40% solids by mass and are expected to achieve a beach slope of 0.5%. Discharge into the TSF will take place through multiple spigots, spaced at about 200m centres, from around the TSF perimeter and from the decant access wall/ wing walls as required to manage the supernatant pond.

The supernatant pond will be located towards the centre of the TSF and around the pump-off decant system from where supernatant water will be returned to the process water pond for reuse in the process plant as needed. A decant causeway will provide access to a floating pontoon with barge pump which will be used to manage surface water from both normal and exceptional storm events. During normal operating conditions, the aim would be to maintain the size of the supernatant pond at approximately 10% of the TSF surface area.

The embankments will be constructed primarily using mine waste fill. Low permeability clay will be used as secondary embankment construction material to construct low permeability zones along the upstream slopes of the TSF embankments. The interface between coarse mine waste fill and the clay zone will be constructed from selected fine mine waste fill to provide a filter zone that will protect the facility from piping erosion. The floor of the TSF will be lined by ripping and compacting the in situ clayey materials. A foundation cut-off keyway has been provided to further limit the quality of seepage through the embankment and foundation.

As raising of the perimeter embankment will be done on an ongoing basis, construction verification will occur in the form of regular construction completion reports. As-constructed reports summarising the work completed in accordance with the embankment staging plan and compliance milestones should be submitted on a regular basis to the regulator (DMIRS). The aim of these reports is to document compliance of the construction process with the design specifications and requirements, but also to gain approval from the regulator to continue the tailings deposition. The construction summary reports (with as-built drawings) will be prepared and submitted in accordance with the DMIRS Code of Practice.

The total capital cost estimate to construct the proposed TSF impoundment is approximately AU\$27.1M (excluding harvesting of trees, clearing and grubbing, topsoil stripping, mechanical works and ancillary roadworks). This equates to approximately AU\$2.60 per dry tonne of future tailings generated by the Mt Thirsty Mine over ~11years of production. The total capital cost estimate associated with the first year of operation (starter embankment) is about AU\$9.5M (excluding site preparation, earthworks carried out by the mine fleet, piping, pumps and ancillary roads).

## 12. ENVIRONMENT AND APPROVALS

A reconnaissance flora and fauna survey was conducted by Spectrum Ecology at Mt Thirsty in spring 2018. The survey did not identify any rare plants or animals. Plants listed as priority flora were however identified and Malleefowl are known in the area. As such, a targeted flora and Mallee Fowl search was conducted over the tenements in spring 2019. No evidence of Malleefowl were found. Seven priority flora species were recorded.

Other environmental factors such as subterranean fauna, landforms, terrestrial environmental quality, inland waters, air quality and social surroundings are not considered to be materially impacted by the Project as assessed by Talis Environmental Consultants.

The likely approvals pathway for the Project will be:

- Native Vegetation Clearing Permit, Works Approval and Environmental Licence under the *Environmental Protection Act 1986*
- Licences to Construct Wells and Take Water under the *Rights in Water and Irrigation Act 1914*; and
- Mining Proposal under the *Mining Act 1978*.

These approvals should be able to be completed within 6 months.

All closure costs have been allowed for in the PFS. Allowance for rehabilitation of waste rock landforms and haul roads has been built into the load and haul rates in the operating cost estimate quotation from the mining contractor. For final infrastructure decommissioning, Wood have advised that the value of salvageable items of plant will net out the disposal cost of unsalvageable items and rehabilitation of the plant site.

## 13. CAPITAL COST ESTIMATE

The capital cost estimate for Mt Thirsty Cobalt – Nickel Project has an accuracy level of +/-25% and includes a 10% contingency on direct and indirect costs (Table 11).

The estimate includes costs for processing plant, supporting infrastructure including road upgrades, tailings compound, workshops, laboratory and administration offices.

The estimate, with a base date of 1st Qtr 2020 is supported by competitive budget pricing obtained from the market for contractor rates, major equipment and turnkey vendor packages. The balance of the estimate is factored as per AACE International and Wood internal guidelines. Mining and the associated mine support infrastructure are excluded from the capital estimate below and will be supplied as part of the mining contract.

For the purposes of the PFS, the costs for a Build, Own Operate (BOO) Power Station have been included in the operating cost estimate for the provision of site power.



Table 11 - Mt Thirsty PFS Capital Expenditure Estimate

		Estimated Cost (A\$M)
<b>Direct Costs</b>		
	Site Preparation	\$3.2
	Processing Plant	\$213.1
	Plant Infrastructure	\$20.4
	Area Infrastructure	\$6.5
	Miscellaneous	\$8.5
	First Fill and Spares	\$7.0
	Tailings Establishment	\$8.2
	<b>Total Direct Costs</b>	<b>\$266.9</b>
<b>Indirect Costs</b>		
	Construction Facilities	\$2.6
	EPCM and PCM	\$28.1
	<b>Total Indirect Costs</b>	<b>\$30.6</b>
<b>Growth Allowance</b>	9%	\$27.6
<b>Contingency</b>	10%	\$32.5
<b>Owner's Costs</b>	4%	\$13.0
<b>Total Capital Expenditure</b>		<b>\$370.7</b>

An amount of 1% of direct capital expenditure was added as an allowance for sustaining capital each year.

## 14. OPERATING COST ESTIMATE

The estimated average operating cost for the Project is estimated on the following basis:

- Process plant design criteria and mass balance for the first four years of plant operation
- Process plant mechanical equipment and electrical load list
- Labour costs from salary benchmark data and in-house data
- Vendor data/allowances for consumables
- Mining – MACA Ltd, Hampton Transport Services Pty Ltd quotations
- Lab - SGS Australia Pty Ltd, Bureau Veritas Pty Ltd quotations
- Tailings Lifts – Golder Associates Pty Ltd

- Camp – Tulla Group Pty Ltd, Civeo Corporation quotations
- Diesel – Caltex Australia Petroleum Pty Ltd quotation
- Reagents: supplier quotations, sulphur price supplied by MTJV analysis
- Power – Pacific Energy (KPS) quotation
- Freight – in house data

The average operating cost to produce 9,500 dry tonnes per annum of MSP concentrate is estimated at \$12,212 per tonne of concentrate. See Table 12 - Mt Thirsty PFS Operating Cost Estimate for the operating cost breakdown.

Table 12 - Mt Thirsty PFS Operating Cost Estimate

At Process Design Criteria Grades	A\$M pa	\$/dry feed tonne
<b>Mining (including Diesel, Labour and On-costs)</b>	28.8	15.99
<b>Grade Control</b>	1.2	0.67
<b>Tailings Lifts</b>	1.6	0.91
<b>Process Plant</b>		
<b>Labour</b>	13.8	7.69
<b>Power</b>	20.2	11.20
<b>MSP transport*</b>	0.8	0.42
<b>Miscellaneous (Lab, Accommodation, Vehicles, etc.)</b>	5.5	3.07
<b>Maintenance Materials</b>	6.3	3.51
<b>Consumables</b>	1.0	0.54
<b>General &amp; Administration</b>	0.9	0.48
<b>Reagents &amp; Grinding Media*</b>	37.5	20.84
<b>Total*</b>	<b>117.6</b>	<b>65.32</b>

\* Note that Reagents & Grinding Media and MSP transport costs vary block-by-block in the mine plan and year-by-year in the financial model based on the manganese grade and product tonnes. Over the life of mine reagent and grinding media costs average \$15.48/dmt feed and total operating costs average \$59.86/dmt feed due to lower manganese grades in later years. A breakdown of operating costs over the life of mine is shown in Figure 19.

