NORTHERN STAR
RESOURCES LIMITED

ASX ANNOUNCEMENT
3 August 2017

Australian Securities Exchange Code: NST

Board of Directors

Mr Bill Beament
Executive Chairman

Mr Chris Rowe
Non-Executive Director

Mr Peter O'Connor
Non-Executive Director

Mr John Fitzgerald
Non-Executive Director

Ms Shirley In'tVeld
Non-Executive Director

Mr David Flanagan
Non-Executive Director

Issued Capital

Shares 603 million
Options 0.9 million
Performance Rights 9.6 million

Current Share Price A$4.49

Market Capitalisation
A$2.7 billion

Cash, Bullion & Investments
30 June 2017 - A$447.2 million

Projects

Paulsens Mine
Kanowna Belle Mine
Kundana Mines (51% of EKJV)
Jundee Mine
Central Tanami (25% of JV)

Listed Investments
VXR, DAU, RND, TBR, ALY

NORTHERN STAR ESTABLISHES 10-YEAR MINE LIVES AFTER RESERVES TRIPLE TO 3.5MOZ AND RESOURCES HIT 10.2MOZ

Outstanding result underpins increase in production to 600,000ozpa from next year; Reserves added at A$24/oz

KEY POINTS

- **Northern Star's organic growth strategy has culminated in a 10.2Moz gold inventory based on Tier-1 assets in Western Australia which will underpin significant, sustainable production growth and generate industry-leading financial returns for Shareholders**
- **The substantial inventory growth stems from Northern Star's exploration success at its Jundee and Kalgoorlie Operations, both of which have been returned to their world-class status**
- **Previously-announced guidance for FY18 stands at 525,000-575,000oz at A$1,000-A$1,050/oz; Production rate on track to reach 600,000ozpa in CY2018; FY19 guidance is 550,000-600,000oz**
- **Forecast expansionary capital in FY19 A$60m and FY20 A$40m (down from A$75m in FY17 and A$65m in FY18)**
- **Expanded inventory and upgraded production capacity positions Jundee and Kalgoorlie Operations to each produce ~300,000ozpa within two years**
- **Plus, Northern Star today announces a major discovery, the Zodiac high-grade lode at Jundee; this is not included in the inventory update**
- **Initial assays from Zodiac show multiple mineralised intercepts over a 200m single downhole interval: 4.8m at 21.2gpt, 2.9m at 10.4gpt, 0.3m at 47.0gpt, 3.6m at 4.0gpt, 3.1m at 4.3gpt & 2.5m at 5.4gpt (all true width)**

FY2017 Reserve-Resource Update:

- **Total Reserves increase by 2.3Moz to 3.5Moz (despite depletion of 546,000oz in FY17)**
- **Total Resources increase by 2.7Moz to 10.2Moz, including a 58% increase in Measured and Indicated Resources to 6.3Moz, highlighting mine life visibility well past current Reserves**
- **Significant Reserve increases at the Tier-1 mines:**
  - **Jundee up 100% to 1.45Moz (despite depletion of 259koz)**
  - **Kalgoorlie Operations up 117% to 2.0Moz (despite depletion of 229koz)**
    - **Kanowna up 125% to 0.6Moz**
    - **NST 100% Kundana up 280% to 0.8Moz**
    - **EKJV 51% Kundana up 36% to 0.6Moz**
- **Significant Resource increase at the Tier-1 mines:**
  - **Jundee up 155% to 3.2Moz (now a 10Moz endowment)**
  - **Kalgoorlie Operations up 25% to 4.5Moz**
    - **NST 100% Kundana up 52% to 1.8Moz (now larger than EKJV), including a maiden Paradigm Resource of 187,000oz at 6.7gpt**
    - **51% EKJV Kundana up 35% to 1.3Moz at 6.3gpt**
- **FY18 exploration budget of A$35m to underpin Reserve replacement and potential for further growth**

Northern Star Resources Limited (ASX: NST) is pleased to announce that the Company's three-year commitment to an organic growth strategy has culminated in substantial increases in its inventory, mine life and production profile.

The outstanding result will also help underpin further growth in Northern Star's free cash flow and ensure it retains its industry-leading financial returns.

Total Reserves have increased by 2.3 million ounces to 3.5 million ounces (despite depletion of 546,000oz in FY17). The additional Reserves came at a cost of just A$24/oz. Total Resources have grown by 2.7 million ounces to 10.2 million ounces.

The increased inventory will generate significant production growth, with guidance for FY19 of 550,000-600,000oz and guidance from FY20 onwards of 575,000-625,000oz per year. This compares with previously-announced guidance for FY18 of 525,000-575,000oz.

Northern Star Executive Chairman Bill Beament said the highly successful strategy had delivered the Company world-class assets as measured by several key international benchmarks.

"Northern Star now has mine life visibility of 10 years," Mr Beament said. "Our production rate will grow to 600,000oz a year or more with scope for further significant increases as we bring our Central Tanami Project on line and revitalise Paulsens through the impending exploration program there.

"We will achieve this production growth while reducing our expansionary capital outlay to A$60 million in FY19 and A$40 million in FY20. This will help ensure our overall costs remain at or around current levels, positioning us for further substantial increases in free cash flow."

Mr Beament said the results of the exploration strategy at the Jundee and Kalgoorlie Operations demonstrated that they were world-class gold camps as measured by their total gold endowment, consistent Resource-Reserve replacement, annual production rates and free cash flow generation.

"Our Tier-1 Jundee and Kalgoorlie Operations have the capacity to each become 300,000ozpa centres over the next two years. This would see them join an exclusive club of gold mines around the globe."

The long mine life visibility is underpinned in part by the fact that the new Resource estimate contains a 58% increase in the higher-confidence Measured and Indicated category, taking that total to 6.3 million ounces.

The revised Reserve estimate includes only a small portion from several recently-defined discoveries such as Armada, Revelation, Velvet, Paradigm, Strzelecki and Raleigh South. With further work on these discoveries, Northern Star is highly confident of replacing and potentially growing Reserves again next year.

The result does not include the new Zodiac discovery at Jundee, where recent drilling has intersected multiple mineralised intersections over a 200m downhole interval.

Results from the discovery hole WSXP2165 include 4.8m at 21.2gpt, 2.9m at 10.4gpt, 0.3m at 47.0gpt, 3.6m at 4.0gpt, 3.1m at 4.3gpt and 2.5m at 5.4gpt (all true widths).

The new Zodiac discovery is located in the Stirling fault complex some 1,000m south of the Jundee underground mine. It is hosted within the Fisher Basalt and was intersected at a depth of 1,300m in the footwall of the Jundee mine sequence.

The initial Zodiac intersections span a strike length of 300m with the new mineralised corridor open in all directions beneath the Jundee mine and importantly, to the untested southern areas.

Generated from a 3D seismic survey, the Zodiac discovery has the potential to significantly expand the known parameters of the world-class Jundee gold deposit. Early indications suggest it has significant potential to extend mine life further than known Reserves and Resources.

Mineral Resource and Reserve Summary

FY17 Group Mineral Reserve Estimate is 26 million tonnes at 4.2gpt Au for 3.5 million ounces.

FY17 Group Mineral Resource Estimate is 92 million tonnes at 3.5gpt Au for 10.2 million ounces.

These figures, which are estimated to 30 June 2017, represent JORC 2012 combined Resources and Reserves for the four assets owned by Northern Star.

ORE RESERVES									
As at 30 June 2017	PROVED			PROBABLE			TOTAL RESERVES		
	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces
NST ATTRIBUTABLE	(000's)	(gpt)	(000's)	(000's)	(gpt)	(000's)	(000's)	(gpt)	(000's)
TOTAL	4,607	4.4	646	21,355	4.2	2,861	25,962	4.2	3,506

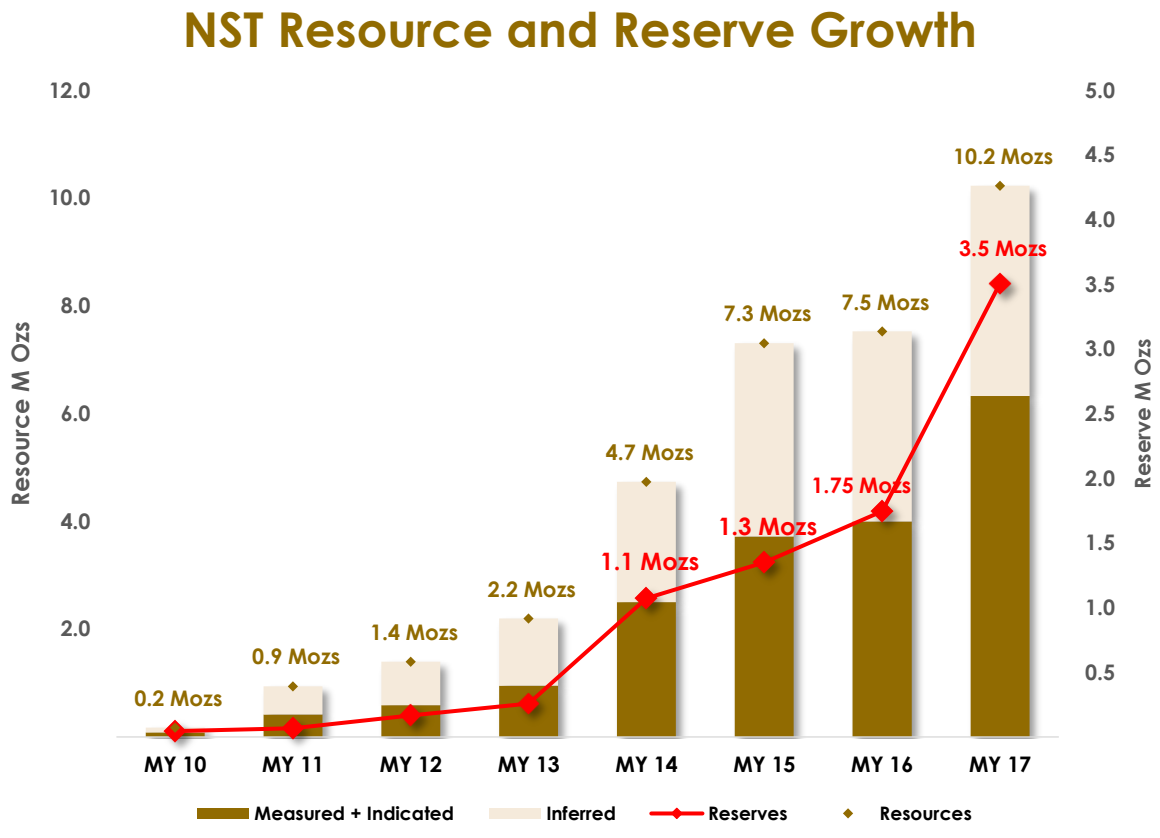
MINERAL RESOURCES												
As at 30 June 2017	MEASURED			INDICATED			INFERRED			TOTAL RESOURCES		
	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces
NST ATTRIBUTABLE	(000's)	(gpt)	(000's)	(000's)	(gpt)	(000's)	(000's)	(gpt)	(000's)	(000's)	(gpt)	(000's)
TOTAL	7,051	4.3	975	41,167	4.0	5,352	43,732	2.8	3,902	91,949	3.5	10,229

A full breakdown of each Project's Reserves and Resources can be found in Appendix A.

Over the past three years since the acquisition of Northern Star's Tier-1 portfolio, A$150 million has been spent in exploration to grow Resources, Reserves and mine lives.

During this period, Northern Star has added 4.0Moz in Reserves at a cost of A$37/oz and 7.1Moz of Resources at a cost of A$21/oz.

These significant additions show the quality of the multi-million ounce endowments that the Company operates in and their ability to continue yielding substantial quantities of gold (refer to graph below).

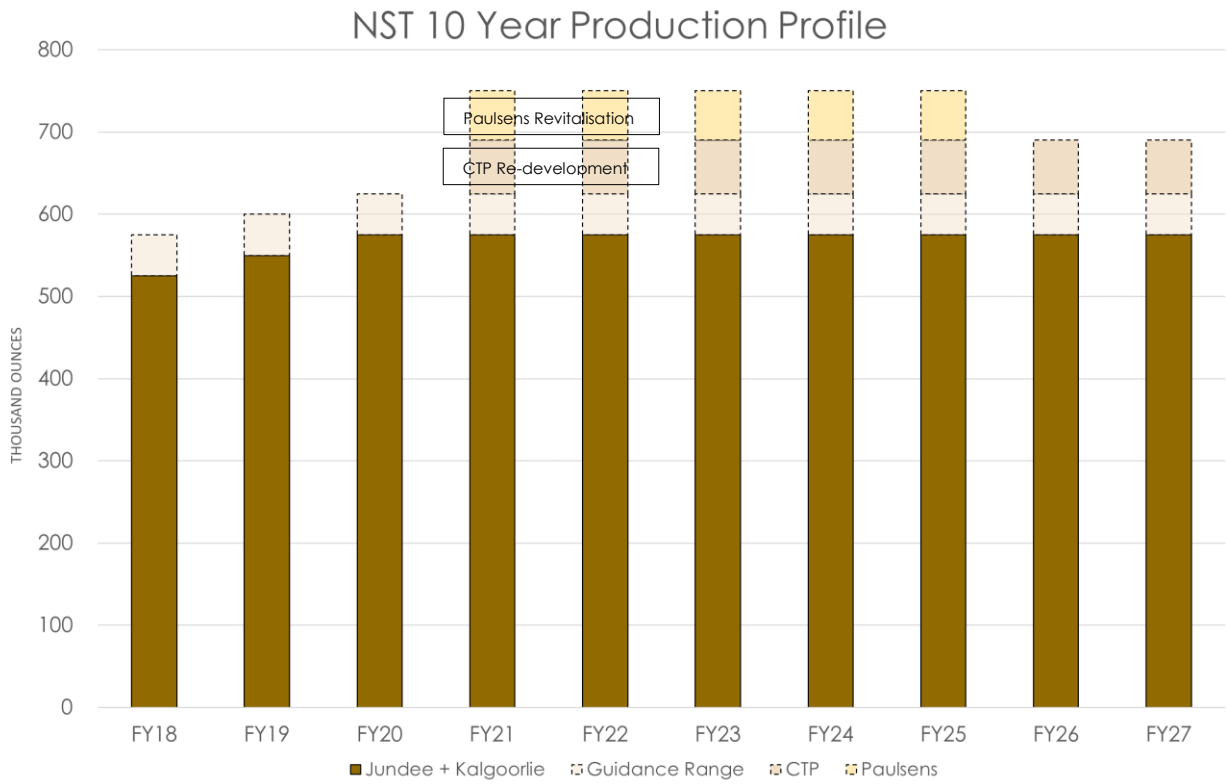


Forecasted Group Gold Production

The Jundee and Kalgoorlie Operations have the capacity to each become 300,000ozpa centres over the next two years. This achievement will enable Group production to grow to 600,000oz a year.

There is also scope for further significant increases as we bring our Central Tanami Project on line and revitalise Paulsens through the impending exploration program there.

The table below outlines future Group production forecasts for the next 10 years.



To achieve the consistent 575,000-625,000oz per annum production, forecast expansionary capital in FY18 is A$65m, A$60m in FY19 and A$40m in FY20. These figures include the cost associated with expanding the processing capacity at the Kalgoorlie Operation to cater for production growth.

Expansionary capital for the revitalisation of Paulsens and the re-development of Central Tanami has not been finalised at this stage but is expected to not be material for the Company.

Technical Asset Overview

1. Jundee Gold Operation (See Inventum 3D)

Jundee Reserves are up 100% to 1.45Moz (despite depletion of 259koz):
- Underground Reserves are 1.35Moz at 5.7gpt
- Surface/Open Pit Reserves are 0.1Moz

The Armada discovery only contributed 7% or 103,000oz to the new Reserve estimate.

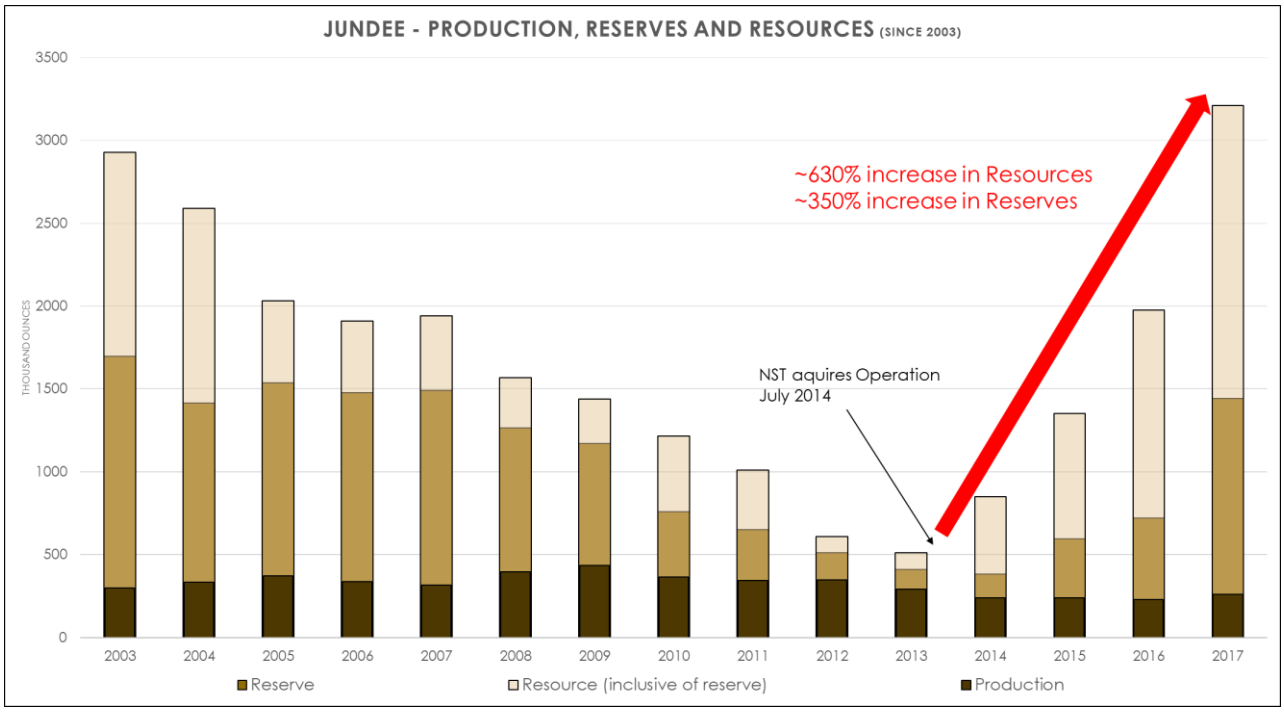
Jundee Resources are up 155% to 3.2Moz (despite depletion of 259koz):
- Underground Resources are 3.0Moz at 5.2gpt
- Surface/Open Pit Resources are 0.2Moz

The Armada discovery only contributed 9% or 288,000oz to the new Resource estimate.

With the drilling focus on defining the Armada mineralised trend, the Revelation discovery has not been expanded in new Resource estimate.

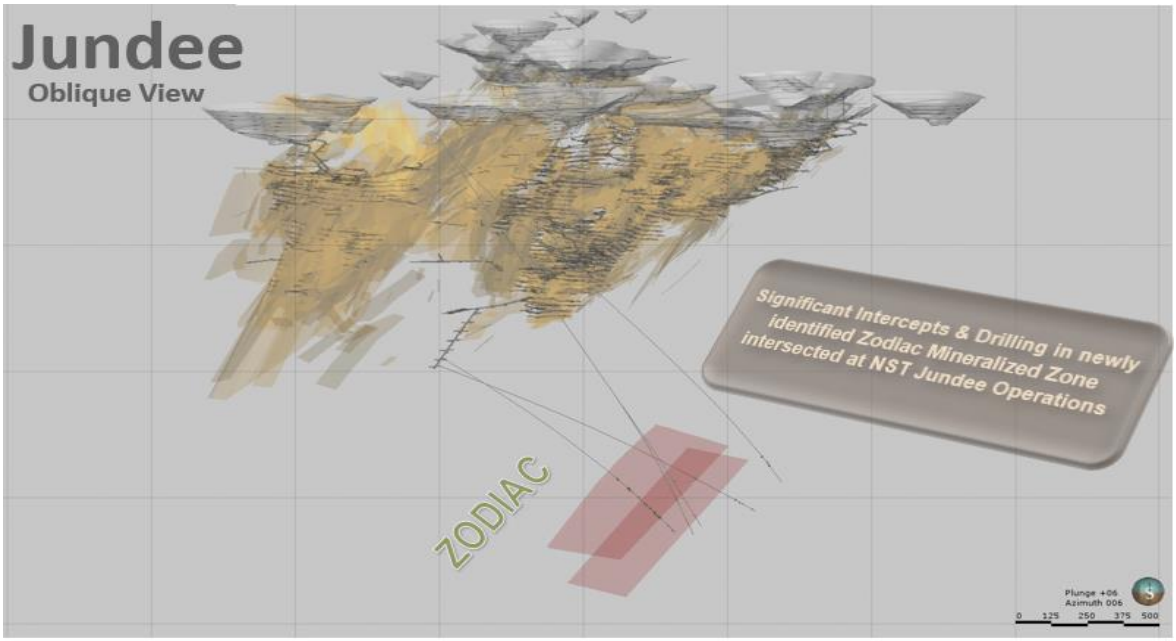
The Jundee deposit is now a 10Moz mineral endowment of which approximately 7Moz has been produced to date and the system remains open in multiple positions.