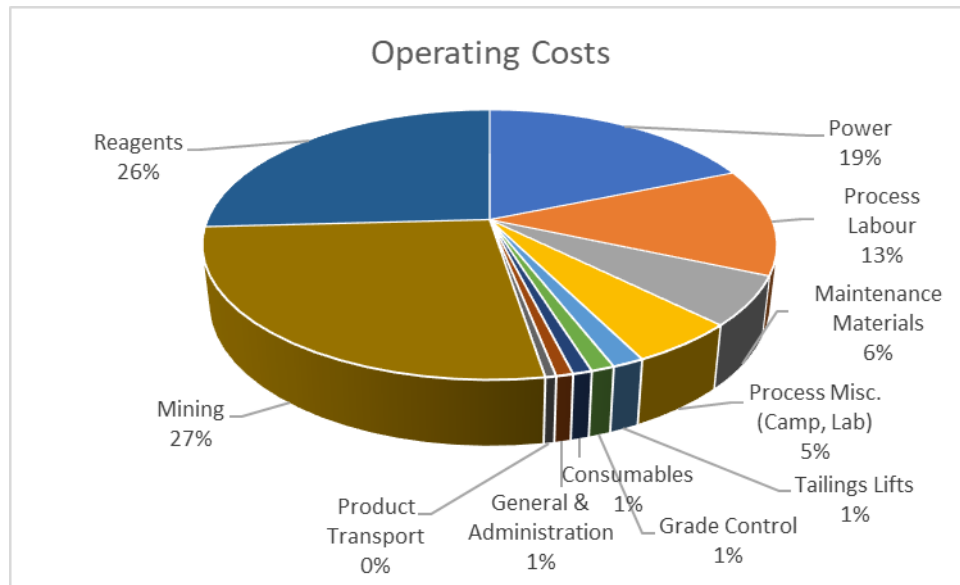


Figure 19 - Life of Mine Operating Cost Breakdown

## 15. MARKETING

The market assessment for the Project was prepared for the MTJV by Mr David Morgan, Principal of NC Chem Pty Ltd. Mr Morgan has been a successful senior marketer for nickel and cobalt metals, their associated intermediates, and specialty chemicals for more than 25 years. He has worked in Australia, London and Singapore for Queensland Nickel and BHP before working more recently as a consultant in the nickel and cobalt industry. He has specific experience buying and selling nickel and cobalt based intermediates and developing and marketing of nickel and cobalt precursor materials to Li-ion battery industry.

There are already many detailed reports and forecasts reviewing the future nickel and cobalt demand as a result of the impact of Li-ion battery and Electric Vehicle (EV) markets. This report assumes a base case where the EV market will grow from less than 2 million units in 2018 to 13million units by 2025 and the dominant cathode material used in EV's will be 811 NCM by 2022. This will result in the demand for primary cobalt for EVs increasing 10x by 2025 to 115 ktpa and demand for primary nickel for EVs increasing 4x to 520 kt. This report uses the consensus price forecasts by market players collated by Consensus Economics Inc. and Citi Research Report on EV Metals, to determine future prices for nickel and cobalt for the period 2022 to 2029.

For cobalt price the consensus trend is for a steady increase over the next few years, from the current spot level of US\$16.50/lb (US\$36,000/t), to an average of around US\$21/lb (US\$46,000/mt) by 2022 (nominal basis). The increase in the price has been influenced by the recent news that Glencore has placed its Mutanda operation (25 ktpa Co or 20% of total market) on care and maintenance. This brings forward the date when the cobalt supply-demand balance would go into deficit to 2020/21. For the period 2022-2029, analysts reported in Consensus Economics predict a wide range of prices from US\$16-35/lb (US\$35,500–77,000/t). The predicted price range for cobalt metal for the purposes of this report will be US\$20–35/lb (US\$44,000–77,000/t), giving an average price estimate of US\$27.50/lb (US\$61,000/t) for the period 2022 to 2029.

For nickel, the average (or consensus) in the shorter term is for the nickel price to gradually increase from current levels (US\$5.90/lb / US\$13,000/t) to approx. US\$7.30/lb (US\$16,100/t) by 2022 (nominal basis). The increase in price will be influenced by the increasing demand for class 1 nickel by the growing Li-ion battery demand and offset by the relatively low cost of production of class 2 Nickel Pig Iron (NPI) in Indonesia for stainless steel. For the period 2022-2029, analysts reported in Consensus Economics predict LME Cash price for nickel in the range of US\$7.00-8.90/lb (US\$15,420-19,620/t) with the mean ranging from US\$7.25-8.30/lb (US\$16,000-18,400/mt). The predicted price range for LME nickel price for the purposes of this report will be US\$7.25–8.15/lb (16,100–19,600/t), giving an average price estimate of US\$8.10/lb (US\$17,850/t) for period 2022 to 2029.

The Project has selected Mixed Sulphide Product (MSP) intermediate product as the preferred final product. The product contains 50:50 ratio of nickel to cobalt and is in the form of wet filter cake. Apart from the different Ni to Co ratio, this product is in a similar form to other impure nickel and cobalt intermediates already produced and refined into nickel and cobalt metals / chemicals. The average annual production rate of MSP product is forecast to contain 2,750 mtpa Ni & 2,350 mtpa Co. This represents about 0.1% of current nickel market and 2% of current cobalt market.

The current trade of impure Ni & Co containing intermediates most like the Mt Thirsty MSP are other MSP products (usually containing a lower ratio of Co) and Mixed Hydroxide Product (MHP). These products are currently sold to many different refineries around the world, particularly in China for the production of nickel sulphate ( $\text{NiSO}_4$ ) and cobalt sulphate ( $\text{CoSO}_4$ ) used to make precursor materials for the Li-ion battery cathode material.

The demand for  $\text{NiSO}_4$  for the Li-ion battery is expected to grow 2-3x by 2022 from the current level requiring approx. 90 ktpa of primary nickel. Currently approx. 15% of  $\text{NiSO}_4$  is produced from refined nickel metal and as a result the average premium for  $\text{NiSO}_4$  is about US\$1,500/mt Ni above the London Metal Exchange (LME) nickel price. The use of nickel metal and the resulting premium for  $\text{NiSO}_4$  is forecast to continue in the future due to shortage of other available feedstocks. Nickel based intermediates are a preferred feedstock for production of  $\text{NiSO}_4$  compared to using nickel metal. Use of class 1 metal as feedstock for production of  $\text{NiSO}_4$  has the highest relative cost and therefore the payables for intermediate feedstocks are likely to rise as  $\text{NiSO}_4$  demand further increases.

Taking into account the premium for  $\text{NiSO}_4$ , the equivalent reference price for suitable feedstocks for  $\text{NiSO}_4$  production can be considered to be US\$1,500/mt higher than the forecast LME price of US\$16,975/mt. This should allow higher payables for nickel-based intermediates. On this basis, it could be expected that the %Ni payable may be up to 85% by 2022.

The demand for cobalt won't grow as fast as the demand for  $\text{NiSO}_4$  in absolute terms due to the lower percentage of cobalt in cathode material for Li-ion battery for the EV applications but will increase to from 12kt in 2018 to 115 kt in 2025.

Cobalt is predominantly mined and refined as a by-product of copper and nickel operations. The cobalt market is relatively small (115 ktpa vs 2.5 million tpa for Ni) and hence is different to the nickel market. Over 70% of cobalt is produced as a by-product of copper and processed into intermediates in DRC in central Africa. The biggest intermediate product produced is crude cobalt hydroxide containing no nickel. The majority of this material is exported to China where it is refined into cobalt chemicals and a small amount of cobalt metal. The main chemical product produced is cobalt sulphate used in the production of cathode materials for the Li-ion battery. The other source of cobalt is from nickel based intermediate products in the form of MHP and MSP, but the quantities and amount traded in the market is much smaller.

The pricing of the cobalt component of nickel-cobalt intermediates will be increasingly influenced by the pricing / % payable of the crude cobalt hydroxide product predominantly sold to China. The cost to process the cobalt contained in the crude cobalt hydroxide is not directly related to metals prices and is somewhat a fixed price. In a deficit or balanced market (as forecast post 2022) with associated higher cobalt prices it would be expected that the % payable for cobalt to be higher and to be more related to the refining cost. At a cobalt price (FMB SG low Co price) of US\$27.50/lb (US\$61,000 /mt) the % payable could be as high as 85%.

The Mt Thirsty MSP is different to other MSP and MHP products in that it contains 50:50 ratio of Ni to Co compared to MHP / MSP produced from laterite ore containing 12:1 ratio of Ni to Co. It has higher levels of iron (Fe) and zinc (Zn) compared to other main nickel and cobalt intermediates (MSP, MHP & Crude Cobalt Hydroxide) but it is not envisaged this will be major issue with the marketing of the Mt Thirsty MSP.

In the future (post 2022) the most interested customers for Mt Thirsty MSP will be targeting to produce Nickel and Cobalt sulphate for the Li-ion battery industry. It is predicted the cobalt market will be in balance or a deficit and % payable for cobalt is likely to be higher than current levels and similar to nickel payable.

In the period 2022 to 2029 expect the following market conditions:

- Strong demand for  $\text{NiSO}_4$  &  $\text{CoSO}_4$  from the Li-ion battery / EV applications;

- NiSO<sub>4</sub> continue to be selling for a premium above the LME Ni price;
- Balanced to deficit market for both nickel & cobalt;
- Ni & Co containing intermediates will be the preferred raw material for production of Li-ion battery chemicals for EVs in particular NiSO<sub>4</sub> and CoSO<sub>4</sub>;
- Many refineries capable of treating Mt Thirsty MSP and with the higher Fe & Zn levels
- Forecast average price nickel (US\$16,975 /mt Ni) and cobalt (US\$27.50/lb or US\$61,000/mt) prices

Based on these forecasts, the estimate of % payables are 85% for nickel and 80% for cobalt contained in the Mt Thirsty MSP product.

Given the strong forecast growth of Li-ion batteries for EV's and the resultant demand for NiSO<sub>4</sub> and CoSO<sub>4</sub>, all producers of these chemicals will be looking for secure cost-effective supply of raw materials. By 2022 many of the existing sources of nickel and cobalt will be consumed and producers of these products will be looking for new sources. The potential customers for MSP will include traditional existing customers for Ni & Co containing MSP, refineries processing MHP and cobalt based refineries. In addition, likely to see the big players further up the supply chain (Li-ion battery manufacturers and EV OEM's) getting involved in sourcing Ni & Co containing raw materials.

The obvious target market for Mt Thirsty MSP will be producers of NiSO<sub>4</sub> and CoSO<sub>4</sub> for the Li-ion battery manufacturers. Whether the focus should be on the largest market China or the other markets with large EV OEM companies like Japan, Korea, Europe or USA will depend on the view of the success of Chinese owned HPAL projects in Indonesia. If successful, these projects could provide increased competition in the Chinese market for intermediates containing nickel and cobalt in the same time period (post 2022).

The marketing strategy for the MSP is very much related to investment in the Project and therefore needs to be investigated and addressed together. At this stage in the Project it is probably most important for potential investors to know there are plenty of refineries capable of refining this MSP into battery related chemicals.

## 16. FINANCIAL ANALYSIS

A financial model for the Project has been built based on the mine schedule reported in quarterly increments.

The input assumptions are as tabulated in Table 8 - Material economic assumptions for the Ore Reserve and PFS.

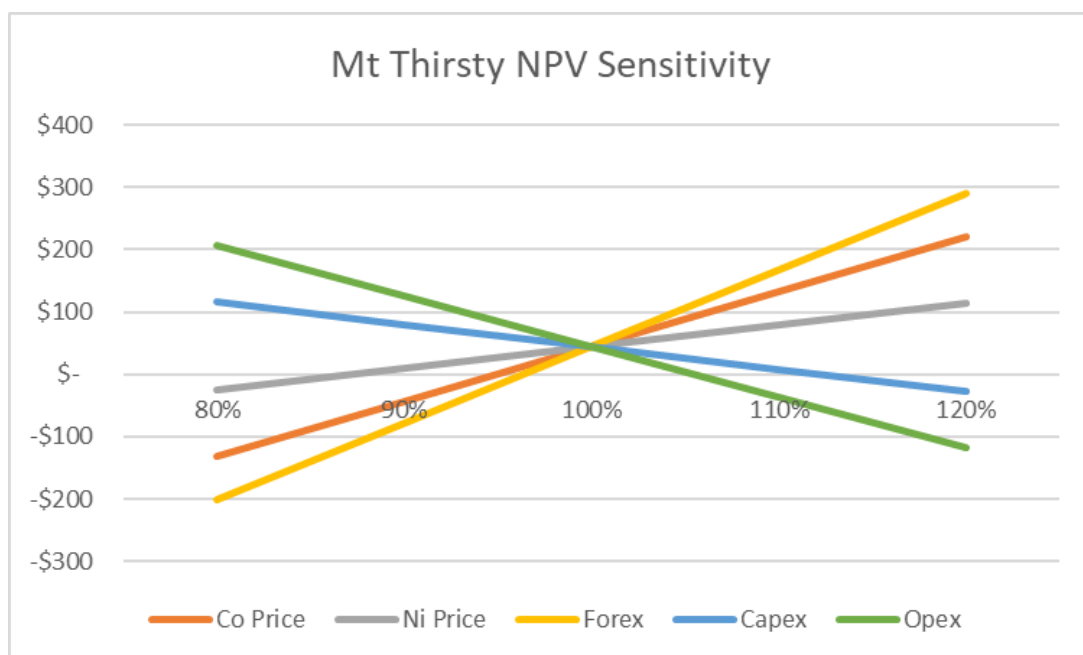


Figure 20 - Mt Thirsty NPV Sensitivity

An analysis of operating costs over the life of mine was also completed (Table 13). The All-In Sustaining Cost (AISC) is approximately aligned with the current depressed cobalt spot price.