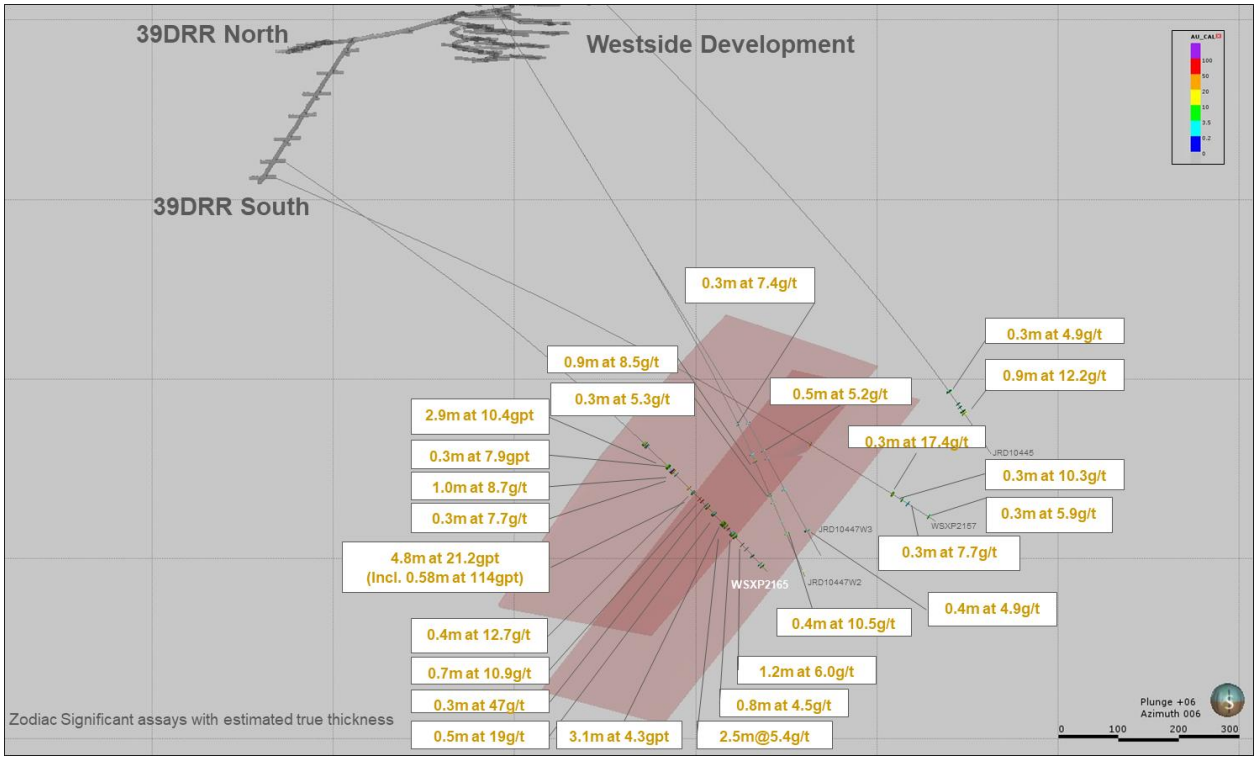
As can been seen in the chart below, Northern Star since the acquisition of Jundee three years ago has successfully concentrated on growing the Resources, Reserves and production profile. This has now restored Jundee back to its world class status that it had during the 10-year period of 2002-2011.



Indications and exploration success outside of Reserves and/or Resources at Jundee that give Northern Star a high degree of confidence in continual replacement and/or growth in mineral inventory for future years are as follows:

- continuation of the historical high Resource conversion rate at Jundee, together with the significant contribution from unmodeled material intersected consistently during drilling and mining activities;
- less than 30% of the Armada mineralised trend (incorporating Revelation) is drill tested to Inferred Resource status and remains open in all directions;
- the new Zodiac discovery is in its infancy with the potential to span a broad area equivalent to the existing Jundee deposit (refer to figures below);
- initial exploration fan drilling from the drill drive is only 65% complete with indications of depth extensions to most of the existing Jundee mining areas; and
- emergence of new surface targets from regional exploration point to further new discoveries.





2. *Kalgoorlie Gold Operations*

Kalgoorlie Reserves are up 117% to 2.0Moz (despite depletion of 229koz):

- NST 100% owned Kundana Underground Reserves are 0.8Moz at 4.2gpt
- EKJV 51% owned Kundana Underground Reserves are 0.6Moz at 5.8gpt
- Kanowna Underground Reserves are 0.5Moz at 2.9gpt
- Surface/Open Pit Reserves are 0.1Moz

Kalgoorlie Resources are up 25% to 4.5Moz (despite depletion of 229koz):

- NST 100% Kundana Underground Resources are 1.5Moz at 5.4gpt
- EKJV 51% Kundana Underground Resources are 1.24Moz at 6.7gpt
- Kanowna Underground Resources are 1.2Moz at 3.2gpt
- Surface/Open Pit Resources are 0.56Moz

(a) NST 100% owned Kundana (See Inventum 3D)

The NST 100% owned Kundana deposits are where Northern Star will achieve a large proportion of its overall Group production growth from FY18 onwards.

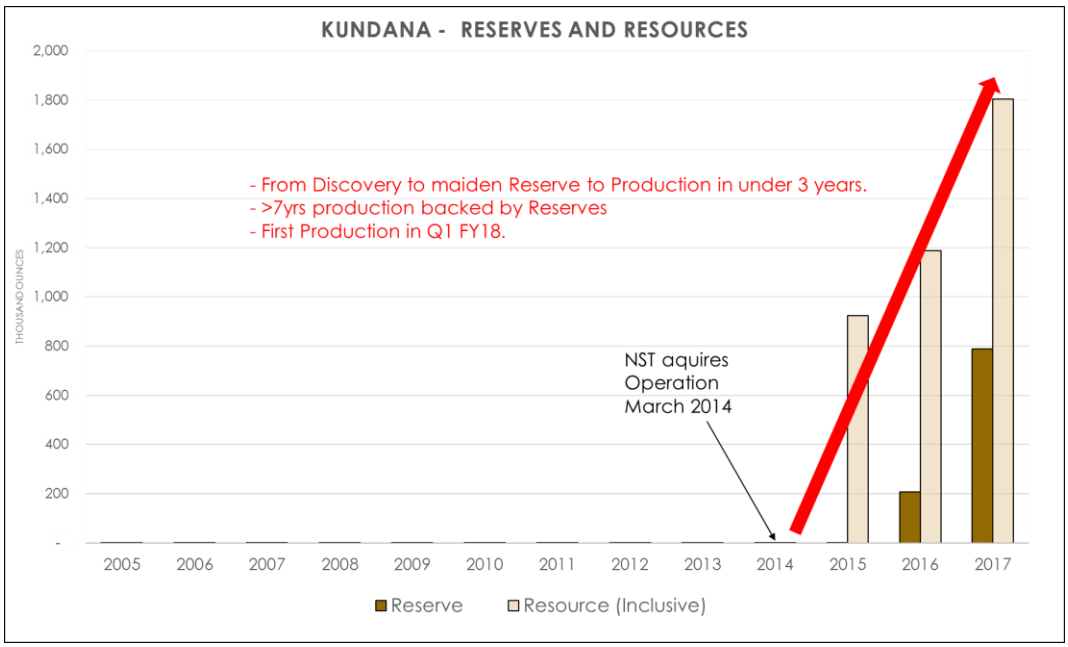
For the first time the underground Resource estimate on Northern Star's 100% Kundana tenements of 1.5Moz has exceeded the 1.24Moz underground Resource on the 51% owned EKJV at Kundana.

Included in the 1.5Moz is a maiden underground Resource at Paradigm of 187,000oz at 6.7gpt, which has the potential to grow with further drilling and interpretation.

The underground Reserve estimate of 0.8Moz has also exceeded the 0.6Moz underground Reserve for the 51% owned EKJV at Kundana.

This exploration success has enabled the new operation to go from discovery, to maiden Reserve, to production in under three years.

As can been seen in the chart below, since the acquisition of the 100% Kundana tenements three years ago, Northern Star has successfully concentrated on establishing Resources, Reserves and building a significant and long life production profile.

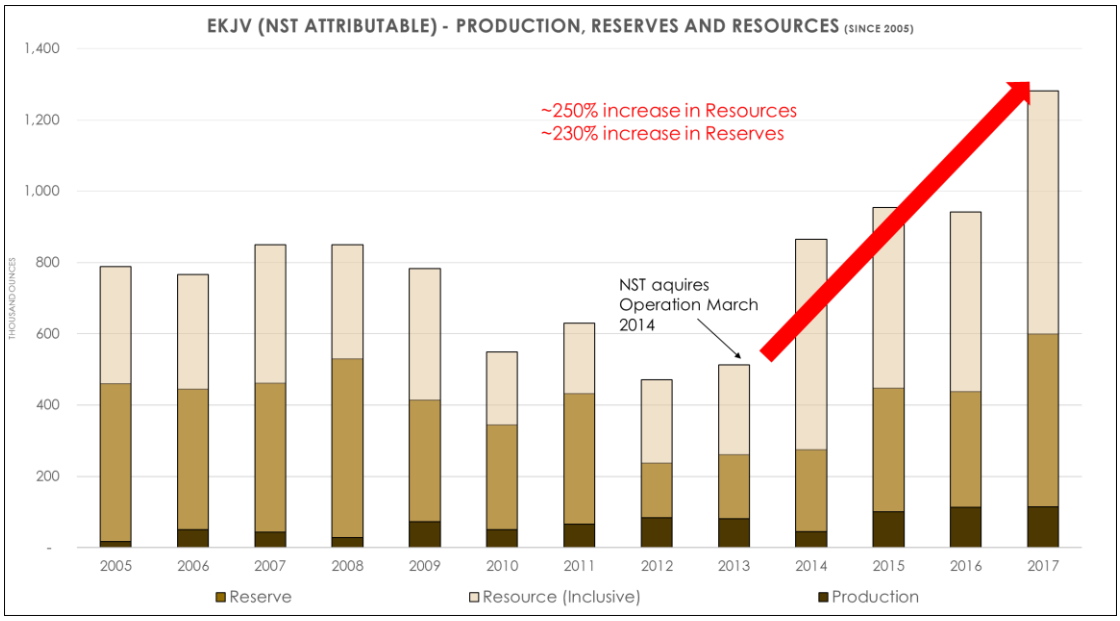


The reasons why Northern Star has a high degree of confidence in continual replacement and/or further growth in mineral inventory for future years at its 100% owned Kundana tenements are:

- high historical conversion rate (+80%) of identified Resources within the K2 and Strzelecki-Raleigh systems;
- new extensions to the Strzelecki system remain open along strike with the strong development of a second parallel surface;
- expansion of the Millennium trend at depth and northwards to the North Pit/Arctic region;
- expansion of the Pope John trend at depth;
- further resource expansion at both Carbine and Paradigm together with emerging new prospects at Zorro, Drago and Emerenco; and
- growth potential from new tenure in the Carnage area.

(b) EKJV 51% Kundana (See Inventum 3D)

As can been seen in the chart below, since the acquisition of the EKJV 51% owned Kundana tenements three years ago, Northern Star has successfully concentrated on growing the Resources, Reserves and production profile. This has now delivered the largest Reserve base and highest annual production rate since the operation commenced in1988.



The reasons why Northern Star has a high degree of confidence in continual replacement and/or further growth in mineral inventory at its 51% owned EKJV are:

- high historical conversion rate (+80%) of identified resources within the K2 and Strzelecki-Raleigh systems;
- extensions to the Raleigh system to the south with approximately 2.5km of strike relatively untested;
- expansion of the Rubicon/Hornet/Pegasus systems at depth and in multiple structures identified in close proximity to the hanging wall of the K2 structure;
- new positions along the K2 corridor between Pegasus and Moonbeam including Drake and Lunar Duck prospects; and
- continued exploration of the Falcon discovery between Pegasus and Raleigh lodes.

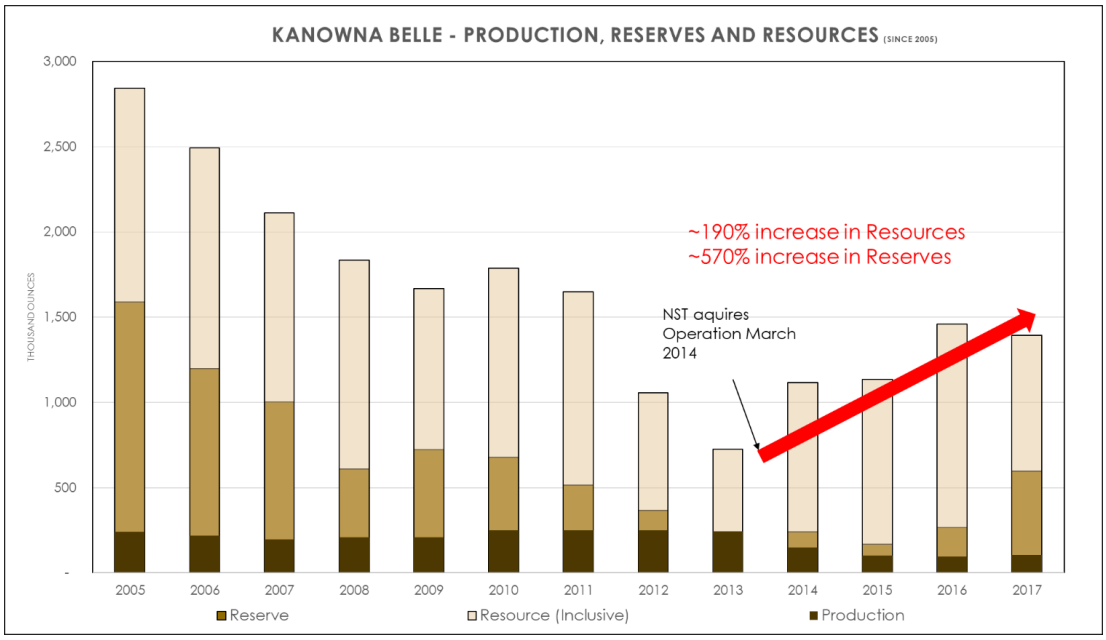
(c) Kanowna Gold Mine (See Inventum 3D)

The Kanowna underground Reserve has grown 120% to 0.5Moz due to both the exploration success and by the substantial operational cost reductions which has enabled a larger proportion of the Resource to convert to Reserve.

The Velvet discovery only contributed 21% or 105,000oz to the new Reserve estimate and 10% or 143,000oz to the new Resource estimate. Further exploratory drilling at the Lower Velvet intersected a significant new mineralisation trend down dip along the Fitzroy Fault.

As can been seen in the chart below, Northern Star since the acquisition of Kanowna three years ago has successfully concentrated on growing the Resources, Reserves and maintaining the production profile. This has now delivered the largest reserve base in the past 7 years for the project and secured its long-term future.

The visibility of mine life will now enable Northern Star to invest in drilling at depth of the +5Moz system where there are already encouraging signs that the 4,000oz per vertical metre orebody continues.



Indications and exploration success outside of Reserves and/or Resources at Kanowna that give Northern Star a high degree of confidence in continual replacement and/or growth in mineral inventory for future years are as follows:

- continued expansion at Velvet as shown by the recent Lower Velvet discovery;
- extensions to E Block in both directions;
- ongoing evaluation of Lowes Deeps for a further 600m below existing operations; and
- emerging new regional exploration targets at Woodline, Shamrock and Red Eye.

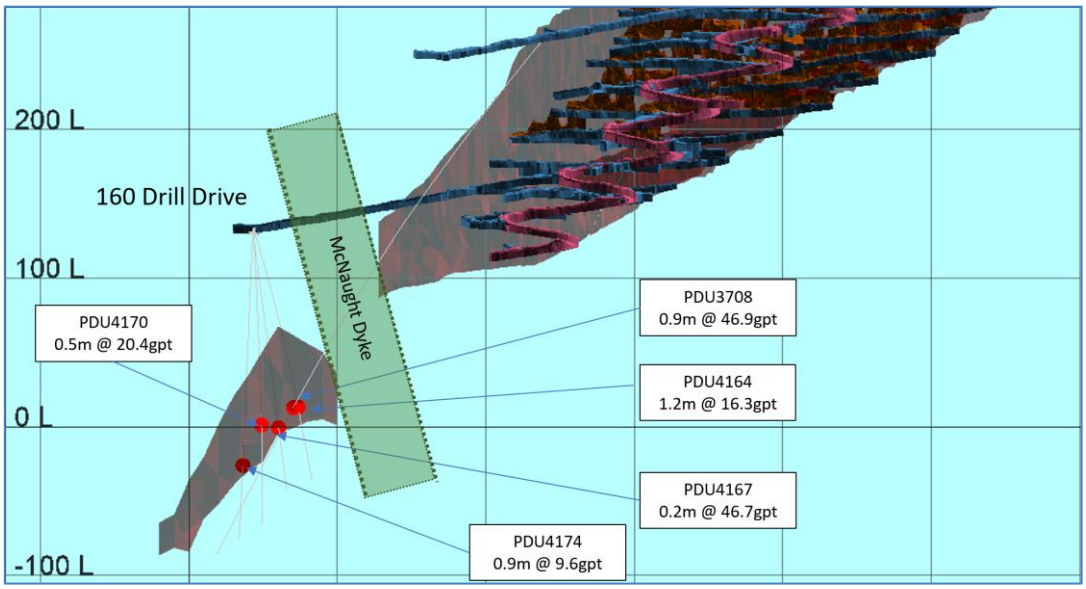
3. *Paulsens Gold Mine* (See Inventum 3D)

Northern Star has committed to invest approximately A$10 million in exploration at Paulsens over the next two years to revitalise the operation and potentially deliver further production from FY21.

In a similar way to the success achieved at its other assets, the initial exploration program aims to rebuild the Paulsens Resource inventory through both underground and surface drilling programs in and around the deposit.

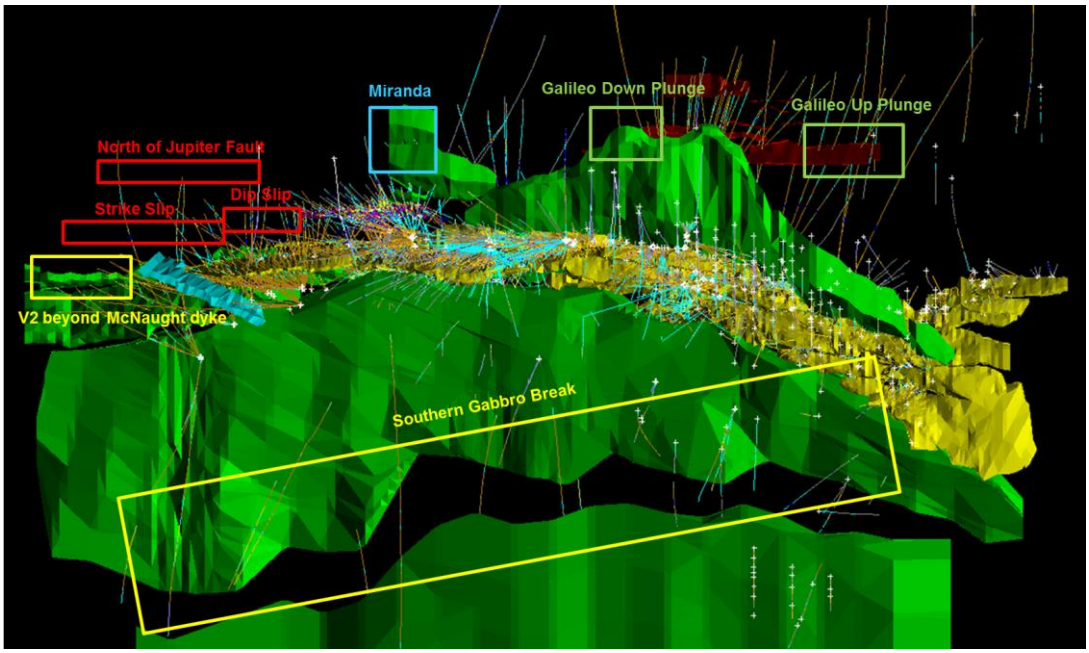
The Company has a two-pronged strategy to return Paulsens to its historical production average of 75,000oz per year.

First, continue drilling down-plunge of the Voyager 2 orebody beyond the current dyke from the recently established 160mRL drill drive. This has shown some early promising results and indicates that the ore system is still well mineralised beyond the dyke (see figure below).



Second, surface and underground drilling will shortly commence on the Southern Gabbro break target located 600m south of the Paulsens mining area.

Early drilling has intersected a new, parallel, quartz-filled structure in the Mine gabbro sequence exhibiting many features of the main lode at Paulsens where ~1moz at +7gpt has been mined to date. (see figure below).



4. Central Tanami Project "CTP"

The Company has established a significant footprint within the Tanami region of the Northern Territory through the Tanami Regional Project (100%) and the Central Tanami Joint Venture (25% ownership moving to 60% with project expenditure).

The Tanami region is considered to be an under-explored frontier in Australia for gold and the Company has access to over 9,200km^2 of granted and pending tenure within the region.

In FY18, an initial A$6 million exploration budget has been set as part of a longer-term strategy to advance the evaluation of existing deposits within the CTP tenure and commence the large-scale evaluation of the Company's position within this terrain for significant new gold discoveries.

Large-scale regional airborne and ground geophysical surveys are nearing completion over broad areas of the Tanami and Central Tanami tenements.

Evaluation programs continue to advance within the CTP mine corridor and Suplejack project areas in conjunction with the commencement of a regional ground geophysical survey.

Project economical evaluation will recommence on the CTP towards the end of 2017. Subject to a positive outcome, the CTP has the potential to be a 75,000oz a year operation (NST share).

Yours faithfully

BILL BEAMENT
Executive Chairman
Northern Star Resources Limited

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Competent Persons Statements

The information in this announcement that relates to exploration results, data quality, geological interpretations and Mineral Resource estimations for the Company's Project areas is based on information compiled by Darren Cooke, a Competent Person who is a Member of the Australian Institute of Geoscientists and a full-time employee of Northern Star Resources Limited. Mr Cooke has sufficient experience that is relevant to the styles of mineralisation and type of deposits under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" for the Company's Project areas. Mr Cooke consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

The information in this announcement that relates to Ore Reserve estimations for the Company's Project areas is based on information compiled by Jeff Brown and fairly represents this information. Mr. Brown is a Member of the Australian Institute of Mining and Metallurgy who is a full-time employee of Northern Star Resources Limited and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr. Brown consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

The information in this announcement that relates to the Central Tanami Gold Project is extracted from the Tanami Gold NL ASX announcement entitled "Quarterly Report for the Period Ending 31 March 2014" released on 1 May 2014 and is available to view on www.tanami.com.au.

The information in this announcement that relates to mineral resource estimations, data quality, geological interpretations and potential for eventual economic extraction for the Groundrush deposit at the is Central Tanami Gold Project based on information compiled by Darren Cooke a Competent Person who is a Member of the Australian Institute of Geoscientists and a full-time employee of Northern Star Resources Limited. Mr. Cooke has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" for the Group reporting. Mr. Cooke consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

The Company confirms that it is not aware of any further new information or data that materially affects the information included in the original market announcement entitled "Quarterly Report for the Period Ending 31 March 2014" released on 1 May 2014 and, in the case of estimates of Mineral Resources or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. To the extent disclosed above, the Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

Forward Looking Statements

Northern Star Resources Limited has prepared this announcement based on information available to it. No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions and conclusions contained in this announcement. To the maximum extent permitted by law, none of Northern Star Resources Limited, its directors, employees or agents, advisers, nor any other person accepts any liability, including, without limitation, any liability arising from fault or negligence on the part of any of them or any other person, for any loss arising from the use of this announcement or its contents or otherwise arising in connection with it.

This announcement is not an offer, invitation, solicitation or other recommendation with respect to the subscription for, purchase or sale of any security, and neither this announcement nor anything in it shall form the basis of any contract or commitment whatsoever. This announcement may contain forward looking statements that are subject to risk factors associated with gold exploration, mining and production businesses. It is believed that the expectations reflected in these statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to price fluctuations, actual demand, currency fluctuations, drilling and production results, Reserve estimations, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory changes, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

APPENDIX A – RESOURCES & RESERVES

MINERAL RESOURCES STATEMENT FOR YEAR ENDED 30 JUNE 2017

MINERAL RESOURCES
As at 30 June 2017

NST ATTRIBUTABLE INCLUSIVE OF RESERVE	MEASURED			INDICATED			INFERRED			TOTAL RESOURCES		
	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)
JUNDEE GOLD PROJECT												
Surface	-	-	-	2,918	1.5	138	1,346	1.4	59	4,264	1.4	197
Underground	874	8.0	224	10,467	5.4	1,817	6,525	4.4	915	17,866	5.1	2,956
Stockpiles	1,021	1.3	44	-	-	-	-	-	-	1,021	1.3	44
Gold in Circuit	-	-	10	-	-	-	-	-	-	-	-	10
Sub-Total Jundee	1,895	4.6	278	13,385	4.5	1,955	7,871	3.8	974	23,151	4.3	3,207
KANOWNA GOLD PROJECT												
Surface	-	-	-	1,504	2.2	105	3,246	1.0	108	4,750	1.4	213
Underground	1,460	3.4	159	7,061	3.2	730	2,685	3.1	265	11,206	3.2	1,154
Stockpiles	332	1.5	16	-	-	-	-	-	-	332	1.5	16
Gold in Circuit	-	-	9	-	-	-	-	-	-	-	-	9
Sub-Total Kanowna	1,792	3.2	184	8,565	3.0	835	5,931	2.0	373	16,288	2.7	1,392
KUNDANA GOLD PROJECT												
Surface	-	-	-	-	-	-	-	-	-	-	-	-
Underground	154	5.5	27	5,066	5.2	852	2,405	5.4	420	7,625	5.3	1,299
Stockpiles	43	1.3	2	-	-	-	-	-	-	43	1.4	2
Sub-Total Kundana Gold	197	4.6	29	5,066	5.2	852	2,405	5.4	420	7,668	5.3	1,301
CARBINE PROJECT												
Surface	-	-	-	-	-	-	7,044	1.4	312	7,044	1.4	312
Underground	-	-	-	297	8.1	77	576	5.9	110	873	6.7	187
Sub-Total Carbine	-	-	-	297	8.1	77	7,620	1.7	422	7,917	2.0	499
EAST KUNDANA JOINT VENTURE												
Surface	-	-	-	148	4.8	23	201	1.6	10	349	3.0	33
Underground	807	9.7	252	3,544	6.8	772	1,426	4.6	212	5,776	6.7	1,236
Stockpiles	81	3.8	10	-	-	-	-	-	-	81	3.7	10
Gold in Circuit	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total East Kundana JV	887	9.2	262	3,692	6.7	795	1,627	4.2	222	6,206	6.4	1,279
PAULSENS PROJECT												
Surface	-	-	-	129	3.1	13	860	2.0	54	989	2.1	67
Underground	302	7	65	160	5.4	28	165	6.0	32	627	6.2	124
Stockpiles	64	2	5	-	-	-	-	-	-	64	2.3	5
Gold in Circuit	-	-	0	-	-	1	-	-	-	-	-	1
Sub-Total Paulsens	366	5.9	70	289	4.5	42	1,025	2.6	86	1,679	3.7	198
ASHBURTON PROJECT												
Surface	-	-	-	7,104	2.4	546	14,227	2.5	1,122	21,331	2.4	1,668
Stockpiles	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total Ashburton	-	-	-	7,104	2.4	546	14,227	2.5	1,122	21,331	2.4	1,668
CENTRAL TANAMI PROJECT JV												
Underground	1,564	2.9	145	2,769	2.8	250	3,026	2.9	283	7,359	2.9	678
Stockpiles	350	0.7	8	-	-	-	-	-	-	350	0.7	8
Sub-Total Central Tanami JV	1,914	2.5	153	2,769	2.8	250	3,026	2.9	283	7,709	2.8	686
NORTHERN STAR TOTAL	**7,051**	**4.3**	**975**	**41,167**	**4.0**	**5,352**	**43,732**	**2.8**	**3,902**	**91,949**	**3.5**	**10,229**

Note:

1. Mineral Resources are inclusive of Ore Reserves.
2. Mineral Resources are reported at various gold price guidelines (a. A$1,750/oz Au - Jundee, Kanowna, Kundana Gold, Carbine, East Kundana JV, Jundee, Paulsens, b. A$1,850 /oz Au - Ashburton).
2. Rounding may result in apparent summation differences between tonnes, grade and contained metal content.
3. Numbers are 100% NST attributable.

Competent Person:

1. Darren Cooke.

ORE RESERVES STATEMENT FOR YEAR ENDED 30 JUNE 2017

ORE RESERVES

As at 30 June 2017

NST ATTRIBUTABLE INCLUSIVE OF RESERVE	PROVED			PROBABLE			TOTAL RESERVE		
	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)
JUNDEE GOLD PROJECT									
Surface	-	-	-	971	1.4	43	971	1.4	43
Underground	889	6.7	192	6,488	5.5	1,151	7,377	5.7	1,343
Stockpiles	1,021	1.3	44	-	-	-	1,021	1.3	44
Gold in Circuit	-	-	10	-	-	-	-	-	10
Sub-Total Jundee	1,909	4.0	246	7,459	5.0	1,194	9,369	4.8	1,440
KANOWNA GOLD PROJECT									
Surface	-	-	-	1,002	2.1	69	1,002	2.1	69
Underground	1,069	3.3	114	4,392	2.7	387	5,461	2.9	502
Stockpiles	332	1.5	16	-	-	-	332	1.5	16
Gold in Circuit	-	-	9	-	-	-	-	-	9
Sub-Total Kanowna	1,401	3.1	140	5,394	2.6	457	6,795	2.7	596
KUNDANA GOLD PROJECT									
Surface	-	-	-	-	-	-	-	-	-
Underground	12	5.2	2	5,642	4.0	735	5,654	4.1	737
Stockpiles	43	1.3	2	-	-	-	43	1.3	2
Sub-Total Kundana Gold	55	2.2	4	5,642	4.0	735	5,697	4.0	738
CARBINE PROJECT									
Surface	-	-	-	-	-	-	-	-	-
Underground	-	-	-	183	7.6	45	183	7.6	45
Stockpiles	-	-	-	-	-	-	-	-	-
Sub-Total Carbine	-	-	-	183	7.6	45	183	7.6	45
EAST KUNDANA JOINT VENTURE									
Surface	-	-	-	68	5.8	13	68	5.8	13
Underground	761	8.0	196	2,358	5.1	385	3,119	5.8	581
Stockpiles	80	3.8	10	-	-	-	80	3.8	10
Gold in Circuit	-	-	-	-	-	-	-	-	-
Sub-Total East Kundana JV	841	7.6	206	2,426	5.1	398	3,267	5.7	603
PAULSENS PROJECT									
Surface	-	-	-	-	-	-	-	-	-
Underground	89	5.4	16	91	4.2	12	180	4.8	28
Stockpiles	64	2.4	5	-	-	-	64	2.4	5
Gold in Circuit	-	-	1	-	-	-	-	-	1
Sub-Total Paulsens	153	4.3	21	91	4.2	12	243	4.3	34
ASHBURTON PROJECT									
Surface	248	3.6	29	160	4.1	21	408	3.8	50
Stockpiles	-	-	-	-	-	-	-	-	-
Sub-Total Ashburton	248	3.6	29	160	4.1	21	408	3.8	50
NORTHERN STAR TOTAL	**4,607**	**4.4**	**646**	**21,355**	**4.2**	**2,861**	**25,962**	**4.2**	**3,506**

Note:

1. Ore Reserves are reported at the gold price of A$1,500/oz Au, except Ashburton which is reported at A$1,600/oz.
2. Rounding may result in apparent summation differences between tonnes, grade and contained metal content.
3. Ounces are estimates of metal contained in the Ore Reserve and do not include allowances for processing losses.
4. Numbers are 100% NST attributable.

Competent Persons:

1. Jeff Brown (All Reserves except Ashburton).
1. Shane McLeay (Ashburton only).

APPENDIX B – DRILL RESULTS

JUNDEE SIGNIFICANT INTERSECTIONS - ARMADA

Drill Hole ID	Easting (Mine Grid)	Northing (Mine Grid)	Drill hole collar RL (Mine Grid)	Dip (degrees)	Azimuth (degrees, Mine Grid)	End of hole depth (m)	Downhole From (m)	Downhole To (m)	Downhole Intersection (m)	Au (gpt) uncut	Est True Thickness (m)
WSXP2001	49489	97221	1658	20	270	649.9			NSI		
WSXP2017_W2	49588	96541	1912	5	266	363.3			NSI		
WSXP2017W1	49588	96540	1912	5	266	460.0	417.0	418.9	1.9	1.1	1.5
WSXP2017W1	49588	96540	1912	5	266	460.0	421.4	424.3	2.9	3.0	2.2
WSXP2021	49489	96761	1722	20	270	605.4	544.7	545.1	0.4	2.7	0.3
WSXP2021	49489	96761	1722	20	270	605.4	548.5	549.0	0.5	2.1	0.3
WSXP2022	49489	96761	1722	2	270	432.4			NSI		
WSXP2044	49466	97113	2029	-11	244	600.0	355.3	355.6	0.4	20.5	0.3
WSXP2047	49457	97126	2028	-4	276	550.0	349.5	350.2	0.7	3.9	0.5
WSXP2048	49457	97126	2029	-12	276	575.0	351.3	352.6	1.3	22.5	0.8
WSXP2048	49457	97126	2029	-12	276	575.0	424.6	426.8	2.2	18.5	2.0
WSXP2048	49457	97126	2029	-12	276	575.0	427.5	427.8	0.3	4.1	0.3
WSXP2050	49456	97126	2029	-7	287	606.0	432.8	433.2	0.4	0.5	0.3
WSXP2051	49456	97126	2029	-14	284	650.0	578.3	578.6	0.3	5.4	0.3
WSXP2052	49491	97057	1681	8	268	710.1	493.7	494.1	0.5	8.3	0.4
WSXP2053	49491	97057	1681	7	259	1021.0	320.0	320.4	0.4	25.2	0.3
WSXP2054	49603	97256	2019	11	288	750.0	263.7	264.1	0.3	35.5	0.3
WSXP2054	49603	97256	2019	11	288	750.0	559.4	562.8	3.4	4.5	2.5
WSXP2055	49602	97255	2019	-1	287	779.7			NSI		
WSXP2056	49603	97254	2019	-11	278	840.3			NSI		
WSXP2057	49603	97256	2019	8	300	780.0			NSI		
WSXP2058	49603	97254	2020	14	298	750.0	270.4	270.9	0.5	72.8	0.4
WSXP2059	49489	96912	1703	19	268	605.9			NSI		
WSXP2060	49489	96911	1703	10	267	700.4			NSI		
WSXP2062	49489	96912	1702	18	259	690.0	475.0	475.7	0.7	3.5	0.4
WSXP2062	49489	96912	1702	18	259	690.0	506.3	507.1	0.8	2.1	0.7
WSXP2063	49386	96079	1678	20	270	600.0			NSI		
WSXP2069C	49457	97126	2028	-9	276	470.0	301.8	302.6	0.8	0.3	0.7
WSXP2069C	49457	97126	2028	-9	276	470.0	336.0	337.0	1.0	2.0	0.3
WSXP2070	49457	97126	2028	-5	269	460.0	282.9	283.2	0.3	0.1	0.3
WSXP2071	49457	97126	2028	-12	256	470.0	340.2	340.6	0.4	5.0	0.4
WSXP2071	49457	97126	2028	-12	256	470.0	341.4	341.7	0.3	2.2	0.3
WSXP2072	49457	97126	2028	-18	273	550.1	351.4	352.4	1.0	1.2	0.8
WSXP2072	49457	97126	2028	-18	273	550.1	386.8	387.3	0.5	2.4	0.4
WSXP2072	49457	97126	2028	-18	273	550.1	456.0	456.5	0.5	1.1	0.4
WSXP2073	49457	97126	2028	-19	262	554.7	63.3	64.4	1.2	3.6	1.0
WSXP2073	49457	97126	2028	-19	262	554.7	390.2	390.5	0.3	5.2	0.3
WSXP2073	49457	97126	2028	-19	262	554.7	466.7	467.2	0.4	1.0	0.3
WSXP2074	49457	97125	2029	-19	251	574.9	382.8	383.6	0.8	8.4	0.6
WSXP2074	49457	97125	2029	-19	251	574.9	384.0	384.6	0.6	25.1	0.5
WSXP2074	49457	97125	2029	-19	251	574.9	384.6	386.0	1.4	3.6	0.3
WSXP2075	49457	97125	2029	-16	246	580.0	372.7	373.9	1.3	8.8	1.0
WSXP2093	49489	96761	1722	8	257	690.0	501.9	503.0	1.1	4.3	0.8
WSXP2093	49489	96761	1722	8	257	690.0	504.4	505.9	1.5	2.5	1.4
WSXP2093	49489	96761	1722	8	257	690.0	507.8	508.5	0.6	6.3	0.6
WSXP2094	49489	96761	1722	7	266	690.1	513.6	514.7	1.1	5.7	0.9
WSXP2094	49489	96761	1722	7	266	690.1	519.8	521.5	1.7	17.2	0.6
WSXP2095	49489	96761	1722	6	273	690.0	500.4	501.2	0.8	5.3	0.3
WSXP2096	49489	96760	1723	1	260	800.2	540.1	540.4	0.3	3.1	0.3
WSXP2096	49489	96760	1723	1	260	800.2	541.9	542.3	0.4	1.2	0.3
WSXP2097	49488	96761	1722	0	268	750.1	526.8	527.1	0.3	1.1	0.3
WSXP2097	49488	96761	1722	0	268	750.1	531.0	532.3	1.3	3.0	0.3
WSXP2113	49491	97057	1681	13	258	650.0	493.2	493.5	0.4	19.9	0.3
WSXP2114	49491	97057	1681	14	274	648.9	473.0	473.5	0.4	7.5	0.3
WSXP2120	49588	96541	1912	13	263	465.5	262.0	262.3	0.3	24.3	0.3
WSXP2120	49588	96541	1912	13	263	465.5	390.6	391.3	0.7	5.8	0.6
WSXP2120	49588	96541	1912	13	263	465.5	394.0	395.0	1.1	4.3	0.8
WSXP2121	49588	96541	1912	14	275	480.0	395.7	396.2	0.5	1.4	0.3
WSXP2122	49588	96541	1912	20	286	479.3	405.5	405.8	0.3	2.8	0.3
WSXP2123	49588	96541	1912	1	276	568.2	474.0	476.0	2.0	11.0	1.0
WSXP2123	49588	96541	1912	1	276	568.2	477.8	480.5	2.7	40.6	1.2
WSXP2123						*Including*	479.6	479.9	0.4	271.0	0.3
WSXP2123	49588	96541	1912	1	276	568.2	481.2	481.7	0.5	590.0	0.4
WSXP2123	49588	96541	1912	1	276	568.2	510.5	512.4	1.8	5.3	0.8
WSXP2123	49588	96541	1912	1	276	568.2	515.6	516.3	0.6	4.5	0.4
WSXP2123_W1	49588	96541	1912	1	276	569.7	462.8	463.8	0.9	7.0	0.8
WSXP2123_W1	49588	96541	1912	1	276	569.7	471.4	472.1	0.7	27.1	0.6
WSXP2123_W1	49588	96541	1912	1	276	569.7	472.8	473.9	1.1	18.6	0.8
WSXP2123_W1	49588	96541	1912	1	276	569.7	478.6	478.9	0.3	7.6	0.3
WSXP2124	49465	97118	2030	2	236	482.4			NSI		
WSXP2125	49465	97118	2030	-1	249	440.0			NSI		
WSXP2126	49466	97114	2029	-6	235	540.0	401.1	401.8	0.7	7.8	0.5
WSXP2126	49466	97114	2029	-6	235	540.0	407.0	407.3	0.3	2.5	0.3
WSXP2126	49466	97114	2029	-6	235	540.0	413.3	414.6	1.3	10.6	1.0
WSXP2127	49466	97114	2029	-12	237	559.4	423.6	423.9	0.3	9.8	0.3
WSXP2128	49466	97114	2029	-17	242	580.0			NSI		
WSXP2129	49602	97255	2020	1	272	580.0	523.9	524.3	0.4	25.6	0.3
WSXP2129	49602	97255	2020	1	272	580.0	528.4	528.7	0.3	5.6	0.3
WSXP2130	49602	97255	2020	8	273	579.4	500.7	501.4	0.8	3.0	0.7
WSXP2131	49603	97254	2020	5	280	630.5	284.7	285.0	0.3	145.0	0.3
WSXP2132	49602	97254	2020	13	282	534.7	471.3	472.9	1.6	4.3	1.2
WSXP2133	49489	96761	1723	13	263	585.2	472.4	473.8	1.4	4.5	1.2
WSXP2133	49489	96761	1723	13	263	585.2	479.0	480.6	1.6	10.8	1.5
WSXP2133	49489	96761	1723	13	263	585.2	484.5	485.5	0.9	4.9	0.8
WSXP2133	49489	96761	1723	13	263	585.2	486.0	488.4	2.4	3.0	2.2
WSXP2133	49489	96761	1723	13	263	585.2	489.2	489.9	0.7	3.0	0.5
WSXP2133	49489	96761	1723	13	263	585.2	491.7	493.4	1.7	8.7	1.5
WSXP2134	49489	96761	1723	16	273	585.0	52.4	55.3	2.9	2.4	2.6
WSXP2134	49489	96761	1723	16	273	585.0	491.0	491.4	0.5	4.1	0.4
WSXP2134	49489	96761	1723	16	273	585.0	500.1	500.4	0.3	7.8	0.3
WSXP2134	49489	96761	1723	16	273	585.0	505.8	506.8	0.9	6.0	0.7
WSXP2140	49466	97114	2029	-16	240	569.9			NSI		
WSXP2141	49489	96624	1741	14	275	595.0			NSI		
WSXP2142	49489	96623	1741	12	272	605.0	474.1	474.9	0.8	6.6	0.7
WSXP2142	49489	96623	1741	12	272	605.0	477.6	479.1	1.5	11.7	1.3
WSXP2142	49489	96623	1741	12	272	605.0	480.1	483.5	3.4	8.4	3.1
WSXP2143	49489	96623	1741	12	268	524.5	477.6	493.3	15.7	10.6	14.0
WSXP2144	49489	96623	1742	17	268	510.1			NSI		
WSXP2145	49489	96623	1742	17	264	536.0	451.0	454.0	3.0	3.8	2.1
WSXP2146	49489	96623	1742	16	260	494.9			NSI		