Table 13 - Operating Cost Analysis

	US\$/t cobalt metal in product (LOM)
<b>C1 Cash Costs</b>	\$55,500
<b>Nickel Credits</b>	\$24,700
<b>Royalties</b>	\$4,600
<b>All-In Sustaining Costs</b>	\$35,400
<b>Depreciation</b>	\$16,300
<b>C3 Costs</b>	\$51,600

The financial analysis returned the following results:

- Life of Mine Revenue after Royalties \$1,848M (71% from Cobalt and 29% from Nickel)
- Life of Mine Operating Costs \$1,233M
- Life of Mine Cumulative Cash Flow \$213M
- Pre Tax NPV \$44.4M
- Post Tax NPV \$25.7M

## 17. RISK

Risks and opportunities have been drawn from the various sections of the prefeasibility study (PFS) and collated. The risk register context was developed in consultation with stakeholders focusing on the following key focus areas:

- Health, safety and environmental (HSE) including organisational management, human resources and industrial relations
- External to operations including regulatory, approvals and community relations
- Technical including process, technology, scope of work, schedule and estimates
- Execution including engineering, procurement, construction, commissioning, ramp-up and operation
- Opportunities.

The final risk register comprised 81 risks identified with two very high residual risks remaining after mitigation actions were applied. Both risks are classified under the external, regulatory or approvals and community relations focus area and relate to the potential of low commodity prices on the Project economics as well as the difficulty in the current market with funding projects.

## 18. VALUE OPTIMISATION OPPORTUNITIES

### 18.1 Inclusion of a Manganese Product

The leaching process to be employed at Mt Thirsty is very effective at leaching the manganese in the ore. More than 120,000 tonnes of manganese will be leached over the life of the mine. The base case flowsheet has this manganese being precipitated as an oxide to go to tails and allow the process water to be recycled. There remains an opportunity to make a product from this manganese either as an oxide, or higher value carbonate or sulphate products. Test-work is underway to investigate this opportunity as a potential value add to the base case PFS.

### 18.2 Addition of a Cobalt Sulphate and Nickel Sulphate circuit

The MTJV has selected a product strategy to produce an intermediate product to realise 80-85% payability on metal prices. This will keep the on-site operation relatively simple and also leave some value available for likely Project partners who may wish to take the next value adding processing step elsewhere in Western Australia or overseas.

However, many other nickel-cobalt projects within Australia have elected to include Nickel and Cobalt Sulphate plants in their base case. This remains as a future value adding initiative for the Project.

## 19. NEXT STEPS

The Mt Thirsty Joint Venture (MTJV) has identified the highest value development path to be a farm-in from a large global firm, eager to secure a guaranteed sustainable source of cobalt.

The direct Project expenditure for the MTJV now reverts to a minimum while the partnering strategy is pursued as planned.

The MTJV is now re-engaging with several major Australian and international mining, trading and refining firms who have all identified a high quality PFS as their minimum investment criteria.

## 20. COMPETENT PERSONS' STATEMENT

Table 14 - Competent Persons for the Mt Thirsty Cobalt Nickel Project

Discipline	JORC Section	Competent Person	Employer	Professional Membership
<b>Geology</b>	Exploration Results and Mineral Resources	Michael J Glasson	Tasman Resources Ltd; Consultant to MTJV; holds shares in Conico Ltd	MAIG
<b>Resource Estimation</b>	Mineral Resources	David Reid	Golder Associates Pty Ltd	MAusIMM
<b>Metallurgy</b>	Exploration Results and Ore Reserves	Peter Nofal	AMEC Foster Wheeler Pty Ltd trading as Wood	FAusIMM
<b>Mining</b>	Ore Reserves	Frank Blanchfield	Snowden Mining Industry Consultants Pty Ltd	FAusIMM

The information in this report that relates to Exploration Results, Mineral Resources and Ore Reserves for the Mt Thirsty Cobalt-Nickel Project is based on and fairly represents information compiled by the Competent Persons listed in Table 14. The Competent Persons have sufficient relevant experience to the style of mineralisation and type of deposits under consideration and to the activity for which they are undertaking to qualify as a Competent Person as defined in the JORC Code (2012 Edition). For new information, the Competent Persons consent to the inclusion in the report of the matters based on their information in the form and context in which it appears. Previously announced information is cross referenced to the original announcements. In these cases, 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.

## 21. JORC TABLE 1

### 21.1 Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

JORC Code explanation	Commentary
<p><b>Sampling techniques</b></p> <p><i>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i></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> <p><i>Aspects of the determination of mineralisation that are Material to the Public Report.</i></p> <p><i>In cases where 'industry standard' work has been done this would be relatively simple (eg '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</i></p>	<ul style="list-style-type: none"> <li>1m samples were split and collected at the drill rig.</li> <li>The remainder of the drill cuttings were immediately bagged and sealed in airtight bags to minimise drying and agglomeration of the clays. These samples were later used for compositing and metallurgical test-work.</li> <li>The split samples were then dried and pulverised and a 40gm sub sample analysed for Co, Ni, Mn, Zn, Mg, Al &amp; Fe using a four-acid digest with an ICP OES finish.</li> </ul>



JORC Code explanation	Commentary
<p>commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.</p>	
<p><b>Drilling techniques</b></p> <p><i>Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).</i></p>	<ul style="list-style-type: none"> <li>• RC drilling was completed with a 165mm face sampling hammer.</li> <li>• AC Drilling was completed with a 102mm blade bit. The cuttings are lifted to the surface up the inner tube of the drill bit in the same manner as RC drilling.</li> <li>• All drilling was above the water table and there was no water injection used.</li> </ul>
<p><b>Drill sample recovery</b></p> <p><i>Method of recording and assessing core and chip sample recoveries and results assessed.</i></p> <p><i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i></p> <p><i>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.</i></p>	<ul style="list-style-type: none"> <li>• Sample recovery was generally excellent in dry powdery clay which 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>• The cyclone was cleaned between each six-metre rod (RC) and three-metre rod (AC) and every metre for wet samples; riffle splitters were cleaned as required. 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><i>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.</i></p> <p><i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i></p> <p><i>The total length and percentage of the relevant intersections logged.</i></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>• All holes were logged in the field by MTJV geologists who have a long association and familiarity with the deposit.</li> <li>• Logging is qualitative in nature.</li> <li>• The entire length of each hole was logged in 1m intervals.</li> </ul>
<p><b>Sub-sampling techniques and sample preparation</b></p> <p><i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></p> <p><i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></p> <p><i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></p> <p><i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i></p> <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>• All RC drill chips were split with a rotary splitter. The remaining sample was bagged and placed on the ground.</li> <li>• Sample preparation followed industry standard practice of drying, coarse crushing to -6mm, before pulverising to 90% passing 75 micron.</li> <li>• To meet QAQC requirements duplicates were placed at irregular intervals in the sample stream, usually one or two duplicates per drill hole (approximately every 20-40m). For the RC drilling certified blanks (OREAS 24P) were placed in the sample stream at the rate of 1 in 100, at each hundredth sample. Additionally, two different certified standards were used in the sample stream (OREAS 72A and OREAS 162) at the rate of 2 standards per 100 samples. These were placed at the 25th and 75th number of every hundred samples.</li> <li>• The Co values in the blank samples were higher than the provided values however they are below 80 ppm; comparatively low compared to the estimated resource values and therefore within acceptable ranges for blank samples. Overall there were only a small number of outliers in the duplicates collected and therefore the duplicate results are also considered satisfactory.</li> <li>• Material being sampled is generally fine grained, and a 2-3kg 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</i></p>	<ul style="list-style-type: none"> <li>• Samples were crushed and pulverised, and analysed for Co, Ni, Mn, Zn, Mg, Al &amp; Fe using a four-acid digest with an ICP OES finish (method AD02-ICP) by Bureau Veritas'</li> </ul>