JUNDEE SIGNIFICANT INTERSECTIONS - ZODIAC

Drill Hole #	Easting (Mine Grid)	Northing (Mine Grid)	Drill hole collar RL (Mine Grid)	Dip (degrees)	Azimuth (degrees, Mine Grid)	End of hole depth (m)	Downhole From (m)	Downhole To (m)	Downhole Intersection (m)	Au (gpt) uncut	Est True Thickness (m)
JRD10445	49265	95395	2571	-47	70	1893.7	1767.1	1767.5	0.5	4.9	0.3
JRD10445	49265	95395	2571	-47	70	1893.7	1807.0	1807.5	0.5	3.7	0.4
JRD10445	49265	95395	2571	-47	70	1893.7	1808.2	1808.5	0.3	4.2	0.3
JRD10445	49265	95395	2571	-47	70	1893.7	1811.7	1812.8	1.1	12.2	0.9
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1529.0	1531.0	2.0	1.2	1.5
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1533.0	1534.5	1.5	1.7	1.4
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1586.2	1588.1	1.9	1.4	0.9
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1598.3	1598.6	0.3	7.4	0.3
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1601.1	1602.1	1.0	8.5	0.9
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1660.5	1661.8	1.3	2.9	1.2
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1663.7	1664.0	0.3	3.8	0.3
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1675.4	1675.7	0.3	5.3	0.3
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1732.0	1733.0	1.0	3.8	0.8
JRD10447_W2	95392	49282	2571	-60	105	1809.6	1799.7	1800.2	0.5	10.5	0.4
JRD10447_W3	95392	49282	2571	-65	105	1791.0	1456.3	1457.0	0.7	5.2	0.5
JRD10447_W3	95392	49282	2571	-65	105	1791.0	1538.2	1538.9	0.8	2.3	0.6
JRD10447_W3	95392	49282	2571	-65	105	1791.0	1664.6	1665.6	1.0	2.3	0.8
JRD10447_W3	95392	49282	2571	-65	105	1791.0	1741.3	1742.2	0.9	1.8	0.8
JRD10447_W3	95392	49282	2571	-65	105	1791.0	1742.5	1742.9	0.4	4.9	0.4
JRD10447_W3	95392	49282	2571	-65	105	1791.0	1743.8	1744.3	0.5	3.0	0.4
WSXP2157	49322	95683	1621	-22	104	1248.5	1000.1	1000.4	0.3	17.4	0.3
WSXP2157	49322	95683	1621	-22	104	1248.5	1161.5	1161.9	0.4	5.9	0.3
WSXP2157	49322	95683	1621	-22	104	1248.5	1162.9	1163.2	0.3	10.3	0.3
WSXP2157	49322	95683	1621	-22	104	1248.5	1180.9	1181.2	0.3	7.7	0.3
WSXP2157	49322	95683	1621	-22	104	1248.5	1192.3	1193.1	0.8	2.0	0.6
WSXP2157	49322	95683	1621	-22	104	1248.5	1234.4	1234.7	0.3	4.1	0.3
WSXP2165	49348	95784	1637	-29	124	1100.0	798.8	802.6	3.8	10.4	2.9
WSXP2165	49348	95784	1637	-29	124	1100.0	805.2	808.1	2.9	1.8	1.5
WSXP2165	49348	95784	1637	-29	124	1100.0	854.6	855.0	0.4	7.9	0.3
WSXP2165	49348	95784	1637	-29	124	1100.0	855.0	856.2	1.2	8.7	1.0
WSXP2165	49348	95784	1637	-29	124	1100.0	858.0	858.4	0.4	7.7	0.3
WSXP2165	49348	95784	1637	-29	124	1100.0	864.2	867.5	3.3	31.3	2.9
WSXP2165	49348	95784	1637	-29	124	1100.0	868.7	869.7	0.9	15.3	0.7
WSXP2165	49348	95784	1637	-29	124	1100.0	906.4	906.9	0.5	12.7	0.4
WSXP2165	49348	95784	1637	-29	124	1100.0	915.5	916.4	0.9	10.9	0.7
WSXP2165	49348	95784	1637	-29	124	1100.0	917.3	918.0	0.7	2.6	0.4
WSXP2165	49348	95784	1637	-29	124	1100.0	931.9	932.2	0.3	47.0	0.3
WSXP2165	49348	95784	1637	-29	124	1100.0	937.1	937.7	0.6	19.0	0.5
WSXP2165	49348	95784	1637	-29	124	1100.0	950.8	952.5	1.7	5.8	1.5
WSXP2165	49348	95784	1637	-29	124	1100.0	965.0	968.2	3.2	4.3	3.1
WSXP2165	49348	95784	1637	-29	124	1100.0	971.4	972.2	0.8	1.9	0.6
WSXP2165	49348	95784	1637	-29	124	1100.0	986.9	989.6	2.7	5.4	2.5
WSXP2165	49348	95784	1637	-29	124	1100.0	991.5	993.0	1.5	4.5	0.8
WSXP2165	49348	95784	1637	-29	124	1100.0	995.4	996.7	1.3	6.0	1.2
WSXP2165	49348	95784	1637	-29	124	1100.0	1010.3	1015.3	5.0	3.4	3.5
WSXP2165	49348	95784	1637	-29	124	1100.0	1017.6	1020.4	2.8	4.0	2.6
WSXP2165	49348	95784	1637	-29	124	1100.0	1037.0	1037.3	0.3	3.8	0.3
WSXP2165	49348	95784	1637	-29	124	1100.0	1061.6	1063.0	1.4	1.6	1.0
WSXP2165	49348	95784	1637	-29	124	1100.0	1064.2	1067.0	2.8	1.3	2.2
WSXP2165	49348	95784	1637	-29	124	1100.0	1080.0	1081.7	1.7	1.5	1.5
WSXP2165	49348	95784	1637	-29	124	1100.0	1086.0	1087.1	1.1	4.2	0.9

PARADIGM SIGNIFICANT INTERSECTIONS

Drill Hole #	Easting (MGA)	Northing (MGA)	Drill hole collar RL (MGA)	Dip (degrees)	Azimuth (degrees, MGA)	End of hole depth (m)	Downhole From (m)	Downhole To (m)	Downhole Intersection (m)	Au (gpt) uncut	Est True Thickness (m)
PDDD16054	301977	6627137	422	-60	49	231	42.0	43.0	1.0	6.3	0.8
PDDD16054	301977	6627137	422	-60	49	231	46.0	50.0	4.0	9.2	3.3
PDDD16054	301977	6627137	422	-60	49	231	180.0	181.0	1.0	7.2	0.7
PDDD16068	302033	6627063	421	-61	50	231	37.0	43.5	6.5	5.3	5.4
PDDD16076	301976	6627137	422	-69	52	255	197.9	198.5	0.6	6.8	0.5
PDDD16076	301976	6627137	422	-69	52	255	215.9	219.0	3.1	7.8	2.4
PDDD17123	301906	6627117	422	-60	52	350	299.6	300.4	0.8	11.7	0.6
PDDD17123	301906	6627117	422	-60	52	350	302.0	305.0	3.0	2.9	2.1
PDDD17123	301906	6627117	422	-60	52	350	307.0	308.0	1.0	4.3	0.7
PDDD17124	301956	6627039	422	-62	80	292	231.4	232.8	1.4	26.9	1.1
PDDD17124	301956	6627039	422	-62	80	292	234.0	237.2	3.2	6.5	1.7
PDDD17125	301930	6627182	422	-59	105	274	211.9	219.0	7.1	10.8	4.6
PDDD17125						*Including*	216.5	217.0	0.7	61.4	0.4
PDDD17127	302010	6627241	421	-62	104	180	167.0	168.0	1.0	2.9	0.6
PDDD17128	302014	6627202	422	-60	76	165	68.0	68.3	0.3	9.9	0.3
PDDD17128	302014	6627202	422	-60	76	165	89.7	92.1	2.3	5.7	2.0
PDDD17128	302014	6627202	422	-60	76	165	96.4	97.2	0.8	3.0	0.5
PDDD17129	301978	6627234	422	-60	74	217	188.3	190.3	2.1	4.0	1.6
PDDD17129						*Including*	189.8	190.3	0.5	10.2	0.4
PDDD17130	301944	6627143	422	-65	72	340	221.6	222.4	0.8	51.0	0.6
PDDD17130	301944	6627143	422	-65	72	340	228.9	229.8	0.9	5.1	0.6
PDDD17130	301944	6627143	422	-65	72	340	231.8	235.7	4.0	20.6	2.5
PDDD17130	301944	6627143	422	-65	72	340	274.9	275.2	0.3	12.1	0.2
PDDD17131	301863	6627206	423	-60	76	450	336.6	338.2	1.6	1.3	1.5
PDDD17131	301863	6627206	423	-60	76	450	377.0	378.0	1.0	10.8	0.8
PDDD17132	301864	6627165	423	-65	75	442	61.0	63.0	2.0	4.5	1.3
PDDD17132	301864	6627164	421	-65	74	442	401.9	403.9	2.0	3.2	1.7
PDDD17134	301977	6627275	421	-71	73	185	172.1	172.4	0.3	4.8	0.2
PDDD17135	301920	6627261	423	-60	101	312	94.0	95.0	1.0	2.6	0.5
PDDD17135	301920	6627261	423	-60	72	312	228.0	229.0	1.0	2.8	0.7
PDDD17135	301920	6627261	423	-60	72	312	234.5	236.3	1.8	2.1	1.5
PDDD17136	301919	6627261	422	-67	74	300	206.0	206.4	0.4	11.2	0.3
PDDD17136	301919	6627261	422	-67	74	300	245.3	246.0	0.7	9.1	0.5
PDDD17136	301919	6627261	422	-67	74	300	261.1	273.8	12.7	2.3	7.8
PDDD17137	301848	6627242	423	-60	76	343	318.3	321.7	3.4	20.4	2.7
PDDD17137						*including*	320.7	321.2	0.5	110.0	0.4
PDDD17138	301848	6627242	423	-65	76	505	195.2	195.5	0.3	25.1	0.2
PDDD17138	301848	6627242	423	-65	76	505	210.6	210.9	0.3	12.8	0.2
PDDD17138	301848	6627242	423	-65	76	505	286.7	287.0	0.3	11.2	0.2
PDDD17139	301830	6626962	422	-63	54				NSI		
PDDD17147	301873	6626845	422	-61	56	309	254.4	255.1	0.7	13.4	0.6
PDDD17148	301873	6626845	422	-69	57	354	239.1	239.7	0.6	9.5	0.3
PDDD17148	301873	6626845	422	-69	57	354	295.7	297.0	1.3	11.3	0.9
PDDD17149	301873	6626845	422	-73	61	368	311.1	311.8	0.7	8.2	0.5
PDDD17149	301873	6626845	422	-73	61	368	339.2	343.0	3.9	2.2	3.2
PDDD17149	301873	6626845	422	-73	61	368	339.2	343.0	3.9	2.2	3.0
PDDD17150	301875	6626797	421	-55	82	317	257.6	258.4	0.8	2.5	0.7
PDDD17151	301875	6626797	421	-57	81	225			NSI		
PDDD17151A	301875	6626797	421	-65	53	342	317.0	317.9	0.9	1.9	0.6

PARADIGM SIGNIFICANT INTERSECTIONS

Drill Hole #	Easting (MGA)	Northing (MGA)	Drill hole collar RL (MGA)	Dip (degrees)	Azimuth (degrees, MGA)	End of hole depth (m)	Downhole From (m)	Downhole To (m)	Downhole Intersection (m)	Au (gpt) uncut	Est True Thickness (m)
PDDD17152	301875	6626747	421	-52	52	358	282.7	283.1	0.4	11.9	0.4
PDDD17153	301875	6626747	421	-59	55	364	229.8	231.7	1.9	13.5	1.4
PDDD17153	301875	6626747	421	-59	55	364	256.5	257.4	0.9	19.2	0.7
PDDD17153	301875	6626747	421	-59	55	364	260.0	261.0	1.0	10.2	0.8
PDDD17154	301875	6626747	421	-63	53	418	331.4	332.8	1.4	3.3	1.1
PDDD17154	301875	6626747	421	-63	53	418	331.4	332.8	1.4	3.3	1.1
PDDD17156	301922	6626684	420	-64	53	482	NSI				
PDDD17157	301875	6626797	421	-73	54	420	360.0	361.3	1.3	2.4	1.2
PDDD17158	301872	6626756	421	-68	53	442	192.5	193.8	1.4	121.7	0.3
PDDD17159W1	301883	6626704	421	-63	49	415	368.6	378.1	9.6	7.8	8.2
PDDD17159W1						*Includes*	371.1	371.4	0.3	45.0	0.3
PDDD17159W1						*Includes*	372.5	372.8	0.3	140.0	0.3
PDDD17160	301937	6627038	421	-61	74	313	261.0	263.0	2.0	7.6	1.6
PDDD17160	301937	6627038	421	-61	74	313	265.4	265.9	0.5	16.4	0.4
PDDD17160	301937	6627038	421	-61	74	313	273.9	277.7	3.9	31.3	2.5
PDDD17161	301955	6626982	421	-66	76	333	227.3	227.7	0.4	48.9	0.3
PDDD17162	301992	6626994	420	-60	76	268	174.4	175.3	0.9	8.4	0.6
PDDD17162	301992	6626994	420	-60	76	268	187.0	188.0	1.0	15.6	0.8
PDDD17165	302021	6627003	421	-60	74	250	83.7	84.0	0.3	121.0	0.3
PDDD17165	302021	6627003	421	-60	74	150	214.0	214.3	0.3	38.1	0.2
PDDD17175	301962	6627017	421	-60	76	225	99.0	100.0	1.0	14.3	0.6
PDDD17175	301962	6627017	421	-60	76	225	192.1	199.1	7.0	1.8	4.5
PDDD17175	301962	6627017	421	-60	76	225	227.4	227.9	0.5	12.8	0.3
PDDD17176	302007	6626979	420	-69	83	289	235.1	236.5	1.4	69.3	0.7
PDDD17176	302007	6626979	420	-69	83	289	247.6	248.5	0.9	19.1	0.2
PDDD17177	302024	6626980	420	-64	84	232	148.1	149.0	0.9	24.1	0.2
PDDD17177	302025	6626978	421	-64	84	230	148.1	149.0	0.8	24.1	0.2
PDDD17178	302044	6626978	421	-63	87	284	229.5	229.9	0.5	20.0	0.3
PDRC16088	301585	6627326	426	-60	67	196	NSI				
PDRC16097	302295	6627223	420	-59	49	200	NSI				

PAULSENS VOYAGER WEST SIGNIFICANT INTERSECTIONS

Drill Hole #	Easting (Mine Grid)	Northing (Mine Grid)	Drill hole collar RL (Mine Grid)	Dip (degrees)	Azimuth (degrees, Mine Grid)	End of hole depth (m)	Downhole From (m)	Downhole To (m)	Downhole Intersection (m)	Au (gpt) uncut	Est True Thickness (m)
PDU4164	8044	50419	131	-59	150	197.6	69.8	71.4	1.6	2.2	1.2
PDU4164	8044	50419	131	-59	150	197.6	137.4	139.0	1.6	16.3	1.2
PDU4164	8044	50419	131	-59	150	197.6	151.0	152.0	1.0	10.6	0.6
PDU4164	8044	50419	131	-59	150	197.6	160.9	161.5	0.6	6.8	0.5
PDU4164	8044	50419	131	-59	150	197.6	168.1	169.0	0.9	4.4	0.8
PDU4166	8043	50419	130	-54	163	173.8	63.0	63.5	0.6	3.3	0.5
PDU4166	8043	50419	130	-54	163	173.8	132.0	132.4	0.4	2.6	0.4
PDU4166	8043	50419	130	-54	163	173.8	145.8	146.1	0.4	12.3	0.4
PDU4167	8043	50419	130	-62	163	194.8	147.0	147.5	0.5	46.7	0.2
PDU4167	8043	50419	130	-62	163	194.8	153.8	154.1	0.4	9.0	0.2
PDU4168	8044	50419	131	-70	163	185.7	162.0	163.0	1.0	4.6	0.3
PDU4168	8044	50419	131	-70	163	185.7	181.8	182.1	0.3	6.4	0.1
PDU4169	8043	50419	131	-54	174	212.6	64.0	64.8	0.8	4.8	0.6
PDU4169	8043	50419	131	-54	174	212.6	151.6	152.3	0.6	8.0	0.5
PDU4170	8043	50419	131	-61	174	224.7	73.0	73.7	0.7	3.1	0.4
PDU4170	8043	50419	131	-61	174	224.7	147.8	148.5	0.7	20.4	0.5
PDU4170	8043	50419	131	-61	174	224.7	163.0	163.8	0.8	4.1	0.7
PDU4171	8043	50419	130	-68	177	227.0	82.0	82.5	0.6	2.8	0.4
PDU4171	8043	50419	130	-68	177	227.0	159.5	160.0	0.5	1.8	0.4
PDU4171	8043	50419	130	-68	177	227.0	191.0	192.0	1.0	2.7	0.8
PDU4172	8044	50419	131	-55	186	240.0	199.0	200.0	1.0	5.3	0.5
PDU4172	8044	50419	131	-55	186	240.0	219.1	222.5	3.5	14.3	1.9
PDU4173	8044	50419	131	-62	186	249.1	NSI				
PDU4173	8044	50419	131	-62	186	249.1	NSI				
PDU4174	8043	50419	130	-71	189	215.7	161.2	162.6	1.4	13.4	0.3
PDU4174	8043	50419	130	-71	189	215.7	164.2	167.3	3.2	9.6	0.9
PDU4174	8043	50419	130	-71	189	215.7	197.5	198.2	0.7	6.9	0.1
PDU4264	8031	50420	130	-61	193	290.9	232.0	233.0	1.0	3.5	0.9
PDU4266	8031	50420	131	-53	207	245.6	NSI				
PDU4267	8032	50420	131	-61	207	245.9	211.0	212.3	1.3	13.2	0.4

APPENDIX C – TABLE 1s

JORC Code, 2012 Edition – Table 1 Report
Jundee (Open Pits) - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling is by both diamond drilling (DD) and Reverse Circulation (RC) drilling completed by both NSR and previous operators. Most RC drilling and sampling was undertaken by previous operators with only a small volume (<5% of total RC) completed by NSR. DD samples are generally NQ2 core with sample intervals defined by the geologist to honour geological boundaries ranging from 0.3 to 1.2m in length. RC samples are collected via rig-mounted static cone splitter with sample falling though a riffle splitter or inverted cone splitter, splitting the sample in 88%/9%/3% ratio. 9% split retained for 1m composites and 3% split retained for 4m composites. 1m samples are sent for further analysis if any 4m composites return a gold value > 0.1ppm or intervals containing alteration/mineralisation failed to return a significant composite assay result. NSR Resource definition drilling routinely collects 1m composites RC and DD sampling by previous operators are assumed to be industry standard at that time often using 1m samples after initial 4m composites. The majority (>90%) of samples used for Mineral Resource estimates are RC except for the Cook Deposit (62%).
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	DD core is aligned and measured by tape, comparing back to down hole core blocks consistent with industry practice. RC metre intervals are delineated with spray paint to determine metres drilled. Sample rejects is left on the sample pad to indicate metres drilled for the hole. RC and surface core drilling completed by previous operators (pre-2002) to industry standard at that time.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Diamond drilling is completed to industry standard using varying sample lengths (0.3 to 1.2m) based on geological intervals, which are then crushed and pulverised to produce a ~200g pulp sub sample to use in the assay process. Diamond core samples are fire assayed (50g charge) and screen fire assayed for vis gold. Visible gold is occasionally encountered in core. RC sampling to industry standard at the time of drilling where ~4kg samples are pulverised to produce a ~200g pulp sample to utilise in the assay process. RC samples were fire assayed (50g charge).
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	RC drilling is carried out using a face sampling hammer and a 130mm diameter bit. Previous operators surface diamond drilling carried used both HQ2, HQ3, PQ2 (triple tube) and NQ2 (standard tube) techniques. Sampled sections are generally NQ2. Core is routinely orientated using the ORI-shot device.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC – Approximate recoveries are sometimes recorded as percentage ranges based on a visual and weight estimate of the sample. DD – Recoveries are recorded as a percentage calculated from measured core verses drilled intervals.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Diamond drilling practice results in high core recovery due to the competent nature of the ground. RC and diamond drilling by previous operators (pre-2002) are to industry standard at that time.
	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.	There is no known relationship between sample recovery and grade, diamond drill sample recovery is very high.

Criteria	JORC Code explanation	Commentary
Logging	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.	DD core and RC chip samples have been logged by qualified geologists to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies Percussion holes logging were carried out on a metre by metre basis and at the time of drilling. Surface DD core and RC logging completed by previous operators (pre-2002) assumed to be to industry standard.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is Qualitative and Quantitative, all core is photographed wet (some older core is pre-digital, photos not all reviewed). Visual estimates are made of sulphide, quartz and alteration as percentages.
	The total length and percentage of the relevant intersections logged.	100% of all DD and RC drilling is logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	DD core is half cut with an Almonté diamond core saw. Sample intervals are defined by a qualified geologist to honour geological boundaries. The left half is archived. All mineralised zones are sampled plus associated visibly barren material in contact with mineralised zones. Core is sampled on the width of the geological/mineralized structure with a minimum sample length of 0.3m and a maximum sample length of 1.2m. Total weight of each sample generally does not exceed 5kg. For pre-Northern Star (NSR) best practice is assumed.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	RC drilling uses a cyclone mounted, 3 tier riffle splitter or inverted cone splitter. Pre NSR, RC sub-sampling assumed to be at industry standard at that time.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	DD core is dried at 100°C to constant mass, all samples below approximately 4kg are totally pulverised in LM5's to nominally 90% passing a 75µm screen. The few samples generated above 4kg are crushed to <6mm and riffle split first prior to pulverisation. RC samples are dried at 100°C to constant mass, all samples below approximately 3kg are totally pulverised in LM5's to nominally 85% passing a 75µm screen. Samples generated above 4kg are crushed to <6mm and cone split to nominal mass prior to pulverisation. In 2012, Francois-Bongarcon (Agoratek International) conducted a heterogeneity studies, audit of site laboratory, and audit of plant samplers. Confirmed that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results. For RC samples, no formal heterogeneity study has been carried out or monographed. An informal analysis suggests that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results For pre- NSR samples, best practice is assumed.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Repeat analysis of pulp samples (all sample types) occurs at an incidence of 1 in 20 samples. RC drilling by previous operators to industry standard at that time.
	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.	Field duplicates, (i.e. other half of cut core) have not been routinely assayed. RC drilling by previous operators assumed to be to industry standard at that time. NSR RC Resource definition drilling routinely collects 1 or 2 field duplicates per drill hole.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate. No formal nomograph study has been conducted on the RC primary sub sample split. Industry standard practice supports splitting of primary sub samples at particle sizes of <6mm and P_{80} 75µm.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	For all drill samples, gold concentration was determined by fire assay using the lead collection technique with a 50-gram sample charge weight. An AAS finish was used to be considered as total gold. Various multi-element suites are analysed using a four-acid digest with an AT/OES finish. RC drilling by previous operators (pre-2002) to industry standard at the time.
	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.	Not applicable to this report.

Criteria	JORC Code explanation	Commentary
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	The QAQC protocols used include the following for all drill samples: - Field QAQC protocols used for all drill samples include commercially prepared certified reference materials (CRM) inserted at an incidence of 1 in 30 samples. The CRM used is not identifiable to the laboratory with QAQC data is assessed on import to the database and reported monthly, quarterly and yearly. - NSR RC Resource definition drilling routinely inserts field blanks and monitor their performance. - Laboratory QAQC protocols used for all drill samples include repeat analysis of pulp samples occurs at an incidence of 1 in 20 samples and screen tests (percentage of pulverised sample passing a 75µm mesh) are undertaken on 1 in 40 samples. - The laboratories' own standards are loaded into the database and the laboratory reports its own QAQC data monthly. - In addition to the above, about 3% of diamond drill samples are sent to a check laboratory. Samples for check -assay are selected automatically from holes based on the following criteria: grade above 1gpt or logged as a mineralized zone or is followed by feldspar flush or blank. - Failed standards are generally followed up by re-assaying a second 50g pulp sample of all samples in the fire above 0.1ppm by the same method at the primary laboratory. Both the accuracy component (CRM's and third party checks) and the precision component (duplicates and repeats) of the QAQC protocols are thought to demonstrate acceptable levels of accuracy and precision. QAQC protocols for surface RC and DD drilling by previous operators (pre-2002) is assumed to be industry standard.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections not verified.
	The use of twinned holes.	There is no purpose drilled twinned holes.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Primary data is imported into SQL database using semi-automated or automated data entry with hard copies of core assays and surveys are stored at site. Visual checks are part of daily use of the data in Vulcan. Data from previous operators thoroughly vetted and imported to SQL database.
	Discuss any adjustment to assay data.	The first gold assay is almost always utilised for any Resource estimation except where evidence from re-assaying and/or check-assaying dictates. A systematic procedure utilizing several re-assays and/or check assays is in place to determine when the final assay is changed from the first gold assay. Some minor adjustments have been made to overlapping data.
Location of data points	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.	Collar positions are recorded using conventional survey methods based on Leica TS15 3" total stations and Trimble R10 GNSS instruments. The location of each station is referenced to state-wide network of Standard Survey Marks (SSM) established and coordinated by the Department of Land Administration (WA Government). Where regional drill hole positions are distant from the SSM network, the world wide Global Navigational Satellite System (GNSS) network is used. Positional checks are carried out using a combination of existing known positions (usually based on prominent landmarks) and grid referenced information such as ortholinear rectified photogrammetry based on the Australian Map Grid 1984 (AMG84_51) or Map Gird of Australia MGA94. Collar coordinates are recorded in MGA94, AMG84 or Local Jundee Grid (JUNL2) dependant on the location and orientation of ore-bodies. Cross checks were made on the survey control points and data in June 2005. Collar information is stored in both local coordinates MGA94 and AMG84 coordinate in the drilling database. In-mine drill-hole collars are normally accurate to 10 cm. Surface collar RL's have been validated utilizing an airborne elevation survey by Arvista in February 2015. Multi shot cameras and gyro units were used for down-hole survey. Previous drilling has been set-out and picked up in both national and local grids using a combination of GPS and survey instruments and are assumed to be to industry standards.
	Specification of the grid system used.	Collar coordinates are recorded in MGA94 Zone 51, AMG84 Zone 51 (AMG GN) and local Jundee Grid (JUNL2) dependant on the location and orientation of ore-bodies. The difference between Jundee mine grid (GN) and magnetic north (MN) as at 31 December 2011 is 39° 35' 00" and the difference between magnetic north (MN) and

Criteria	JORC Code explanation	Commentary
		true north (TN) is 1° 34' 30". The difference between true north (TN) and AMG84 Zone 51 (AMG GN) is 1° 02' 47". The difference between true north and GDA is zero.
	Quality and adequacy of topographic control.	Topographic control is from Digital Elevation Contours (DEM) 2010, 1m contour data and site surveyed pit pickups.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	All Ore Reserves are based on a maximum drill hole spacing of 40m x 40m and all Mineral Resources are based on a maximum of 80m x 80m.
	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.	Ore Reserves are generally based on 20m x 20m drilling up to a maximum of 40m x 40m with Mineral Resources are generally based on 40m x 40m drilling up to a maximum of 80m x 80m. The data spacing and distribution is sufficient to establish geological and/or grade continuity appropriate for the Mineral Resource and classifications to be applied.
	Whether sample compositing has been applied.	Core is sampled to geology; sample compositing is not applied until the estimation stage. RC samples are initially taken as 4m composites to be replaced by 1 m samples if any 4m composite values returned a gold value > 0.1ppm or intervals containing alteration/mineralisation fail to return a significant 4m composite assay result. For RC Resource definition drilling 1 m samples are routinely collected. No RC samples greater than 1m were used in estimation.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The orientation of sampling is generally perpendicular to the main mineralisation trends. The orientation achieves unbiased sampling of all possible mineralisation and the extent to which this is known.
	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.	The drill orientation to mineralised structures biases the number of samples per drill hole. It is not thought to make a material difference in the Resource estimation. As the opportunity arises, better angle holes are infill drilled.
Sample security	The measures taken to ensure sample security.	All samples are selected, cut and bagged in tied numbered calico bags, grouped in larger tied plastic bags, and placed in large sample cages with a sample submission sheet. The cages are either sent to the site laboratory or are transported via freight truck to Perth, with consignment note and receipted by external and independent laboratory All sample submissions are documented and all assays are returned via email and hard copy. Sample pulp splits from the site lab are stored at the Jundee mine site and those from the Newburn Lab in Perth are stored at the Newburn Lab. RC samples processed at SGS, Min Analytical and Bureau Veristas have had the bulk residue discarded and pulp packets sent to Jundee mine site for long term storage. Pre NSR operator sample security assumed to be similar and adequate.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	Historical audits of all Jundee data were carried out by previous operators. In 2012, Francois-Bongarcon (Agoratek International) conducted a heterogeneity studies, audit of site laboratory, and audit of plant samplers. Both audits found the sampling techniques and data to be adequate. All recent NSR sample data has been extensively QAQC reviewed both internally and externally. Pre-NSR data QAQC audits found to be minimal although in line with industry standards of the time.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	The Jundee Project consists of 62 Mining Leases and 1 General Purpose Lease covering a total area of approximately 57,422.2 Ha. All are registered in the name of Northern Star Resources Limited. The Project also includes 23 Miscellaneous Licences, 3 Groundwater Licenses, a Pipeline License and the Jundee Pastoral Lease covering the bore fields, roads, airstrip, and gas pipeline. There are numerous access agreements in place including access rights over part of M53/193 which lies contiguous to, and beneath, the General Purpose Lease on which the Jundee processing plant is located. There are no heritage issues with the current operation. The majority of the Jundee leases are granted Mining Leases prior to 1994 (pre-Mabo) and as such Native Title negotiations are not required. During 2004, two agreements where struck between Ngaanyatjarra Council (now Central Desert Native Title Services (CDNTS)) and NYO, these agreements being the Wiluna Land Access Agreement 2004 and the Wiluna Claim Heritage Agreement 2004.
	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.	All leases and licences to operate are granted and in the order for between 3 and 21 years.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Data relevant to this Resource was predominantly compiled by NYO (Newmont Yandal Operations) who operated the mine from 2002 -June 2014. Prior to 2002, data gathered by others is as follows: The Jundee/Nimary Deposits were discovered in the late 1980's/early 1990's after LAG and soil sampling by Mark Creasy (Jundee) and Hunter Resources (Nimary) identified large surface gold anomalies. The deposits were drilled out over the following years by Eagle Mining and Great Central Mines (which formed a joint venture with Creasy and later purchased his share). Open pit operations commenced in mid-1995, with the first gold poured in December 1995. Great Central Mines assumed full control of the field with its successful takeover of Eagle Mining in mid-1997. Great Central Mines was later taken over by Normandy in mid-2000, which in turn was taken over by Newmont in early-2002. All previous work is accepted and assumed to industry standard at that time.
Geology	Deposit type, geological setting and style of mineralisation.	Jundee is an Archean lode-gold mineralized deposit that is part of the Northern Yandal Greenstone belt. Gold mineralisation is controlled by a brittle fracture-system, is commonly fracture-centred, and is predominantly hosted in dolerite and basalt. Mineralisation can be disseminated or vein style host.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically summarise all drill information used. (See diagram).
	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.	Exclusion of the drill information will not detract from the understanding of the report. Holes are close spaced and tightly constrained to an active mine area.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Exploration results are not being reported in this release.
	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.	Exploration results are not being reported in this release.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results.	Exploration results are not being reported in this release.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Due to complex mineralisation geometry and varying intercept angles the true thickness is manually estimated on a hole by hole basis.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Exploration results are not being reported in this release.
Diagrams	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.	Plan view and long section view of Jundee showing drill collars is attached.
Balanced reporting	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.	Exploration results are not being reported in this release.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Exploration results are not being reported in this release.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further extensional and definition drilling is planned for FY2018.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Plans and sections of the Jundee deposit are included in this report.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Sampling and logging data is digitally entered into a tablet then transferred to an SQL based database. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly to the database from lab, logging and survey derived files. Pre NSR data considered correct.
	Data validation procedures used.	Pre-NSR and pre-NYO data has been validated by internal database administrators.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The Competent Person for this Resource report has worked on site for extensive periods between 2005 and 2017.
	If no site visits have been undertaken indicate why this is the case.	Site visits have been undertaken.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource using Vulcan and Leapfrog software. The confidence in the geological interpretation is relatively high, though a certain degree of uncertainly always remains due to the structurally complex and nuggetty nature of the ore body on a local scale. The confidence is supported by all the information and 18 years of open pit and underground operations.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drilling, oxidation surfaces, and underground style high grade ore zone interpretations.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed or put forward.
	The use of geology in guiding and controlling Mineral Resource estimation.	Drill core logging and pit mapping used to create 3D constrained wireframes.

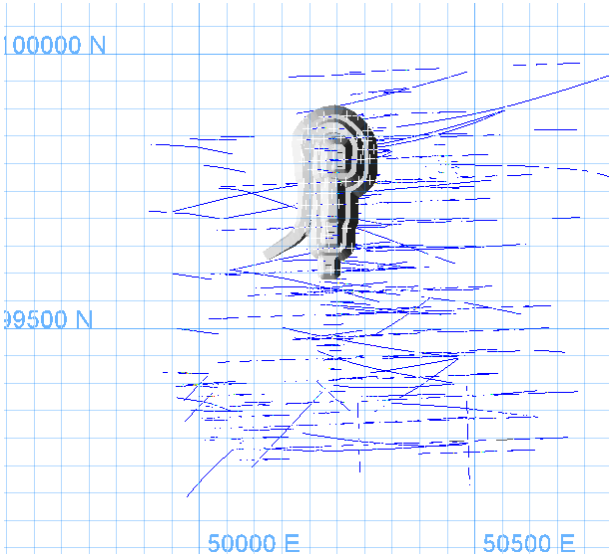
Criteria	JORC Code explanation	Commentary
	The factors affecting continuity both of grade and geology.	Continuity of the grade varies significantly, though the lodes with the greatest continuity are generally sub-parallel to the dolerite and basalt packages in which they are hosted. Splays or link lodes coming off of this main trend tend to have a shorter continuity.
Dimensions	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.	Mineralized zones are variable with true width ranging from 0.3m to 5m. They are extensive along strike and down dip, up to 1,400m and 500m respectively, but are often highly discontinuous and generally have a tabular geometry. Depth = surface to ~2123mRL (deepest extent of Open Pit Resources - Cook Resource).
Estimation and modelling techniques	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.	Domains are set by grouping lodes as dictated by their structural setting, geological mineralisation and statistical characteristics. The raw data is subdivided into domains based on geological controls and further analysed for correlation and similarity using statistics. The purpose of this analysis is to determine further domaining of the data for variography purposes (by combining groups of lodes). Open Pit Mineral Resource estimation utilises 1m straight composite data for all RC composites coupled with seam composite generation from hangingwall to footwall) for most DD composites. Detailed exploratory data analysis is carried out on each deposit using Snowden Supervisor software. The majority of the Mineral Resource is estimated using ordinary kriging (OK). A minor proportion of the Mineral Resource is estimated using inverse distance squared (ID2). The estimation type used is dictated by the dataset size of the domain. Vulcan and Leapfrog software is used for data compilation, domain wire framing, calculating and coding composite values, estimating and reporting. Maximum distance of extrapolation from data points was statistically determined and varies by domain. Block model volumes were compared to wireframe volumes to validate sub-blocking. Where OK or ID2 estimates were used, treatment of extreme high grades was dealt with by using a cap grade strategy and high grade restraining.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Both historical estimates and mapping/production is comparable with new estimate.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	All Open Pit Mineral Resource models use a 1m straight composite generation based on RC sample length where the parent block sizes are 10 m in strike, 3m in RL, and 3m across strike direction. Sub-block sizes are 1m in strike, 1m in RL, and 1m across strike direction. Vause block models have a parent block sizes of 5 m in strike, 2.5 m in RL, and 4m across strike direction. Sub-block sizes are 2.5 m in strike, 1.25m in RL, and 1m across strike direction. Average drill spacing ranges between 25m x 25m and 10m x 10m. Ore Reserves are generally based on 20m x 20m drilling up to a maximum of 40m x 40m. Mineral Resources are generally based on 40m x 40m drilling up to a maximum of 80m x 80m.
	Any assumptions behind modelling of selective mining units.	A 2m minimum mining width for open pit environment is assumed.
	Any assumptions about correlation between variables.	There is no correlation between variables.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralised wireframes are created within the geological shapes based on drill core logs, mapping and grade. Low grades can form part of an ore wireframe. Estimations are constrained by the interpretations.
	Discussion of basis for using or not using grade cutting or capping.	Top cuts were determined by a range of statistical techniques including analysis of histogram, Log-probability and Mean-CV plots: • Contained Metal Plots assess contribution of the highest values on the quantity of metal in an estimate, • Coefficient of Variation plots analyse impact top cuts have on CV. A range of top cuts are then selected for each domain utilising the above strategies and an appropriate top cut chosen subsequent to further examination in order to assess sensitivity of selected cap grades and associated risk. Metal estimated in the Resource models are finally reconciled with production models of like areas to determine the appropriateness of the high grade treatment on the assays.

Criteria	JORC Code explanation	Commentary
		No top cutting or capping of high grades is done at the raw sample or compositing stage. For OK and ID², treatment of the high grade assays occur at the estimation stage. In MIK estimation this occurs in the form of the grade assigned to the highest indicator bin. Top cuts vary by domain and range from 18gpt – 2,000gpt.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	The Mineral Resource estimate was validated using processes that are based on a combination of visual, graphical and reconciliation validations summarised as: • Visual validation of the lode and lithology coding of both the composite data and the block model. • Comparison of lode wireframe volumes to block model volumes. • Visual validation of Mineral Resource estimate against composite data in plan, section, and 3D. • Sensitivity to top-cut values uses a variety of top-cuts which are compared to themselves and to the un-cut nearest neighbour estimate at a variety of cut-offs. • Comparison of nearest neighbour, ID2 and OK estimates to the final estimate (generally OK & ID2). These comparisons are conducted through visual validation and trend analysis along Northing, Easting and RL slices. • Comparison with previous Mineral Resource estimates. Global, level and lode tonnages and grades, at various elemental cut-offs were compared, and, given the changes in support data, were consistent. • Comparison of Mineral Resource estimate versus grade control models. • Statistical comparison of composites versus all estimates in block model with trend analysis plots for each domain produced by Northing / Easting / RL. • Statistical comparison of composites grades versus lode grades in a lode by lode basis. • Change of Support validation The Mineral Resource estimate generally shows a reasonably reflection of the composites where there are high numbers of composites used in the estimate. When the numbers of samples reduce the accuracy of the estimation suffers and a more significant deviation is noted between the Mineral Resource estimate and associated composite data. These deviations are considered when assigning a Resource classification.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis. Moisture content within the ore is expected to be low.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	All Jundee Open Pit Mineral Resources are reported at a 0.6gpt cut-off grade.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	A 2m minimum mining width for Open Pit environment is assumed and incorporated into the modelling and estimation. All the Resources have been reported within $1,750 AUD optimisation shell.
Metallurgical factors or assumptions	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.	Assumed all material will be trucked and processed in the Jundee Mill. Recovery factors vary for the various mining areas and are based on lab testing and on-going operational experience. No metallurgical assumptions have been built or applied to the Resource model.
Environmental factors or assumptions	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 green fields project, may not always be well advanced, the status of early consideration of these potential environmental impacts	The Project currently possesses all necessary government permits, licenses and statutory approvals in order to be compliant with all legal and regulatory requirements.

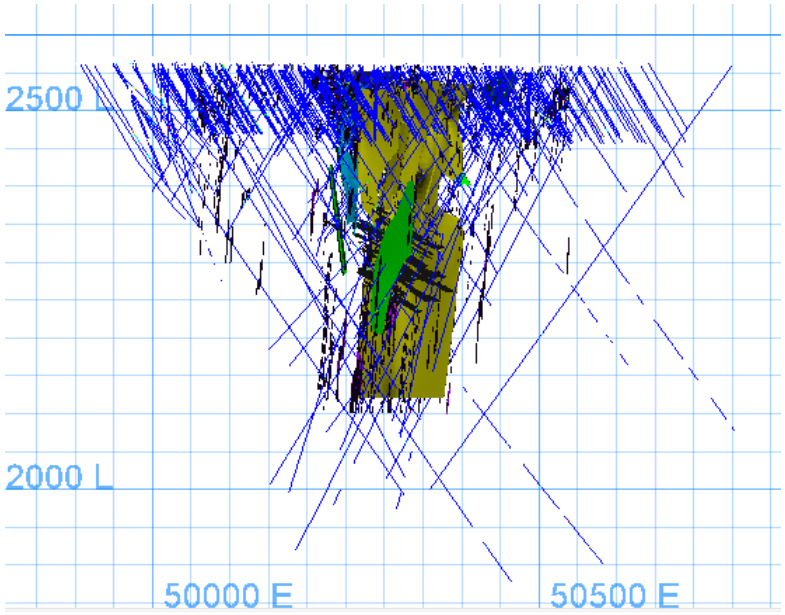
Criteria	JORC Code explanation	Commentary
	should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	RC bulk density values used were based on analysis of grab samples obtained during excavation of open cut mines. Calculated averages were applied to density boundaries for each model. DD bulk density values are based on an updated study of the average lithological densities across the mine site completed in 2013. This study consisted of a detailed statistical analysis of 72,634 measurements that have been recorded from all deposits. These values are also in agreement with over 10 years of production data.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	Bulk density measurements for core samples are taken daily using the water displacement technique. One bulk density measurement is taken for each lithology in every hole every day. An attempt is made to collect a bulk density measurement from every mineralized zone and each lithology represented in drill hole core. A total of 72,634 bulk density measurements have been taken. Historical bulk density measurements for RC Samples were taken using the water displacement technique. All oxide/transitional samples were coated in wax before analysis whilst fresh rock samples were analysed as per DD samples.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Individual bulk densities are applied in accordance with specific lithologies, mineralisation, and weathering states.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Measured Resources are defined from grade control models based on geological mapping, diamond and RC drill holes which are imported into Vulcan and modelled in 3D. Indicated Resources are defined by drilling which is generally 25m x 25m and may range up to 40m x 40m maximum. Material classified as Indicated are supported by a minimum of 5 RC and Diamond drill holes or a minimum of 3 drill holes when drill spacing is 25m x 25m or less and there is grade and geological continuity. Inferred Resources are defined on a nominal 40m x 40m drilling pattern and may range up to 80m x 80m. Resources based on less than 40m x 40m spaced drilling, but which have a low level of confidence in the geological interpretation may also be classified as inferred.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Input and geological data is assumed accurate backed up by previous successful mining history at the site on this mineralisation.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This Mineral Resource estimate is considered representative with comments noted in the discussion below.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The Mineral Resource estimates, methodology and systems have been subject to four internal audits by previous operators (NYO) and senior technical personnel over the last 10 years.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This Mineral Resource estimate is considered as robust and representative of the Jundee mineralisation with local estimates considered variable in nature. The application of geostatistical methods has supported to increase the confidence of the model and quantify the relative accuracy of the Resource on a global scale and against actual production reconciliation.
	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.	This Resource report relates to the Jundee deposits and is likely to have local variability within a global assessment further supported and reconciled against actual mine production.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Comparison with previous Mineral Resource estimates and production data was undertaken. Global, level and lode tonnages and grades, at various elemental cut-offs were compared, and, given the changes in support data, were consistent.