JORC Code explanation	Commentary
<p>considered partial or total.</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 (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i></p>	<p>Perth laboratory. These procedures are considered appropriate for the elements and style of mineralisation. Analysis is considered total.</p> <ul style="list-style-type: none"> <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>A limited number of twinned RC holes and AC holes twinned by Sonic Core (SC) holes have been drilled. 5 of the 6 RC holes and the 3 AC metallurgical holes are twins of previous AC holes. Analysis of paired data representing AC and SC samples with proximity of approximately 5 m or less has given at least preliminary indications that some AC samples are yielding higher Co and Mn values than corresponding samples derived from SC. Population statistics however show the reverse and AC statistics are slightly lower grade on average than RC and SC.</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 down-hole 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 handheld GPS and are accurate to approximately +/- 3m.</li> <li>The grid system used is AGD84; AMG Zone 51 to match a previously established grid. A DTM and 2.5m 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 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>	<ul style="list-style-type: none"> <li>All holes were sampled and assayed in 1m intervals and no other compositing has been applied during sample collection and assay 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>The mineralisation is mostly contained within a flat lying weathering blanket and vertical holes achieve unbiased sampling in most cases.</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 or reviews</b></p> <p><i>The results of any audits or reviews of sampling techniques</i></p>	<ul style="list-style-type: none"> <li>No audits or reviews were carried out for this metallurgical drilling as it is not considered warranted at this stage.</li> </ul>

JORC Code explanation	Commentary
and data.	

## 21.2 Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

JORC Code explanation	Commentary																																																															
<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 Project, located approximately 16km north west 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 exploration results referred to in this announcement are located on R63/4.</li> <li>A NSR royalty is payable to a third party on any production from R63/4. 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 1990's Resolute-Samantha discovered high grade cobalt mineralisation in the oxidised profile above an orthocumulate peridotite. This oxide mineralisation is the subject of this announcement.</li> </ul>																																																															
<p><b>Geology</b></p> <p><i>Deposit type, geological setting and style of mineralisation.</i></p>	<ul style="list-style-type: none"> <li>The Mt Thirsty Cobalt 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> <p><i>easting and northing of the drill hole collar</i></p> <p><i>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i></p> <p><i>dip and azimuth of the hole</i></p> <p><i>down hole length and interception depth</i></p> <p><i>hole length.</i></p> <p><i>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</i></p>	<ul style="list-style-type: none"> <li>Test work during the scoping study was completed on a Master Composite made up from Reverse Circulation (RC) drill samples from six holes collected in November 2016 (refer ASX Quarterly Report for December Quarter 2016). The Master Composite was made up of a blend of approximately half upper saprolite domain (upper) and half lower saprolite domain (lower) at grades representative of the most important early years of the mine plan.</li> <li>Over the entire Mineral Resource, the upper domain accounts for 13% and the lower domain accounts for 87% of the available tonnes. As part of this PFS, composites for the upper and lower domains at grades representative of the early years in the mine plan have been blended from these same RC samples from 2016.</li> <li>Additionally, three Air Core (AC) drill holes were drilled in August 2018 to collect fresh samples for beneficiation test work. These samples were also blended into upper and lower composites, although at grades representative of the overall Mineral Resource averages for those domains.</li> </ul> <table border="1"> <thead> <tr> <th>Hole ID</th> <th>Date Drilled</th> <th>Easting</th> <th>Northing</th> <th>RL (m)</th> <th>Depth (m)</th> <th>Composite Intervals (m)</th> </tr> </thead> <tbody> <tr> <td>MTRC036</td> <td>20/11/2016</td> <td>372162</td> <td>6447455</td> <td>378</td> <td>54</td> <td>18-42</td> </tr> <tr> <td>MTRC037</td> <td>19/11/2016</td> <td>372244</td> <td>6447455</td> <td>376</td> <td>30</td> <td>13-30</td> </tr> <tr> <td>MTRC038</td> <td>19/11/2016</td> <td>372349</td> <td>6447457</td> <td>369</td> <td>35</td> <td>14-28</td> </tr> <tr> <td>MTRC039</td> <td>20/11/2016</td> <td>371956</td> <td>6447000</td> <td>382</td> <td>40</td> <td>14-34</td> </tr> <tr> <td>MTRC040</td> <td>20/11/2016</td> <td>372115</td> <td>6447001</td> <td>393</td> <td>40</td> <td>30-36</td> </tr> <tr> <td>MTRC041</td> <td>20/11/2016</td> <td>372295</td> <td>6446999</td> <td>381</td> <td>35</td> <td>23-32</td> </tr> <tr> <td>MTAC798</td> <td>14/08/18</td> <td>372300</td> <td>6447251</td> <td>377</td> <td>30</td> <td>3-5 8-10 16-26</td> </tr> <tr> <td>MTAC799</td> <td>14/08/18</td> <td>372121</td> <td>6446846</td> <td>392</td> <td>60</td> <td>35-48</td> </tr> </tbody> </table>	Hole ID	Date Drilled	Easting	Northing	RL (m)	Depth (m)	Composite Intervals (m)	MTRC036	20/11/2016	372162	6447455	378	54	18-42	MTRC037	19/11/2016	372244	6447455	376	30	13-30	MTRC038	19/11/2016	372349	6447457	369	35	14-28	MTRC039	20/11/2016	371956	6447000	382	40	14-34	MTRC040	20/11/2016	372115	6447001	393	40	30-36	MTRC041	20/11/2016	372295	6446999	381	35	23-32	MTAC798	14/08/18	372300	6447251	377	30	3-5 8-10 16-26	MTAC799	14/08/18	372121	6446846	392	60	35-48
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JORC Code explanation	Commentary														
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<p><b>Data aggregation methods</b></p> <p><i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg 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 (eg 'down hole length, true width not known').</i></p>	<ul style="list-style-type: none"> <li>• As the mineralised envelope 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>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</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</i></p>	<ul style="list-style-type: none"> <li>• Metallurgical testwork has included Beneficiation, Leach Optimisation, Leach Variability, Bulk Leaches, Limestone Characterisation, Primary Neutralisation, Secondary Neutralisation, MSP Precipitation. The test work was all completed at ALS</li> </ul>														

JORC Code explanation	Commentary
<p>including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</p>	<p>Balcatta laboratory under the supervision of Process Engineers from Amec Foster Wheeler Pty Ltd (Wood)</p>
<p><b>Further work</b></p> <p><i>The nature and scale of planned further work (eg 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>	<ul style="list-style-type: none"> <li>• A PFS has been completed at Mt Thirsty</li> </ul>

### 21.3 Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in the preceding sections also apply to this section.)

JORC Code explanation	Commentary
<p><b>Database Integrity</b></p> <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>	<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><b>Site Visits</b></p> <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>	<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><b>Geological Interpretation</b></p> <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>	<ul style="list-style-type: none"> <li>• A mineralisation interpretation for the Mt Thirsty Cobalt deposit was completed by MTJV personnel on hardcopy cross-sections and used to validate 3D computer modelling.</li> <li>• Sample data analysed using K-means Clustering to group data into like domains. This is checked against dominant logging codes.</li> <li>• K-means Clustering results are loaded into Leapfrog geological modelling software. Interpretation is in section then wireframed into 3D shapes using Leapfrog's in-built modelling tools.</li> </ul>