JUNDEE PITS - REPRESENTATIVE PLANS & CROSS SECTIONS

COOK RESOURCE



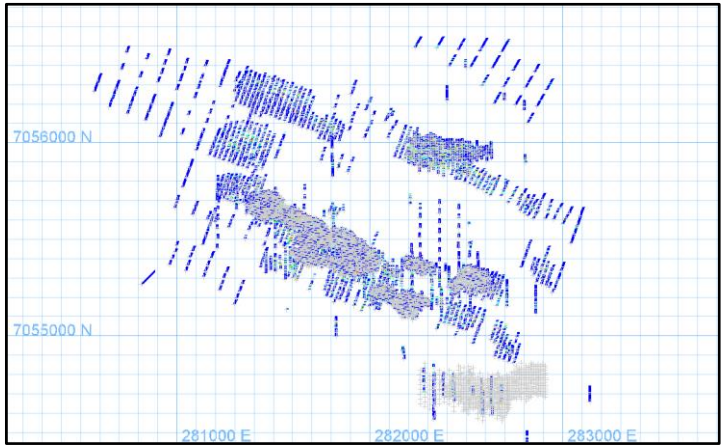
Plan view: Cook Resource drill collars



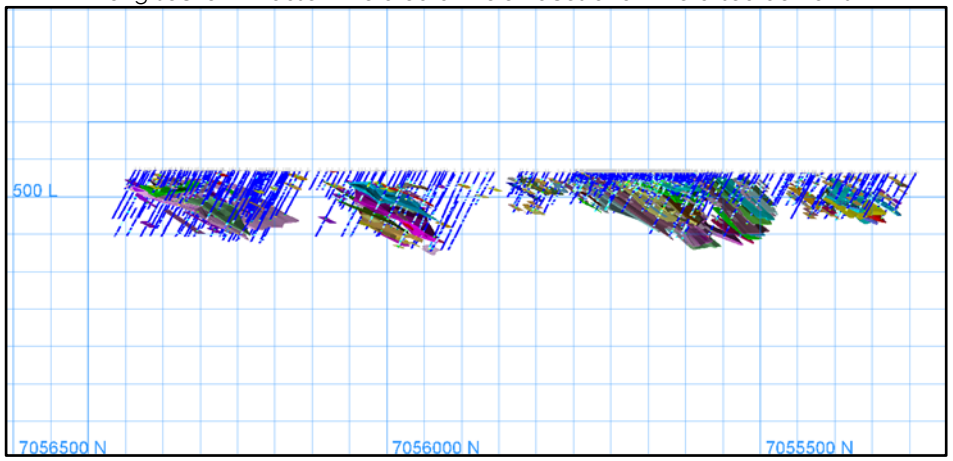
Long Section – Cook resoruce drillhole traces and mineralised domains

VAUSE RESOURCE

Plan view: Vause mine area Drill hole collars

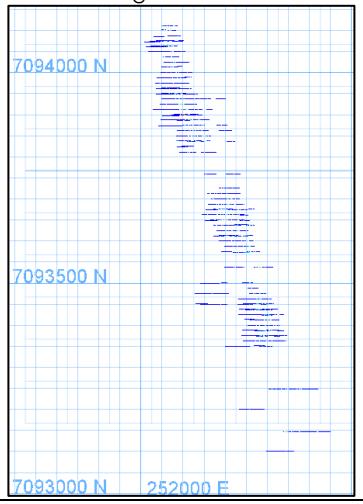


Long Section – Vause mine area drillhole traces and mineralised domains

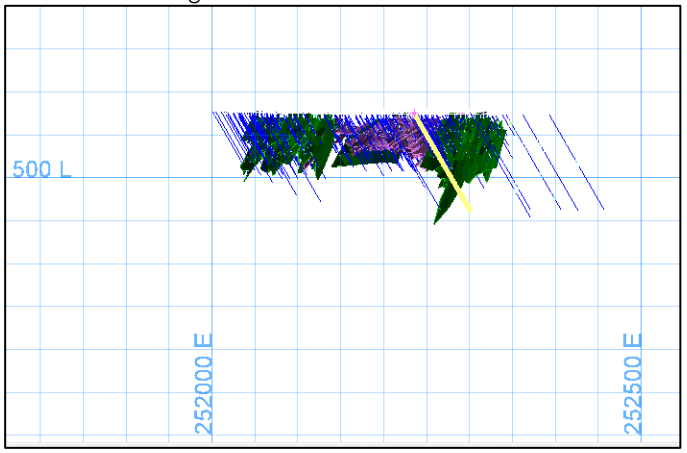


DESERT DRAGON RESOURCE

Plan view: Desert Dragon mine area Drill hole collars

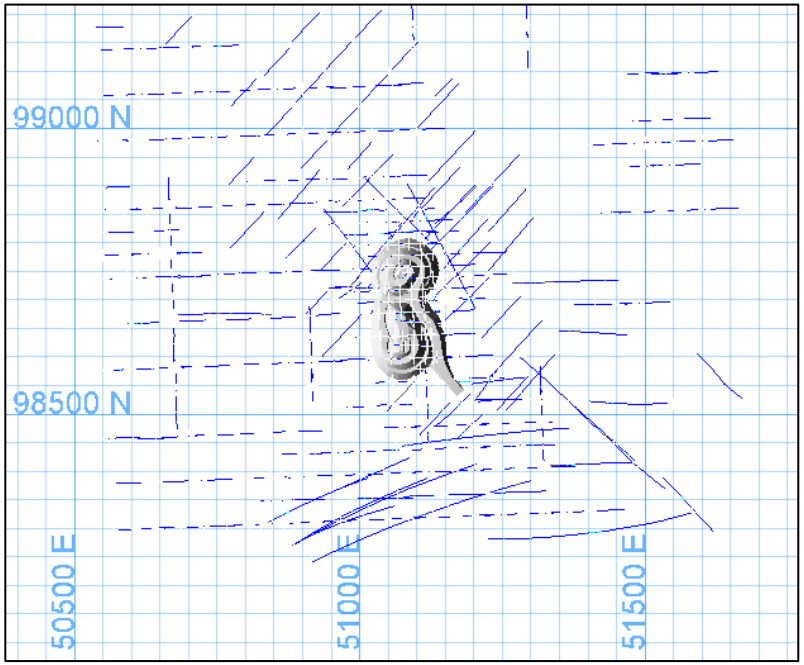


Long Section – Desert Dragon mine area drillhole traces and mineralised domains

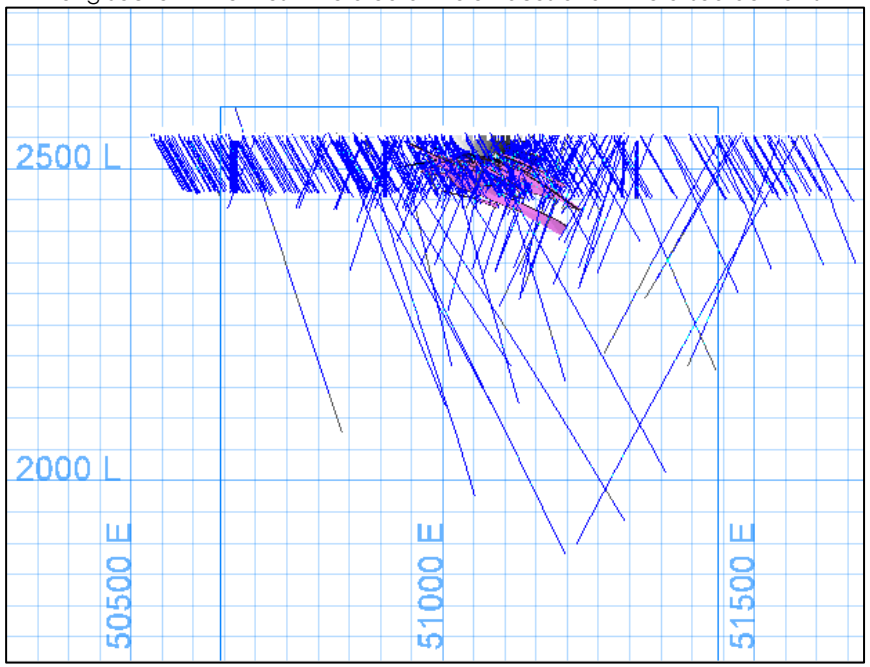


MENZIES RESOURCE

Plan view: Menzies mine area Drill hole collars



Long Section – Menzies mine area drillhole traces and mineralised domains



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	The Mineral Resource estimate for the Vause Project used as a basis for the conversion to the Ore Reserve estimate reported was compiled by Juan Gutierrez of Northern Star Resources. Reported ore Reserve is based on updated or depleted Resource models for all areas of Vause.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	Mineral Resources are reported inclusive of ore Reserves.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	A site visit has been completed by Brad Valiukas (Technical Services Manager and Principal Reviewer of this document) and Jeff Brown (Group Mining Engineer and Competent Person for reporting).
	If no site visits have been undertaken indicate why this is the case.	The Competent Person is satisfied that the descriptions of the planned infrastructure and locality provided by NSR along with the surveyed 3D topography are sufficient information to carry out the mine design and classify the Ore Reserves.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	The Jundee Gold Project is a fully operational mine and has been in operations for over 20 years. The Vause mining area has been previously mined as a satellite operation providing additional mill feed to the Jundee Processing Plant.

Criteria	JORC Code explanation	Commentary
		The processing parameters have been based on previous Vause ore material processed and actual costs of the Jundee processing plant. Mining costs are based on pricing sourced from a reputable mining contractor with considerable experience in mining open pit gold mines. The schedule of rates provided were in a fixed and variable format. There is a high level of confidence in the parameters used.
	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.	A Pre-Feasibility level study has been completed.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	The pit cut-off grade has been calculated based on the key input components (processing, recovery and administration) Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. • The AUD gold price as per corporate guidance. • Mill recovery factors are based on historical data and metallurgical test work. • Variable treatment costs to open pit mining for processing is a fundamental premise in the evaluation of open pit projects. Variable cut-off grade is used in the evaluation of open pit projects.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Ore Reserves have been calculated by generating detailed mining shapes for the proposed open pits. A series of nested optimised pit shells were generated using Whittle software, an analysis of the shells was completed to select one which was then used to complete a detailed pit design to closely resemble the selected whittle shell. The Whittle optimisation used parameters generated from NSR technical personnel and technical consultants.
	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.	The selected mining methods for the Vause deposits are of a bench mining open pit method. The proposed open pits are to be mined using conventional open pit mining methods (drill, blast, load and haul) by a mining contractor utilising 120t class excavators and 50t trucks. This method is used widely in mines across Western Australia and is deemed appropriate given the nature of the ore body.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	Independent Geotechnical Consultants Dempers & Seymour Pty Ltd completed a geotechnical study for the Vause project. Recommended wall angles were applied to the Whittle optimisation and subsequent detailed pit designs.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	
	The mining dilution factors used.	A mining dilution factor of 10% of zero grade has been applied for the reporting of Reserve physicals.
	The mining recovery factors used.	A mining recovery of 95% has been applied.
	Any minimum mining widths used.	The SMU dimensions for the Reserve Estimate are 2.0 m Wide x 5.0 m High x 5.0 m Long. A minimum mining width down to 20 m for final pit extraction from the base of pit has been used.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Inferred material has not been included within this Reserve estimate (treated as waste) but has been considered in LOM planning. It is assumed that Inferred material will be converted to Reserve via grade control drilling which has been provided for and will be carried out ahead of mining.
	The infrastructure requirements of the selected mining methods.	Infrastructure required for the proposed Vause Open Pits have been accounted for and included in all work leading to the generation of the Ore Reserve estimate. As there is currently infrastructure in place for the Jundee underground operations and the life of the Vause project is limited, planned infrastructure includes: • Offices, workshops and associated facilities; • Dewatering pipeline; • Waste Dump; and • RoM Pad. Processing will be conducted at the Jundee operation; hence no processing infrastructure is required.

Criteria	JORC Code explanation	Commentary
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	The existing Jundee Processing plant will be utilised to treat the Vause ore.
	Whether the metallurgical process is well-tested technology or novel in nature.	Metallurgical test work has been completed on the Vause ore and applied to the optimisation and is well understood.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	The metallurgical recoveries for the project were set at 93.9% for oxide, 94.1% for transitional, 92.9% for fresh rock, which corresponds with historic data and metallurgical test work undertaken during previous mining.
	Any assumptions or allowances made for deleterious elements.	There has been no allowance for deleterious elements.
	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.	Approximately 2MT of Vause open pit ore has been previously processed through the Jundee Processing Plant.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable, gold only.
Environmental	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.	Jundee operates under Department of Environment and Conservation (DEC) Licence L6498/1995/11 in accordance with the Environmental Protection Act WA 1986. Jundee holds one groundwater licence GWL 151450(6) which includes the Vause mining tenement. Jundee's mine closure plan has been developed in accordance with the DMP and EPA Guidelines for Preparing Mine Closure Plans. The mine closure plan details studies such as waste rock characterisation that are to be completed before closure of the site. Vause is a satellite mining operation to Jundee with past completed open pits and is included in the Jundee Mine Closure Plan. All ore from the Vause Project will be trucked to the Jundee Gold Processing Plant for milling and as such tails storage is included in the current Jundee (DEC) licence. Dempers and Seymour Geotechnical Consultants completed a comprehensive geotechnical study for recommended wall angles and regulatory approval. There are no native title issues and the Vause mining area has been heritage cleared for mining activities. Flora & Fauna and hydrogeological studies have previously been completed.
Infrastructure	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.	All processing infrastructure is in place at Jundee. The Vause Project is a satellite pit operation and extension of the Jundee Gold Mine. The Vause project has several historic open pits and is connected to Jundee by an established haul road constructed for road train haulage. Minor infrastructure will be required at the Vause project area and has been allowed for in the cost model.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Mining costs based on mining contract rates supplied by a reputable WA based mining contractor. Mining costs were built up from first principals on mine designs supplied by NSR. Capital costs were not included in the optimised parameter inputs. Capital costs based on quotes supplied and have been included in the Vause economic cost model.
	The methodology used to estimate operating costs.	A capital and operating cost model has been developed in Excel and has been used to complete a life of mine cash flow estimate. Mining costs supplied by a reputable WA based mining contractor who built up costs from first principles from mine designs supplied by NSR.
	Allowances made for the content of deleterious elements.	Nil allowance, none expected.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of A$1,500 per ounce as per NST corporate guidance
	The source of exchange rates used in the study.	NST report in Australian dollars. Therefore, no exchange rate is used or required.
	Derivation of transportation charges.	Transportation costs for ore haulage from Vause to Jundee has been based on current NSR contractor quotes. Transportation costs also include an allowance for adequate haul road maintenance and dust suppression.

Criteria	JORC Code explanation	Commentary
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Processing costs are based on historic and actual Jundee plant processing costs. This cost component has been used to determine the cut-off grades as well as applied to the operating cash flow estimate.
	The allowances made for royalties payable, both Government and private.	WA State Government royalty of 2.5%.
Revenue factors	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.	All financial analysis and gold price have been expressed in Australian dollars and no direct exchange rates have been applied. Revenue factors within the whittle optimisation process were used. A revenue factor shell was selected and used to complete a detailed pit design. A gold price of A$1,500 per ounce has been used in the optimisation of the Vause Project. 2.5% WA State Government royalty.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	Gold doré from the mine is to be sold at the Perth mint.
	A customer and competitor analysis along with the identification of likely market windows for the product.	N/A
	Price and volume forecasts and the basis for these forecasts.	N/A
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	N/A
Economic	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.	The Ore Reserve estimate is based on a financial model that has been prepared at a "pre-feasibility study" level of accuracy economic modelling. All inputs from mining operations, processing, transportation and sustaining capital as well as contingencies have been scheduled and evaluated to generate a full life of mine cost model: • Economic inputs have been sourced from suppliers or generated from database information relating to the relevant area of discipline. • A discount rate of 5% has been applied due to the short life of the project. • The NPV of the project is positive at the assumed commodity prices.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities were conducted on metal price fluctuations of A$1,500 ± $200 per ounce. Due to the current short life, the project is not seen as highly sensitive to cost inputs.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders including traditional land owner claimants.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	None
	Any identified material naturally occurring risks.	None
	The status of material legal agreements and marketing arrangements.	None
	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.	Jundee and its satellite pits operates under Department of Environment and Conservation (DEC) Licence L6498/1995/11 in accordance with the Environmental Protection Act WA 1986. The Vause mining project is a historic mining area with mining last conducted as recently as 2007. The Vause project lies on 100% NSR granted mining tenements and is connected to the Jundee Gold Mine by a dedicated private haul road on 100% NSR owned mining tenements. The Vause project has been heritage cleared for all mining activities. The Vause Project has a valid ground water licence (GWL). No problems are anticipated when clearing permits and the mining proposal are submitted due to secured tenure, lack of native title issues, heritage clearance approved and is being undertaken in a previously mining disturbed area.

Criteria	JORC Code explanation	Commentary
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	The classification of the Vause Project Ore Reserves has been carried out in accordance with the JORC code 2012.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	No Measured Mineral Resource contributes to Probable Ore Reserves.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserves reporting processes has been subjected to an internal review by NSR Senior Technical personnel in July 2017.
Discussion of relative accuracy/ confidence	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.	The design, schedule and financial model on which the Ore Reserve is based has been completed to a "pre-feasibility study" standard, with a corresponding level of confidence.
	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.	All modifying factors have been applied to design mining shapes on a global scale.
	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.	Not applicable.
	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.	Not applicable.

JORC Code, 2012 Edition – Table 1
Jundee (Underground) – 30h June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	This deposit is sampled by diamond drilling (DD) and Reverse Circulation (RC) drilling completed by previous operators. DD - Sampled sections are generally NQ2 or BQ. Core sample intervals are defined by the geologist to honour geological boundaries ranging from 0.3 to 1.2m in length. RC - Rig-mounted static cone splitter used, with sample falling though a riffle splitter or inverted cone splitter, splitting the sample in 87.5/12.5 ratio. 12.5% Off-split retained. 87.5% split sampled using 'pipe' or 'spear' sampling tool. Generally sampled as 4m composites. 1m composites (12% split) was sent for further analysis if any 4m composite values returned a gold value > 0.1ppm or intervals containing alteration/mineralisation failed to return a significant 4m composite assay result. RC and DD sampling by previous operators are to industry standard at that time often using 1m samples after initial 4m composites. It is unknown what grade threshold triggers the 1m re-samples. The greater majority (>90%) of samples used for Reserve and Resource estimates are DD.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Core is aligned and measured by tape, comparing back to downhole core blocks consistent with industry practice. RC and surface core drilling completed by previous operators to industry standard at that time.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Diamond drilling completed to industry standard using varying sample lengths (0.3 to 1.2m) based on geological intervals, which are then crushed and pulverised to produce a ~200g pulp sub sample to use in the assay process. Diamond core samples are fire assayed (30g charge). Visible gold is occasionally encountered in core. RC sampling to industry standard at the time of drilling.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	RC – Reverse circulation drilling was carried out using a face sampling hammer and a 130mm diameter bit Previous operators surface diamond drilling carried out by using both HQ2 or HQ3 or PQ2 (triple tube) and NQ2 (standard tube) techniques. Sampled sections are generally NQ2. Core is routinely orientated using the ORI-shot device.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC – Approximate recoveries are sometimes recorded as percentage ranges based on a visual and weight estimate of the sample. DD – Recoveries are recorded as a percentage calculated from measured core verses drilled intervals.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Diamond drilling practice results in high core recovery due to the competent nature of the ground. RC and diamond drilling by previous operators are to industry standard at that time.
	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.	There is no known relationship between sample recovery and grade, diamond drill sample recovery is very high.
Logging	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.	Core and chip samples have been logged by qualified Geologist to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. Percussion holes logging were carried out on a metre by metre basis and at the time of drilling. Surface core and RC logging completed by previous operators assumed to be to industry standard.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is Qualitative and Quantitative and all core is photographed wet (some older core is pre-digital, photos not all reviewed). Visual estimates of sulphide, quartz and alteration as percentages.
	The total length and percentage of the relevant intersections logged.	100% of the drill core is logged. 100% of RC drilling is logged.

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	DD - Resource Definition Drilling uses NQ2: Core is half cut with an Almonté diamond core saw. Sample intervals are defined by a qualified geologist to honour geological boundaries. The left half is archived - Grade Control Drilling uses BQ: Whole core sampling is undertaken. Sample intervals are defined by a qualified geologist to honour geological boundaries. All mineralised zones are sampled, plus associated visibly barren material in contact with mineralised zones . Core is sampled on the width of the geological/mineralized structure in recognized ore zones. The minimum sample length is 0.3m while the maximum is 1.2m. Total weight of each sample generally does not exceed 5kg. For pre-Northern Star Resources (NSR) and current operator's samples, best practice is assumed.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	RC – Cyclone mounted riffle splitter or inverted cone splitter. Pre NSR RC sub sampling assumed to be at industry standard at that time.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Following drying at 100°C to constant mass, all samples below approximately 4kg are totally pulverised in LM5's to nominally 90% passing a 75µm screen. The very few samples generated above 4kg are crushed to <6mm and riffle split first prior to pulverisation. In 2012, Francois-Bongarcon (Agoratek International) conducted a heterogeneity studies, audit of site laboratory, and audit of plant samplers. Confirmed that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results. For RC samples, all drying at 100°C to constant mass, all samples below approximately 4kg are totally pulverised in LM5's to nominally 85% passing a 75µm screen. The very few samples generated above 4kg are crushed to <6mm and riffle split first prior to pulverisation. For RC samples, no formal heterogeneity study has been carried out or monographed. An informal analysis suggests that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results. For pre- NSR samples, best practice is assumed.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Repeat analysis of pulp samples (for all sample types – diamond, RC, rock and soil) occurs at an incidence of 1 in 20 samples. RC drilling by previous operators to industry standard at that time.
	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.	Field duplicates, i.e. other half of cut core, have not been routinely assayed. RC drilling by previous operators assumed to be to industry standard at that time.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	For all drill core samples, gold concentration is determined by fire assay using the lead collection technique with a 30-gram sample charge weight. An AAS finish is used to be considered as total gold. RC drilling by previous operators to industry standard at the time and not reviewed for this Resource.
	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.	Not applicable to this report.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	The QAQC protocols used include the following for all drill samples: ▪ The field QAQC protocols used include the following for all drill samples: -Commercially prepared certified reference materials (CRM) are inserted at an incidence of 1 in 30 samples. The CRM used is not identifiable to the laboratory, -QAQC data is assessed on import to the database and reported monthly, quarterly and yearly. ▪ The laboratory QAQC protocols used include the following for all drill samples: -Repeat analysis of pulp samples occurs at an incidence of 1 in 20 samples, -Screen tests (percentage of pulverised sample passing a 75µm mesh) are undertaken on 1 in 40 samples,

Criteria	JORC Code explanation	Commentary
		-The laboratories' own standards are loaded into the database, -The laboratory reports its own QAQC data on a monthly basis. -In addition to the above, ~ 3% of samples are sent to a check laboratory. Samples for check -assay are selected automatically from holes, based on the following criteria: grade above 1gpt or logged as a mineralized zone or is followed by feldspar flush or blank. ▪ Failed standards are generally followed up by re-assaying a second 30g pulp sample of samples between the failed standard and the next sequenced standard by the same method at the primary laboratory. Re-assays are dependent on grade above 0.1ppm Both the accuracy component (CRM's and third party checks) and the precision component (duplicates and repeats) of the QAQC protocols are thought to demonstrate acceptable levels of accuracy and precision. QAQC protocols for Surface RC and diamond drilling by some previous operators is assumed to be industry standard.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections not verified.
	The use of twinned holes.	There are no purpose drilled twinned holes.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Primary Data imported into SQL database using semi-automated or automated data entry. Hard copies of NSR and previous operators, core assays and surveys are stored at site. Visual checks are part of daily use of the data in Vulcan. Data from previous operators thoroughly vetted and imported to SQL database.
	Discuss any adjustment to assay data.	The first gold assay is almost always utilised for any Resource estimation. Exceptions occur when evidence from re-assaying and/or check-assaying dictates. A systematic procedure utilizing several re-assays and/or check assays is in place to determine when the final assay is changed from the first gold assay. Some minor adjustments have been made to overlapping data.
Location of data points	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.	Collar positions are recorded using conventional survey methods based on Leica TS15 3" total stations and Trimble R10 GNSS instruments. The location of each station is referenced to state-wide network of Standard Survey Marks (SSM) established and coordinated by the Department of Land Administration (WA Government). Where regional drill hole positions are distant from the SSM network the world wide Global Navigational Satellite System (GNSS) network is used. Positional checks are carried out using a combination of existing known positions (usually based on prominent landmarks) and grid referenced information such as ortholinear rectified photogrammetry based on the Australian Map Grid 1984 (AMG84_51). Collar coordinates are recorded in AMG84 or Local Jundee Grid (JUNL2) dependant on the location and orientation of ore-bodies. Cross checks were made on the survey control points and data in June 2005. Collar information is stored in both local coordinates and AMG84 coordinate in the drilling database. In-mine drill-hole collars are normally accurate to 10 cm. Multi shot cameras and gyro units were used for down-hole survey. Previous drilling have been set-out and picked up in both national and local grids using a combination of GPS and Survey instruments, and are assumed to be to industry standards.
	Specification of the grid system used.	Collar coordinates are recorded in AMG84 Zone 51 (AMG GN) and Local Jundee Grid (JUNL2) dependant on the location and orientation of ore-bodies. The difference between Jundee mine grid (GN) and magnetic north (MN) as at 31 December 2011 is 39° 35' 00" and the difference between magnetic north (MN) and true north (TN) is 1° 34' 30". The difference between true north (TN) and AMG84 Zone 51 (AMG GN) is 1° 02' 47". The difference between true north and GDA is zero.
	Quality and adequacy of topographic control.	Topographic control is from Digital Elevation Contours (DEM) 2010, 1m contour data and site surveyed pit pickups.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	All Reserves are based on a maximum drill hole spacing of 40m x 40m and all Resources are based on a maximum of 80m x 80m.

Criteria	JORC Code explanation	Commentary
	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.	Reserves are generally based on 20m x 20m drilling up to a maximum of 40m x 40m. Resources are generally based on 40m x 40m drilling up to a maximum of 80m x 80m. The data spacing and distribution is sufficient to establish geological and/or grade continuity appropriate for the Mineral Resource and classifications to be applied.
	Whether sample compositing has been applied.	Core is sampled to geology; sample compositing is not applied until the estimation stage. RC samples initially taken as 4m composites to be replaced by 1 m samples if any 4m composite values returned a gold value > 0.1ppm or intervals containing alteration/mineralisation failed to return a significant 4m composite assay result. No RC samples greater than 1m were used in estimation.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The orientation of sampling is generally perpendicular to the main mineralisation trends. The orientation achieves unbiased sampling of all possible mineralisation and the extent to which this is known.
	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.	The drill orientation to mineralised structures biases the number of samples per drill hole. It is not thought to make a material difference in the Resource estimation. As the opportunity arises, better angled holes are infill drilled.
Sample security	The measures taken to ensure sample security.	All samples are selected, cut and bagged in tied numbered calico bags, grouped in larger tied plastic bags, and placed in large sample cages with a sample submission sheet. The cages are either sent to the site laboratory or are transported via freight truck to Perth, with consignment note and receipted by external and independent laboratory. All sample submissions are documented and all assays are returned via email. Sample pulp splits from the site lab are stored at the Jundee mine site and those from the Newburn Lab in Perth are stored at the Newburn Lab. Pre NSR operator sample security assumed to be similar and adequate.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	In 2006, Maxwell conducted an audit of all Jundee data. In 2012, Francois-Bongarcon (Agoratek International) conducted a heterogeneity studies, audit of site laboratory, and audit of plant samplers. Both audits found the sampling techniques and data to be adequate. All recent NSR sample data has been extensively QAQC reviewed both internally and externally. Pre NSR data audits found to be minimal in regard to QAQC though in line with industry standards of the time.

Section 2 Reporting of Exploration Results

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

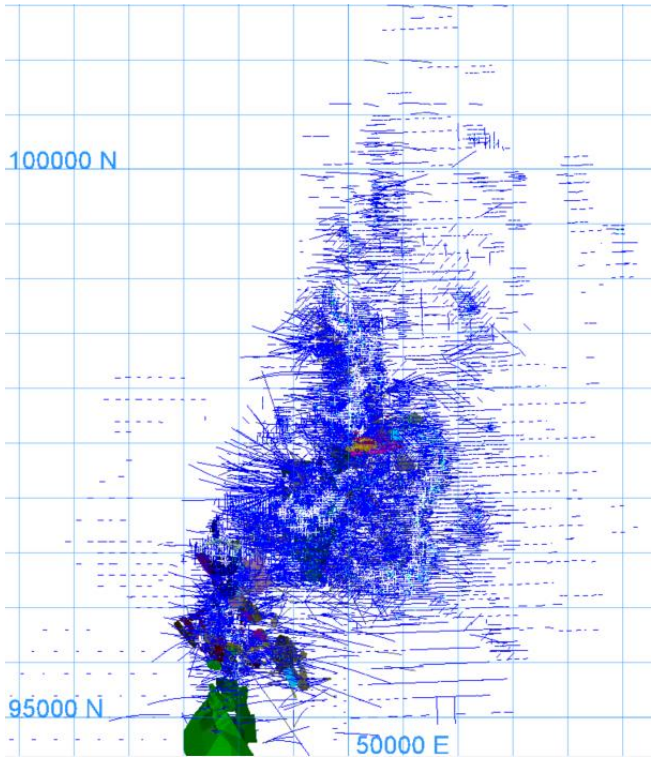
Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.	The Jundee project consists of tenements comprising 62 mining leases and 1 general purpose lease, covering a total area of approximately 57,422.2 Ha. All are registered in the name of Northern Star Resources Limited. The project also includes 23 miscellaneous licences, 3 groundwater licenses, a pipeline license, and the Jundee Pastoral Lease. These cover the bore fields, roads, airstrip, and gas pipeline. There are numerous access agreements in place including access rights over part of Mark Creasy's mining lease 53/193 which lies contiguous to and beneath the general purpose lease on which the Jundee gold mine processing plant is located. There are no heritage issues with the current operation. The majority of the Jundee leases are granted Mining Leases prior to 1994 (pre Mabo) and as such Native Title negotiations are not required. During 2004, two agreements where struck between Ngaanyatjarra Council (now Central Desert native Title Services (CDNTS)) and NYO, these agreements being the Wiluna Land Access Agreement 2004 and the Wiluna Claim Heritage Agreement 2004.
	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.	All leases and licences to operate are granted and in the order for between 3 and 20 years.

Criteria	JORC Code explanation	Commentary
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Data relevant to this Resource was predominantly NSR (Northern Star Resources), who have operated the mine since July 1, 2014. The Jundee/Nimary Deposits were discovered in the late 1980's/early 1990's after LAG and soil sampling by Mark Creasy (Jundee) and Hunter Resources (Nimary) identified large surface gold anomalies. The deposits were drilled out over the following years by Eagle Mining (which took over Hunter Resources), and Great Central Mines (which formed a joint venture with Creasy and later purchased his share). Open pit operations commenced in mid-1995, with the first gold poured in December 1995. Great Central Mines assumed full control of the field with its successful takeover of Eagle Mining in mid-1997. Great Central Mines was later taken over by Normandy in mid-2000, which in turn was taken over by Newmont in early-2002. All previous work is accepted and assumed to industry standard at that time.
Geology	Deposit type, geological setting and style of mineralisation.	Jundee is an Archean lode-gold mineralized deposit that is part of the Northern Yandal Greenstone belt. Gold mineralisation is controlled by a brittle fracture-system, is commonly fracture-centred, and is predominantly hosted in dolerite and basalt. Mineralisation can be disseminated or vein style host.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically summarise all drill information used. (See diagram).
	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.	Exclusion of the drill information will not detract from the understanding of the report. Holes are close spaced and tightly constrained to an active mine area.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Reported exploration results are uncut.
	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.	Short intervals are length weighted to create the final intersections.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Due to complex mineralisation geometry and varying intercept angles the true thickness is manually estimated on a hole by hole basis.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Downhole length in addition to estimated true width is shown in the report tables.
Diagrams	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.	Plan view and long section view of Jundee showing drill collars is attached.
Balanced reporting	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.	The results released are considered representative of the results received to date.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density,	No other meaningful data to report.

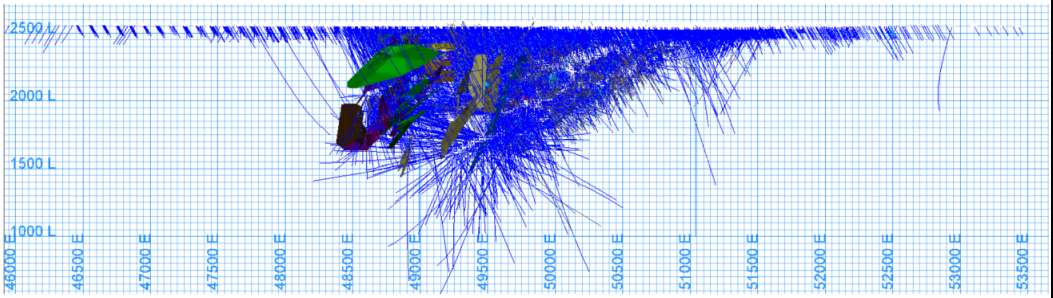
Criteria	JORC Code explanation	Commentary
	groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further extensional and definition drilling is planned for FY2018 from both underground and surface positions.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Representative diagrams are attached with this report.

JUNDEE UNDERGROUND - REPRESENTATIVE PLAN & LONG SECTION

Plan View - Jundee deposits with drill hole traces.

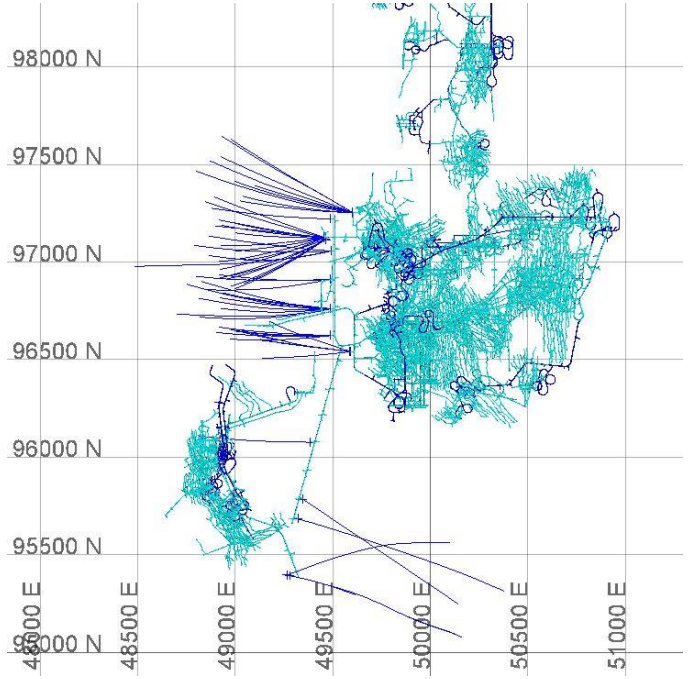


Long Section View - Jundee deposits with drill hole traces. Wireframes denote major mineralised structures.

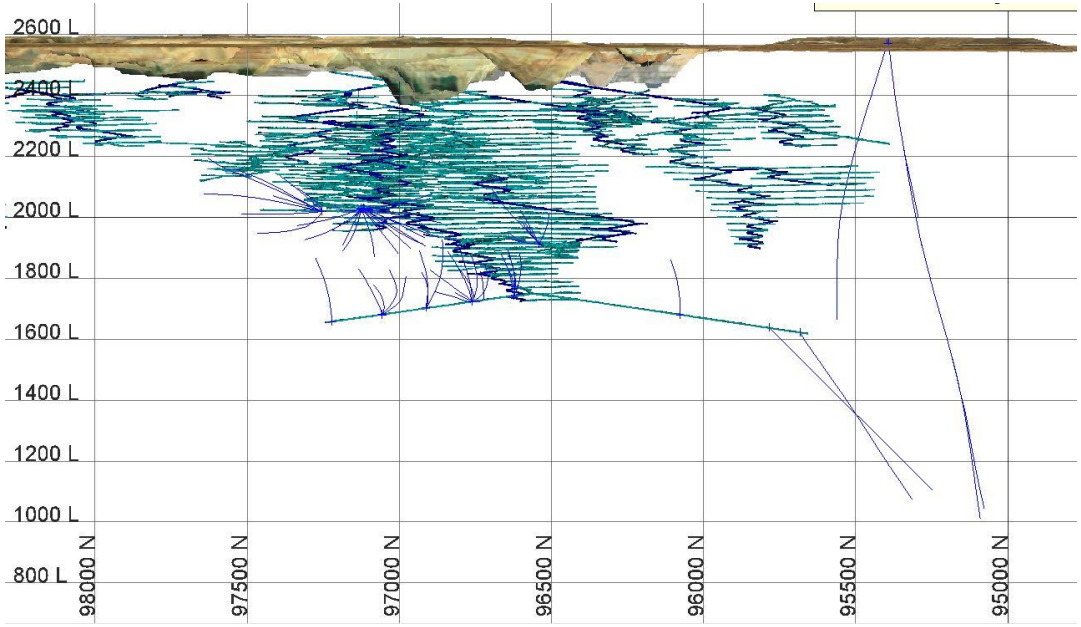


JUNDEE EXPLORATION RESULTS – PLAN & LONG SECTION

Plan View – Exploration holes referenced in this release.



Long Section View – Exploration holes referenced in this release.



Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	NSR (Northern star Resources) sampling and logging data is digitally entered into a tablet then transferred to an SQL based database. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly to the database from lab, logging and survey derived files. Pre NSR data considered correct.
	Data validation procedures used.	Pre NSR data has been partially validated by internal database administrators.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person for this Resource report has worked on site for extensive periods between 2005 and 2010.
	If no site visits have been undertaken indicate why this is the case.	Site visits have been undertaken.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource using Vulcan software. The confidence in the geological interpretation is relatively high, though a certain degree of uncertainly always remains due to the structurally complex and nuggetty nature of the orebody on a local scale. The confidence is supported by all the information and 21 years of open pit and underground operations.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drilling, oxidation surfaces, and underground style high grade ore zone interpretations.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed or put forward.
	The use of geology in guiding and controlling Mineral Resource estimation.	Drill core logging, pit mapping, and underground mapping used to create 3D constrained wireframes.
	The factors affecting continuity both of grade and geology.	Continuity of the grade varies significantly, though lodes with the greatest continuity are generally sub-parallel to the dolerite and basalt packages in which they are hosted. Splays or link lodes coming off of this main trend tend to have a shorter continuity.
Dimensions	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.	Mineralized zones are narrow, with true width ranging from 0.3 to 1m, but can be up to 5m. They are extensive along strike and down dip, up to 1000m and 500m, respectively, but are often highly discontinuous, and generally have a tabular geometry. Depth = surface to ~1710mRl (~845m below surface).
Estimation and modelling techniques	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.	Domains are set by grouping lodes as dictated by their structural setting, geological mineralisation and statistical characteristics. The raw data is subdivided into domains based on geological controls and further analysed for correlation and similarity using statistics. The purpose of this analysis is to determine further domaining of the data for variography purposes (by combining groups of lodes). Seam compositing (from hanging wall to footwall) of drill-hole samples is almost exclusively used. A very small proportion of UG lodes, which exhibit a wider disseminated style of mineralisation, use a nominal 1 meter downhole composite. Detailed exploratory data analysis is carried out on each deposit, using Snowden Supervisor software. The majority of the Resource is estimated using ordinary kriging (OK) and multiple indicator kriging (MIK). A minor proportion of the Resource is estimated using inverse distance squared (ID2). The estimation type used is dictated by the dataset size of the domain. Vulcan software was used for data compilation, domain wireframing, calculating and coding composite values, estimating and reporting. Maximum distance of extrapolation from data points was statistically determined and varies by domain. Block model volumes were compared to wireframe volumes to validate sub-blocking. Where OK or ID2 estimates were used, treatment of extreme high grades were dealt with by using a cap grade strategy.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Reconciled historical production from underground operations is comparable with new estimate.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.

Criteria	JORC Code explanation	Commentary
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The majority of underground models use a seam modelling methodology where the parent block size is 2.5m in strike, 1m in RL, and a variable width constrained by the width of the vein in the across strike direction. Sub-block sizes are 2.5m in strike, 1m in RL, and 0.2m across strike direction The use of seam models is more amenable for narrow vein mineralisation and gives greater flexibility in manipulating models for mining dilution. Reserves are generally based on 20m x 20m drilling up to a maximum of 40m x 40m. Resources are generally based on 40m x 40m drilling up to a maximum of 80m x 80m.
	Any assumptions behind modelling of selective mining units.	A 1.5m minimum mining width for underground environment is assumed.
	Any assumptions about correlation between variables.	There is no correlation between variables.
	Description of how the geological interpretation was used to control the Resource estimates.	"Mineralised" wireframes are created within the geological shapes based on drill core logs, mapping and grade. Low grades can form part of an ore wireframe. Estimations are constrained by the interpretations.
	Discussion of basis for using or not using grade cutting or capping.	Top cuts were applied in the Estimation stage and determined by a range of statistical techniques including: • Disintegration analysis of Histogram, Log-probability and Mean- CV plots • Contained metal plots: assessment of contribution of the highest values on the quantity of metal in an estimate • Outlier analysis; removal of outliers and analysis of impact on the CV of domain • Interrogation of Disintegration points of seam composites A range of top cuts were selected for each domain utilising the above strategies and an appropriate top cut chosen after further sensitivity analysis against Nearest neighbour estimations to assess sensitivity of selected top cut grades and associated risk. Metal estimated in the Resource models are finally reconciled with production models of like areas to determine the appropriateness of the high grade treatment on the assays. No top cutting or capping of high grades is done at the raw sample or compositing stage. For OK and ID2, treatment of the high grade assays occurs at the estimation stage. In MIK estimation this occurs in the form of the grade assigned to the highest indicator bin. Top cuts vary by domain and range from 20gpt – 2,000gpt.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	The Mineral Resource estimate was validated using processes that are based on a combination of visual, graphical and reconciliation style validations summarised as: - Visual validation of the lode and lithology coding of both the composite data and the block model. - Comparison of lode wireframe volumes to block model volumes - Visual validation of Mineral Resource estimate against composite data in plan, section, and in 3D. - Sensitivity to top-cut values: a variety of top-cuts are estimated and compared to themselves and to the un-cut nearest neighbour estimate at a variety of cut-offs. - Kriging efficiency and slope of regression interrogated for each material domain. - Comparison of nearest neighbour, inverse distance squared, and ordinary kriged estimates to the final estimate (generally OK or MIK). These comparisons are conducted through visual validation and trend analysis along Northing, Easting, and RL slices. - Comparison with previous Mineral Resource estimates. Global, level and lode tonnages and grades, at various elemental cut-offs were compared, and, given the changes in support data, were considered to be consistent; - Comparison of Mineral Resource estimate versus grade control models. Local underground GC models are produced using, in addition to the diamond drill holes used in the Mineral Resource estimate, face chip and drive mapping data. These comparisons are done on a level basis at various cut-offs. - Statistical comparison of composites versus all estimates in block model: trend analysis plots for each domain are produced by Northing / Easting / RL. The Mineral Resource estimate generally shows a reasonably reflection of the composites where there are high numbers of composites used in the estimate. When the numbers of samples reduce the accuracy of the estimation suffers and a more significant deviation is noted between the Mineral Resource estimate and associated composite data. These deviations are taken into account when

Criteria	JORC Code explanation	Commentary
		assigning a Resource classification.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis. Moisture content within the ore is expected to be low.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Underground Resources have been reported through MSO generation using a minimum mining width of 1.5m coupled with cut-off grades calculated on a variable cost basis and an Au $1,750 gold price.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	Underground Resources are reported using a minimum mining width of 1.5m inclusive of 0.5m internal dilution on both the Hangingwall and footwall.
Metallurgical factors or assumptions	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.	Assumed that material will be trucked and processed in the Jundee Mill. Recovery factors vary for the various mining areas and are based on lab testing and on-going operational experience. No Metallurgical assumptions have been built or applied to the Resource model.
Environmental factors or assumptions	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 green fields 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.	Jundee currently possesses all necessary government permits, licenses and statutory approvals in order to be compliant with all legal and regulatory requirements.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density values used were based on an updated study of the average lithological densities across the mine site completed in 2013. This study consisted of a detailed statistical analysis of 72,634 measurements that have been recorded from all underground deposits. These values are also in agreement with over 10 years of production data.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	Bulk density measurements are taken daily using the water displacement technique. One bulk density measurement is taken for each lithology in every hole every day. An attempt is made to collect a bulk density measurement from every mineralized zone and each lithology represented in drill hole core. A total of 77,500 bulk density measurements have been taken.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Individual bulk densities are applied in accordance with specific lithologies, mineralisation, and weathering states.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Measured Resources are defined from grade control models based on geological mapping and surveyed ore outlines in development drives, diamond drill holes and face samples which are imported into Vulcan and modelled in 3D. Indicated Resources are defined by drilling which is generally 20m x 20m and may range up to 40m x 40m maximum. Lodes classified as Indicated are supported by a minimum of 5 face chip or Diamond drill holes. Inferred Resources are defined on a nominal 40m x 40m drilling pattern and may range up to 80m x 80m. Resources based on less than 40m x 40m spaced drilling, but which have a low level of confidence in the geological interpretation may also be classified as inferred.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Input and geological data is assumed accurate backed up by previous successful mining history at the site on this mineralisation.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This mineral Resource estimate is considered representative with comments noted in the discussion below.