JORC Code explanation	Commentary
<p><b>Dimensions</b></p> <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 2.5 km and a maximum plan width of about 900m. The portion held by the MTJV is the southern 1.8 km of strike length contained within R63/4.</li> <li>The Mineral Resources Estimates have been constrained by tenement boundaries.</li> </ul>
<p><b>Estimation and Modelling Techniques</b></p> <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 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>	<ul style="list-style-type: none"> <li>The block dimensions for the Mt Thirsty Cobalt 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, Mg, Zn, and Al using 1 m composites. Grade estimation was completed in three passes.</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 10 x 25 x 2 m. No sub-celling is used.</li> <li>Top cuts or spatial constraints were applied to Ni, Co, Mn, Fe, Mg, and Al 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 wet tonnages were estimated using wet bulk density.</li> <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 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> <li>The Mineral Resource is reported above 0.06% cobalt. This cut-off is consistent with previous Mineral Resource estimates and the 2017 Scoping Study. 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.</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</i></p>	<ul style="list-style-type: none"> <li>This Mineral Resource statement assumes mining by conventional shallow open pit techniques.</li> </ul>

JORC Code explanation	Commentary
<p>should be reported with an explanation of the basis of the mining assumptions made.</p>	
<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 with an explanation of the basis of the metallurgical assumptions made.</i></p>	<ul style="list-style-type: none"> <li>• PFS level metallurgical test work programmes have been completed. These studies have demonstrated the potential for economic Co and Ni extraction using atmospheric leaching to produce a Ni-Co mixed sulphide product.</li> </ul>
<p><b>Environmental Factors or Assumptions</b></p> <p><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></p>	<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 during 2018 and 2019. No rare flora or fauna were observed.</li> </ul>
<p><b>Sampling techniques</b></p> <p><i>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i></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> <p><i>Aspects of the determination of mineralisation that are Material to the Public Report.</i></p> <p><i>In cases where 'industry standard' work has been done this would be relatively simple (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.</i></p>	<ul style="list-style-type: none"> <li>• 1m samples were split and collected at the drill rig.</li> <li>• The remainder of the drill cuttings were immediately bagged and sealed in air-tight bags to minimise drying and agglomeration of the clays. These samples were later used for compositing and metallurgical test-work.</li> <li>• The split samples were then dried and pulverised and a 40gm sub sample analysed for Co, Ni, Mn, Zn, Mg, Al &amp; Fe using a four-acid digest with an ICP OES finish.</li> </ul>
<p><b>Drilling techniques</b></p> <p><i>Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).</i></p>	<ul style="list-style-type: none"> <li>• RC drilling was completed with a 165mm face sampling hammer.</li> <li>• AC Drilling was completed with a 102mm blade bit. The cuttings are lifted to the surface up the inner tube of the drill bit in the same manner as RC drilling.</li> <li>• All drilling was above the water table and there was no water injection used.</li> </ul>

## 21.4 Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in the preceding sections also apply to this section.)

JORC Code explanation	Commentary
<p><b>Mineral Resource estimate for conversion to Ore Reserves</b></p> <p><i>Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.</i></p> <p><i>Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.</i></p>	<ul style="list-style-type: none"> <li>Mineral resources for the Mt Thirsty deposit were estimated and reported by Golder Associates Pty Ltd. in September 2019. A cut-off grade of 0.06% Co was used for assessing the Co and Ni Mineral Resource and no cut-off grade for Ni was used for the Mineral Resources</li> <li>Mineral Resources are Inclusive of Ore Reserves</li> </ul>
<p><b>Site Visits</b></p> <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>	<ul style="list-style-type: none"> <li>The Competent Persons Visited Site as follows:</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> <li>Mr David Reid (Mineral Resources) has not visited site, however has extensive experience with similar nickel-cobalt laterite deposits in WA.</li> <li>Mr Peter Nofal (Metallurgy) has not visited site, however has extensive experience with similar nickel-cobalt laterite deposits in WA.</li> <li>Mr Frank Blanchfield (Mining) visited site in October 2019</li> </ul>
<p><b>Study status</b></p> <p><i>The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.</i></p> <p><i>The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.</i></p>	<ul style="list-style-type: none"> <li>Pre-Feasibility Study reported in February 2020.</li> </ul>
<p><b>Cut-off parameters</b></p> <p><i>The basis of the cut-off grade(s) or quality parameters applied.</i></p>	<ul style="list-style-type: none"> <li>A marginal cut-off grade was calculated for each block using values for:</li> <li>Mining Cost of \$4.96/dt rock.</li> <li>Ore loss 2%, Dilution 0% (considered to be already accounted for in resource model).</li> <li>Processing and Administration cost based on a fixed component and a variable component based on Mn grade and payable metal in product.</li> <li>Mill throughput per annum of 1.8 Mtpa</li> <li>Cobalt price of US\$61,000/t and 80% payability</li> <li>Nickel price of US\$16,500/t and 85% payability</li> <li>Exchange rate of 0.67 AUD:USD</li> <li>Vendor, State Government and Native Title Royalties of 5.32% of FOB revenue.</li> <li>Metallurgical recovery by application of regressions, averaging 74% for cobalt and 22% for Nickel over the life of mine.</li> <li>The average cut-off was approximately 0.07% Cobalt</li> </ul>
<p><b>Mining factors or assumptions</b></p> <p><i>The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to</i></p>	<ul style="list-style-type: none"> <li>Snowden Mining Industry Consultants (Snowden) completed a mining prefeasibility study for the Mt Thirsty Project in February 2020.</li> </ul>



JORC Code explanation	Commentary
<p><i>an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).</i></p> <p><i>The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.</i></p> <p><i>The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.</i></p> <p><i>The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).</i></p> <p><i>The mining dilution factors used.</i></p> <p><i>The mining recovery factors used.</i></p> <p><i>Any minimum mining widths used.</i></p> <p><i>The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.</i></p> <p><i>The infrastructure requirements of the selected mining methods</i></p>	<ul style="list-style-type: none"> <li>• An evaluation using pit optimisation to produce an economic mining shell followed by detailed pit design was used to convert the Mineral Resource to an Ore Reserve. A mine layout was planned for mining of staged designs for mine development. Mine equipment requirements were determined by contractors, who provided pricing using the Snowden mine production schedule as a basis.</li> <li>• The resource model used is named 'mtt_201906export.csv' for Mt Thirsty and generated by Golder in June 2019. Zero dilution was applied as the block models were not sub-celled and modelled to a 10 mX by 25 mY by 2 mRL block size. At this block size, the model was considered to be diluted as mining will be more selective than this. A 2% ore loss was applied.</li> <li>• For grade control, samples will be taken from blasthole cutting. For those areas that do not require drill and blast, a ditch-witch style machine will be used to rip lines across the mining floor for sampling. A fully specified XRF and ICP laboratory will be available on site.</li> <li>• The minimum Mining width subject to modified mining procedures in basal pits is 20m.</li> <li>• No in pit Inferred Resources were used to quantify Ore Reserves. Inferred Resources are however included at up to 10% in any quarter in the first 10 years of the PFS mine plan and up to 30% thereafter.</li> <li>• The deposits will be mined as open pits sequenced in mining stages and mined using semi-selective methods using conventional load and haul. Blasting will only be done in the ferro hard cap (about 13% of the rock mined) and no ore will be blasted. This will minimise ore dilution.</li> <li>• Golder Associates completed a desktop hydrogeology study in 2018. The study identified target for process water abstraction in nearby paleochannels and local fractured rock aquifers. The mine is entirely above the water table. The shallow resource holes are reported to be dry. Alluvial and colluvial deposits near the orebody may contain minor amounts of water.</li> <li>• Moisture contents within the saprolite are 26-30%, hence the in-situ material is probably close to 100% saturation. This is likely to result in piezometric pressures within the horizon that may influence pit slope stability. However, the permeability of the material is likely to be very low hence it is anticipated that flows from the material into any bore or excavation will be negligible.</li> <li>• For geotechnical and wall stability, overall slope angles (OSA) will vary with height: <ul style="list-style-type: none"> <li>• for deeper sections of saprolite (up to 70 m) the recommended maximum OSA is 30°</li> <li>• in shallower sections (less than 30 m) the recommended maximum OSA is 40°</li> <li>• in saprock the maximum inter-ramp angle (IRA) can be increased to 45°</li> </ul> </li> <li>• Saprolite will be free-dig material, but more competent saprock sections may need ripping, possibly some paddock blasting.</li> <li>• Trafficking will not be an issue on saprock benches, however haul roads and ramps on wet saprolite will need sheeting with competent sub-base material.</li> </ul>

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<p><b>Metallurgical factors or assumptions</b></p> <p><i>The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.</i></p> <p><i>Whether the metallurgical process is well-tested technology or novel in nature. • The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied. • Any assumptions or allowances made for deleterious elements.</i></p> <p><i>The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.</i></p> <p><i>For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?</i></p>	<ul style="list-style-type: none"> <li>• The metallurgical process proposed is hydrometallurgical leaching at atmospheric pressure using sulphur dioxide as the main reagent.</li> <li>• Leaching using sulphur dioxide at atmospheric pressure is applied elsewhere including at the Boleo operation in Mexico.</li> <li>• Individual unit processes are all standard well-tested technology.</li> <li>• The metallurgical test work was conducted on composites of representative samples collected by RC and AC drilling and blended into a 'Master Composite' representative of the early years of mining.</li> <li>• Variability testwork was also conducted on samples of a range of head grades. These test results were then used to construct metallurgical regressions that were also adjusted to match the performance of larger bulk leaches. Metallurgical recoveries were applied on a block-by-block basis within the mine plan.</li> </ul>
<p><b>Environmental</b></p> <p><i>The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.</i></p>	<ul style="list-style-type: none"> <li>• A reconnaissance flora and fauna survey was conducted by Spectrum Ecology at Mt Thirsty in spring 2018. The survey did not identify any rare plants or animals. Plants listed as priority flora were however identified and Malleefowl are known in the area. As such, a targeted flora and Malleefowl search was conducted over the tenements in spring 2019. No evidence of Malleefowl were found. Seven priority flora species were recorded.</li> <li>• Other environmental factors such as subterranean fauna, landforms, terrestrial environmental quality, inland waters, air quality and social surroundings are not considered to be materially impacted by the Project as assessed by Talis Environmental Consultants.</li> <li>• The likely approvals pathway for the Project will be:</li> <li>• Native Vegetation Clearing Permit, Works Approval and Environmental Licence under the Environmental Protection Act 1986</li> <li>• Licences to Construct Wells and Take Water under the Rights in Water and Irrigation Act 1914; and</li> <li>• Mining Proposal under the Mining Act 1978.</li> <li>• These approvals should be able to be completed within 6 months.</li> </ul>
<p><b>Infrastructure</b></p> <p><i>The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.</i></p>	<ul style="list-style-type: none"> <li>• Mt Thirsty is located 16km north west from the town of Norseman and 4km west of the Coolgardie-Esperance Highway, parallel to which is rail, gas, water, and fibre optic.</li> <li>• Power will be generated on site using a combined solar – diesel power station</li> <li>• Hypersaline water will be source from paleochannels to the west and east of the Project. Drilling is required to demonstrate the quality and quantity of the water source.</li> <li>• Saline water will also be sourced from local fractured rock aquifers.</li> <li>• The MTJV is enthusiastic about working the the Shire of Dundas and 3<sup>rd</sup> party mining village providers to locate accommodation for the Project within Norseman,</li> </ul>

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	<ul style="list-style-type: none"> <li>Sulphur will be imported through the Port of Esperance. While existing facilities exist, commercial negotiations have not commenced.</li> <li>The product will be containerised and can be exported from any one of many container ports within Western Australia.</li> </ul>
<p><b>Costs</b></p> <p><i>The derivation of, or assumptions made, regarding projected capital costs in the study.</i></p> <p><i>The methodology used to estimate operating costs.</i></p> <p><i>Allowances made for the content of deleterious elements.</i></p> <p><i>The source of exchange rates used in the study.</i></p> <p><i>Derivation of transportation charges.</i></p> <p><i>The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.</i></p> <p><i>The allowances made for royalties payable, both Government and private.</i></p>	<ul style="list-style-type: none"> <li>Capital Costs and Operating Costs have been estimated by Amec Foster Wheeler Pty Ltd (Wood) with reference to multiple vendor quotes.</li> <li>Mining costs were estimated based on quote received from two mining contractors.</li> <li>A market assessment of the Mt Thirsty MSP Product was completed by NC Chem Pty Ltd and the metal playabilities estimated include consideration of deleterious elements.</li> <li>Exchange rates used are the spot AUD:USD exchange rate of 0.67.</li> <li>As the MSP is a high value product, the cost of freight is not significant. An allowance has been included based on in-house data.</li> <li>Royalties of 5.32% have been allowed for including the WA State Government Royalty, a royalty due to a previous tenement owner, and a royalty for the Traditional Owners (negotiations in progress).</li> </ul>
<p><b>Revenue factors</b></p> <p><i>The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.</i></p> <p><i>The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.</i></p>	<ul style="list-style-type: none"> <li>The study is based on the following macroeconomics assumptions:</li> <li>Cobalt Price US\$61,000/t</li> <li>Nickel Price US\$17,850/t</li> <li>Cobalt Payable 80%</li> <li>Nickel Payable 85%; all as recommended by NC Chem Pty Ltd</li> <li>Forex (AUD:USD) 0.67; the February 2020 spot price.</li> </ul>
<p><b>Market assessment</b></p> <p><i>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.</i></p> <p><i>A customer and competitor analysis along with the identification of likely market windows for the product.</i></p> <p><i>Price and volume forecasts and the basis for these forecasts.</i></p> <p><i>For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</i></p>	<ul style="list-style-type: none"> <li>The Mt Thirsty Project has selected Mixed Sulphide Product (MSP) intermediate product as the preferred final product. The product contains 50:50 ratio of nickel to cobalt and is in the form of wet filter cake. Apart from the different Ni to Co ratio, this product is in a similar form to other impure nickel and cobalt intermediates already produced and refined into nickel and cobalt metals / chemicals. The average annual production rate of MSP product is forecast to contain 2,750 mtpa Ni &amp; 2,350 mtpa Co. This represents about 0.1% of current nickel market and 2% of current cobalt market.</li> <li>An assessment of multiple broker forecasts and supply and demand trends was completed by NC Chem Pty Ltd who selected a price of US\$61,000/t for cobalt and US\$17,850 for nickel.</li> <li>NC Chem Pty Ltd considered the MSP product specification and market trends and advised 80% payability for cobalt and 85% payability for nickel.</li> </ul>
<p><b>Economic</b></p> <p><i>The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.</i></p> <ul style="list-style-type: none"> <li>NPV ranges and sensitivity to variations in the significant</li> </ul>	<ul style="list-style-type: none"> <li>Financial modelling was completed by the MTJV, Snowden is reliant on the metal price projections advised by NC Chem Pty Ltd. Snowden is not expert in the forecasting of metal prices, and other than to draw attention to the sensitivity of the Project to these projections, is not able to</li> </ul>

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<p><i>assumptions and inputs</i></p>	<p>comment on the risk that these projections will change over time.</p> <ul style="list-style-type: none"> <li>The discount rate is 8% Pre Tax Real.</li> <li>The Ore Reserve only (treats Inferred Mineral Resources as waste) NPV is A\$14.0M (Pre-Tax) and A\$1.5M (Post-Tax). In this case the All In Sustaining Cost is A\$35,800/t cobalt.</li> <li>The key financial metrics and sensitivities for the Project are:               <ul style="list-style-type: none"> <li>Pre Tax NPV A\$44.4M</li> <li>Post Tax NPV A\$25.7M</li> <li>All In Sustaining Costs US\$35,400/t cobalt</li> </ul> </li> </ul> <div data-bbox="523 723 1425 1243" data-label="Figure"> <p>The chart, titled 'Mt Thirsty NPV Sensitivity', plots NPV (in millions of dollars) on the y-axis (ranging from -\$300 to \$400) against percentage change on the x-axis (ranging from 80% to 120%). Five lines represent different cost and price factors: Co Price (orange), Ni Price (grey), Forex (yellow), Capex (blue), and Opex (green). Co Price, Ni Price, and Forex show positive correlations with NPV, while Capex and Opex show negative correlations. All lines intersect at the 100% mark, where NPV is approximately \$0.</p> <table border="1"> <caption>Estimated NPV Sensitivity Data (in millions of dollars)</caption> <thead> <tr> <th>Percentage Change</th> <th>Co Price</th> <th>Ni Price</th> <th>Forex</th> <th>Capex</th> <th>Opex</th> </tr> </thead> <tbody> <tr> <td>80%</td> <td>-150</td> <td>-50</td> <td>-200</td> <td>120</td> <td>200</td> </tr> <tr> <td>90%</td> <td>-100</td> <td>-20</td> <td>-150</td> <td>100</td> <td>150</td> </tr> <tr> <td>100%</td> <td>-50</td> <td>0</td> <td>-100</td> <td>80</td> <td>100</td> </tr> <tr> <td>110%</td> <td>0</td> <td>30</td> <td>-50</td> <td>60</td> <td>50</td> </tr> <tr> <td>120%</td> <td>50</td> <td>60</td> <td>0</td> <td>40</td> <td>0</td> </tr> </tbody> </table> </div>	Percentage Change	Co Price	Ni Price	Forex	Capex	Opex	80%	-150	-50	-200	120	200	90%	-100	-20	-150	100	150	100%	-50	0	-100	80	100	110%	0	30	-50	60	50	120%	50	60	0	40	0
Percentage Change	Co Price	Ni Price	Forex	Capex	Opex																																
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<p><b>Social</b></p> <p><i>The status of agreements with key stakeholders and matters leading to social licence to operate.</i></p>	<ul style="list-style-type: none"> <li>A Native Title Agreement is presently being negotiated with the Ngadju Traditional Owners</li> <li>Consultation has been undertaken with key local stakeholders including indigenous groups, neighbouring exploration companies, government agencies including the Office of the Environmental Protection Authority and the Shire of Norseman.</li> <li>The workforce will be approximately half fly in / fly out of Perth and half residential / drive in drive out from Norseman and surrounding towns including Kalgoorlie and Esperance.</li> <li>Environmental monitoring and reporting required for the site will include the following:               <ul style="list-style-type: none"> <li>Annual Environmental Report</li> <li>Reporting under the site Groundwater Licence(s); and</li> <li>Reporting under the site Works Approval and Licence.</li> </ul> </li> </ul>																																				
<p><b>Other</b></p> <p><i>To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:</i></p> <p><i>Any identified material naturally occurring risks.</i></p> <p><i>The status of material legal agreements and marketing arrangements.</i></p>	<ul style="list-style-type: none"> <li>Risks and opportunities have been drawn from the various sections of the prefeasibility study (PFS) and collated. The risk register context was developed in consultation with stakeholders focusing on the following key focus areas:</li> <li>Health, safety and environmental (HSE) including organisational management, human resources and industrial relations</li> </ul>																																				

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<p><i>The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.</i></p>	<ul style="list-style-type: none"> <li>• External to operations including regulatory, approvals and community relations</li> <li>• Technical including process, technology, scope of work, schedule and estimates</li> <li>• Execution including engineering, procurement, construction, commissioning, ramp-up and operation</li> <li>• The final risk register comprised 81 risks identified with two very high residual risks remaining after mitigation actions were applied. Both risks are classified under the external, regulatory or approvals and community relations focus area and relate to the potential of low commodity prices on the Project economics as well as the difficulty in the current market with funding projects. There were also 18 risks with a high residual risk 43 with a medium residual risk and 18 with a low residual risk.</li> <li>• Advice from Talis Environmental Consultants Pty Ltd is that there are no impediments expected to prevent the necessary approvals under the <i>Mining Act 1978</i> and the <i>Environmental Protection Act 1986</i>.</li> <li>• A Native Title Agreement is presently being negotiated for the project. A suitable agreement in line with the PFS assumptions is expected to be reached.</li> </ul>
<p><b>Classification</b></p> <p><i>The basis for the classification of the Ore Reserves into varying confidence categories.</i></p> <p><i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i></p> <p><i>The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).</i></p>	<ul style="list-style-type: none"> <li>• Mt Thirsty Ore Reserves are estimated using the guidelines of the JORC Code 2012.</li> <li>• In pit Indicated Mineral Resources were used as the basis of Probable Ore Reserve and the Competent Person's view is that this is reasonable.</li> <li>• There are no Proved Ore Reserves.</li> </ul>
<p><b>Audits or reviews</b></p> <p><i>The results of any audits or reviews of Ore Reserve estimates.</i></p>	<ul style="list-style-type: none"> <li>• There have been no external audits of the Ore Reserve estimate</li> <li>• The mining study was reviewed internally by Snowden.</li> </ul>
<p><b>Discussion of relative accuracy/ confidence</b></p> <p><i>Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.</i></p> <p><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></p> <p><i>Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.</i></p> <p><i>It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></p>	<ul style="list-style-type: none"> <li>• The capital cost estimates in this study relating to mining, processing and cost performance are underpinned by a comprehensive PFS which has an assessed accuracy of +25% and -25% at the 90% confidence range.</li> </ul>