Criteria	JORC Code explanation	Commentary
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The Mineral Resource estimates, methodology and systems have been subject to one external review through NSR and four internal audits by previous operators and senior technical personnel over the last 10 years.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This mineral Resource estimate is considered as robust and representative of the Jundee mineralisation with local estimates considered variable in nature. The application of geostatistical methods has supported to increase the confidence of the model and quantify the relative accuracy of the Resource on a global scale and against actual production reconciliation.
	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.	This Resource report relates to the Jundee deposit and is likely to have local variability. The global assessment is a better reflection of the average tonnes and grade estimate, further supported and reconciled against actual mine production.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Comparison with previous Mineral Resource estimates and production data was undertaken. Global, level and lode tonnages and grades, at various elemental cut-offs were compared, and, given the changes in support data, were considered to be consistent.

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Reported ore Reserve based on Resource and Grade Control models.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	Mineral Resources are reported inclusive of the Ore Reserves.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Numerous and frequent Site Visits have been undertaken by the competent person and in addition actual design and evaluation work was conducted at Jundee site. Familiarity with the mine site and historical performance was considered in providing the Reserve Estimate.
	If no site visits have been undertaken indicate why this is the case.	Site Visits were undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	Detailed mine design and costing based upon ongoing mine performance. The 2017 Reserves also contain a new mining method utilising paste fill to enable access into old mining area. The current study level is consummate with a pre-feasibility study.
	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.	This is a current and operating mine. As such, for the majority of the Reserve material, current operating design parameters and costs have been used in the generation of these Reserves. The Reserves associated with paste filling are at a pre-feasibility level, with a practical mine plan and economic assessment underpinning their Reserve status.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	A cut-off grade is generated, and all potential Reserve material is evaluated, based on the direct costs of all tasks involved and corporate gold price guidance. Historic actual costs are relied upon heavily in determining cut-off grades and costs.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Stope shapes are created manually on all Resource material, using a minimum stope mining width of 2.2m. Access designs are created to allowed detailed economic evaluation. Measured Resource material is converted to Proved and Probable Reserve, and Indicated Resource is converted to Probable Reserve.
	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.	Deemed appropriate due to ongoing successful implementation of design assumptions in the current mining operation. The areas assessed using paste fill have utilised the site void model, and taken extraction methodologies from existing operations utilising paste fill. Detailed tailing characterisation studies have been conducted to allow paste plant selection, and application of appropriate capital and operating costs.

Criteria	JORC Code explanation	Commentary
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	2.2m minimum mining width (stopes) and 85% stope mining recovery to account for internal pillars, in line with historical performance. A new mining area, Armada, was geotechnically assessed separately and found to be consistent with historical geotechnical mining parameters.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	2.2m minimum mining width for stopes. Detailed designs available for each stope. Historical mining costs applied for economic evaluation.
	The mining dilution factors used.	A 15% tonne dilution factor was used for development, whilst 5% was applied for stopes. These values are based on historical mine reconciliation records. For the paste fill assessment areas, a variable dilution factor was applied between 0-15% based on the ore blocks location in comparison to the fill surface.
	The mining recovery factors used.	85% where stope pillars have not been incorporated into the design and 100% for detailed design where pillars have been considered. For the paste filled areas, a variable recovery of between 70%-100% was applied based on the ore blocks location in comparison to the fill (next to, encompassed within, or located on top of).
	Any minimum mining widths used.	The minimum mining width for stopes is 2.2m.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Inferred material is included within the mine plan, however material is only classified as Reserve when the measured and indicated material can cover all costs associated with the mining of that material. Designed stopes with greater than 50% inferred blocks are excluded from the reported Reserve.
	The infrastructure requirements of the selected mining methods.	Infrastructure in place, currently an operating mine. This includes underground capital development, accommodation village, workshop, office, water bores, ROM pad, processing facility, and communication networks. Additional infrastructure would be required for the paste filled areas, comprising a paste plant, surface and underground reticulation and this has been designed and costed to Pre-feasibility level.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	Material will be trucked and processed in the existing Jundee Mill which is a standard CIP plant with gravity circuit, operating since 1995.
	Whether the metallurgical process is well-tested technology or novel in nature.	Well tested technology.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Recovery factors vary for the various mining areas and are based on lab testing and on-going operational experience. Recoveries range from 78% up to 95% with an average 92.5% on blended feed. Historical processing supports this.
	Any assumptions or allowances made for deleterious elements.	No allowances made and considered immaterial to the mineralisation reported.
	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.	All mineralisation systems have significant bulk drill core test work undertaken prior to mining and current Resource/Reserves have a history of operational experience.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	Jundee is an ongoing operation, currently compliant with all legal and regulatory requirements. All government permits and licenses and statutory approvals are either granted or in the process of being granted.
Infrastructure	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.	As the Jundee mine has been operating for several years, all required surface and underground access infrastructure is already in place to facilitate mining and processing. A paste fill plant and associated reticulation would be required for the paste fill ore zones.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	All capital costs have been estimated based upon projected requirements and experience of costs incurred through similar activities in the past.
	The methodology used to estimate operating costs.	The operating cost estimates are based upon historical costs incurred. Paste fill costs were determined through benchmarking costs at other paste fill sites, in conjunction with consultant recommended rates.

Criteria	JORC Code explanation	Commentary
	Allowances made for the content of deleterious elements.	No allowance made - none expected.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Revenue was based on a gold price AUD $1,500/ozs.
	The source of exchange rates used in the study.	Corporate guidance.
	Derivation of transportation charges.	Mining and Haulage costs are based on historical costs incurred in the previous cost periods.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Processing costs are based on historical processing data from the plant at Jundee.
	The allowances made for royalties payable, both Government and private.	WA State Govt royalty of 2.5%.
Revenue factors	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.	Revenue was based on a gold price of AUD $1,500/oz.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	It is assumed all gold is sold directly to market at the Corporate gold price guidance of AUD $1,500/oz.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not Applicable.
	Price and volume forecasts and the basis for these forecasts.	Corporate Guidance.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not Applicable.
Economic	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.	All costs assumptions are made based on historical performance from the plant and quotes from experienced mining contractor. The economic forecast is representative of the current market condition. Paste fill costs were sourced from other paste fill sites and consultant recommendations.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	The revised business plan, based on the updated Reserves is still in progress, regarding NPV ranges. Jundee Reserves are relatively insensitive to gold price fluctuations due to the higher-grade nature of the mineralised systems.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders including traditional land owner claimants.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	
	Any identified material naturally occurring risks.	None.
	The status of material legal agreements and marketing arrangements.	None.
	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.	Jundee is a currently operating mine site with all government and third party approvals in place for the stated Reserves.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	Reserve classifications are derived from the underlying Resource model, with Measure Resource converting to Proved and / or Probable Reserve, and Indicated Resource converting to Probable Reserve where applicable and economically justified.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.

Criteria	JORC Code explanation	Commentary
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	Negligible.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	There have been no external reviews of this Ore Reserve estimate. The Ore Reserve has been prepared and peer reviewed internally within Northern Star Resources.
Discussion of relative accuracy/ confidence	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.	Confidence in the Reserve is high based on current mine and reconciliation performance.
	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.	The Reserves are best reflected as Global estimates.
	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.	As an operating mine confidence in modifying factors is high.
	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.	Reconciliation results from past mining at Jundee has been considered and factored into the Reserve assumptions where appropriate.

JORC Code, 2012 Edition – Table 1
Kanowna Surface (Woodline – Fenceline) – 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Reverse circulation drilling was used to obtain 1m samples from which 2kg (Delta Gold holes) or 3kg (Barrick/NSR holes) was pulverised to produce a 50g charge for fire assay. For the Delta Gold holes, less prospective zones or wet zones were sampled with five metre composites that were assayed with aqua-regia digest and AAS finish on a 50g charge. All composite intervals returning greater than 0.01gpt Au were subsequently re-sampled from one metre intervals retained in plastic bags, dried, riffle split, and then treated as above. Diamond drill core was half-core sampled on a nominal 1m sample length and was pulverised to produce a 50g charge for fire assay. For the Delta gold holes, less prospective zones sampled by V-cut in 4m intervals and then treated as above. Any significant anomalous composite intervals were re-sampled by taking all core from the remaining hemisphere of the V-cut as 1m samples and then treated as above.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Sample intervals are marked on the core by a geologist typically every 1m to honour geological boundaries. Sample interval lengths vary from 0.3m and 1.2m (NQ). The same half of the core was selected for each sample interval, placed in numbered calico bags and submitted to the laboratory for analysis. The other half of the core was left in the core tray which was stamped for identification, stored and catalogued.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Assaying is by fire assay with a 40 or 50g charge and AAS analysis for gold. All sampling data is entered onto logging sheets or tablet computer and entered into the central Acquire database.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Most drill holes are 130-145mm reverse circulation, but supplemented with a small proportion NQ diamond drill holes. The diamond drill holes were of NQ or NQ2 diameter in fresh rock; however, some HQ3 triple tube drilling was used through the regolith, which includes the main mineralised zones.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Diamond drilling recoveries were accounted for by recording core loss intervals measured in linear downhole metres to the nearest five centimetres. All diamond core was dried before sample preparation making the original moisture of the sample irrelevant to sample and assay integrity. For Barrick / NSR RC drill holes: RC drill recoveries were logged by the geologist or field assistant whilst drilling. These recoveries were based on a visual estimation of the proportion of sample returned relative to a full one metre sample. Moisture was logged as wet, moist or dry where wet means all or part of the sample was a slurry, moist means the material was wet enough to clump together and therefore not split effectively through a riffle or cone splitter and dry was any sample that was sufficiently free of moisture to properly run through a riffle or cone splitter. For Delta Gold RC drill holes: Drilling reports show that moisture and recovery for RC drill holes was noted through the drilling campaign and sampling techniques modified accordingly, however this information is not contained within the Northern Star drill database so no analysis of this data is possible.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Where recovery data is available, that data shows that 96% of samples have sufficient recovery to be considered a representative sample. Most of those poor recoveries are from the first two metres of the hole where the resultant gold grades will have little or no impact on the estimated grades.
	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.	Where moisture data is available, that data shows that 4% of samples were wet and therefore may not be representative. A negligible proportion of samples were moist (samples where there may be a small effect on the reliability of the gold grade of the sample). This analysis shows that there not a relationship between moisture and gold grade that would compromise the integrity of the estimate.

Criteria	JORC Code explanation	Commentary
		Although the moisture data has been lost for the Delta Gold holes, the sampling protocol of drying and resampling wet zones that passed the 0.01gpt Au threshold means that any wet samples from these holes will not have had a material effect on the estimate. There is no known relationship between recovery and grade.
Logging	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.	All DD core was logged by geologists with lithology, mineralisation, structure, alteration, veining and regolith were recorded. Quantitative measures such as structural measurements, intensity of alteration, percentage of mineralisation, thickness of veins and veins per metre were also recorded. Geotechnical measurements on DD core include RQD, Recovery, and Fracture Frequency. Photographs are taken of each core tray when wet. All mineralised intersections are logged and sampled. All core and chips have been logged to the detailed exploration logging scheme of Delta Gold/Barrick/Northern Star (i.e. a single logging scheme that has evolved with only minor changes over time). Selected diamond core has been geotechnically logged as required.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is qualitative and all core is photographed and half core retained in archive. Visual estimates are made for mineralisation percentages for core.
	The total length and percentage of the relevant intersections logged.	100% of the drill core and RC chips are logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	All diamond drill core was sawn longitudinally and one half submitted to the laboratory. DD core is sampled by sawn half-core on intervals controlled by geological domaining represented by mineralisation, alteration and lithology. A selected number of grade control holes were full cored. Mineralised intersections are sampled with a maximum and minimum length of 1.2m and 0.2m, respecting lithological or alteration contacts. The down hole depth of all sample interval extents are recorded.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC drill samples were either cone or riffle split on the drill rig and that sample was then submitted to the laboratory.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	For Barrick / NSR drill holes: Sub sampling:. Laboratory Sample Preparation - DD: Drill core samples submitted to the laboratory are crushed to a nominal 6mm in a jaw crusher (no grind checks used for this step) and then pulverised to 90% passing 75µm in an LM5 puck mill. Samples too large (>3kg) for the LM5 mill are first crushed in a Boyd crusher to 90% passing 3mm and the sub-sampled to less than 3kg with a rotary splitter. Laboratory Sample Preparation - RC: Samples are pulverised to 90% passing 75µm in an LM5 puck mill. Samples too large (>3kg) for the LM5 mill are first jaw-crushed 90% passing 3mm and then sub-sampled to less than 3kg with a rotary splitter. For the crushing and pulverising steps above grind checks are conducted on a 1 in 25 samples basis to confirm effectiveness. Field Duplicates: Field duplicates were taken on a one-in-twenty samples basis for RC drilling with a second split of the 1m sample to provide a second nominally 3kg sample to be processed identically to all original samples. Diamond core did not have duplicate samples taken. Laboratory Splits: A second pulp 250-300g was taken from the LM5 mill on a 1 in 50 samples basis and processed identically to other samples for the remainder of the assay workflow. The specific details of the sub-sampling techniques and sample preparation for the Delta Gold holes is not well documented, but is believed to be somewhat similar to the methods described above.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Most holes have all intervals sampled. Approximately 80% of the latest round of RC drilling (WDRC17***) were not sampled over the top 30m, as that has previously shown to be barren.
	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.	Quarter core sampling is often undertaken as a check.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Grind checks are performed at both the crushing stage (3mm) and pulverising stage (75µm) requiring 90% of material to pass through the relevant size.

Criteria	JORC Code explanation	Commentary
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	All one metre samples were assayed with a fifty gram charge weight with an AAS (atomic absorption spectroscopy) finish. This method is considered to report the total gold content of the sample. Delta Gold composite samples were assayed with aqua-regia digest and AAS finish on a 50g charge. Laboratory Checks: The laboratories used were required to routinely repeat a fire assay from the pulp for 1 in 20 samples. Laboratory Repeats: Higher grade samples (above a nominal 1 gpt cut-off) were re-assayed from the original pulp until the result was deemed repeatable, by the laboratory. Delta Gold reports document the use of company supplied standard material and that the results were acceptable, being within 10% of the accepted value, but the exact details of the protocol(s) are not described and the QA data is not available.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Sampling and assaying QAQC procedures include: - Periodical resubmission of samples to primary and secondary laboratories (minimum >5%). - Submittal of independent certified reference material - Sieve testing to check grind size - Sample recovery checks. - Unannounced laboratory inspections For Barrick / NSR drill holes, commercially produced, certified standards were submitted to the laboratory on a 1 in 20 basis. Ground Bunbury Basalt (similar in appearance to an RC sample from mafic rocks), of a gold concentration known to be below normal ppm detection limits (but not certified), was submitted in the sample stream on a 1 in 50 basis to be processed identically to all original samples. Primary laboratory Bureau Veritas meets ISO 9001:2000. MinAnalytical labs are NATA accredited for compliance with ISO/IEC17025:2005
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	The significant intercepts of the Woodline area are considered to be verified on the basis that the project has been drilled with different methods by different teams from two different parent companies over twenty years and has returned results that are consistent with each other and demonstrate continuity of grade and thickness of mineralisation. All recent assay data (definitely all Barrick/NSR assay data and probably much of the Delta Gold data), has been directly imported into the digital database directly from laboratory reports, eliminating any potential for typographical errors.
	The use of twinned holes.	Five RC holes were drilled in 2017 attempting to replicate the long high grade intercepts in earlier RAB drilling. While high grade was intercepted, the new holes did not replicate the downhole length. RAB and AC holes not used in the Resource.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All assay data adheres to Kanowna QAQC standards and is further validated by a qualified person before it can be used in the Resource estimation process. All data is stored in the site Acquire database with hard copies of all logging and sample results filed for each hole. Assay files are received in csv format and loaded directly into the database by the supervising geologist who then checks that the results have inserted correctly. Hardcopy and electronic copies of these are also kept.
	Discuss any adjustment to assay data.	Assay adjustment Stored in the NSR Acquire database are various 'priorities' of sampling. This does not reflect the quality of sample but is due to the combining of two historic databases. A series of holes has assays in both priorities with on defaulting to zero, and the other actual grades. Samples were adjusted outside of the AcQuire database to only contain real assays.

Criteria	JORC Code explanation	Commentary
Location of data points	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.	Newer drill hole collars were picked up by differential GPS in the MGA94 Zone 51 map grid. Earlier drill holes were mostly picked up by theodolite on a local exploration grid and later referenced back to the MGA94 map grid. Prior to use, all pre-2017 collars were adjusted vertically to match the 2012 Lidar surface, 2017 drilling RI's were within10 cm or the Lidar surface. All recent drill holes were surveyed downhole by various methods; including a single shot downhole camera, EMS (Electric Multi Shot) method, or in-rod gyroscopic survey tools. Holes are typically surveyed at 15m and 30m intervals down hole thereafter. Data from electronic tools was imported directly into the digital database from electronic data files to avoid typographical errors. Survey Adjustment Stored in the NSR Acquire are various types of survey azimuths. Due to the combining of two historic databases, and inconsistent conversion to MGA grid resulted in bearings that were not plausible. Some holes use "OLD BRG" some "MGA BRG", with discrepancies showing mainly in collar shot (gets adjusted depending on what grid is nominated in the collar file, but this is unreliable) Azimuths for 64 holes were adjusted outside of the AcQuire database.
	Specification of the grid system used.	MGA 94.
	Quality and adequacy of topographic control.	A digital terrain model was commissioned from Cardno-Spectrum Surveys in 2012 for the purpose of this Resource estimate.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	The drilling attained a 20m x 20m spacing on the sub-horizontal paleo channel mineralisation and the sub-vertical fresh-rock porphyry related mineralised surface.
	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.	This drill spacing is considered appropriate for an indicated Resource on the paleochannel mineralisation.
	Whether sample compositing has been applied.	Samples were composited to 1m prior to estimation.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of the drilling is oriented between 55° and 60° dip on an azimuth roughly perpendicular to the strike of the controlling porphyry dyke. This drill orientation adequately tests both the sub-horizontal paleo channel and supergene surfaces and the sub-vertical porphyry-related surfaces without introducing a sampling bias.
	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.	Holes with orientations that are considered likely to introduce sampling bias are excluded from the estimation during the validation process.
Sample security	The measures taken to ensure sample security.	All core is kept within the site perimeter fence on the Mining Lease M27/103. Samples are dispatched and/or collected by an offsite delivery service on a regular basis. Each sample batch is accompanied with a: • Job number • Number of Samples • Sample Numbers (including standards and duplicates) • Required analytical methods • A job priority rating A Chain of Custody is demonstrated by both Company and Bureau Veritas / MinAnalytical in the delivery and receipt of sample materials. Any damage to or loss of samples within each batch (e.g. total loss, spillage or obvious contamination), is reported to the Company in the form of a list of samples affected and detailing the nature of the problem(s).
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	This Resource estimate and supporting data has not been externally audited.

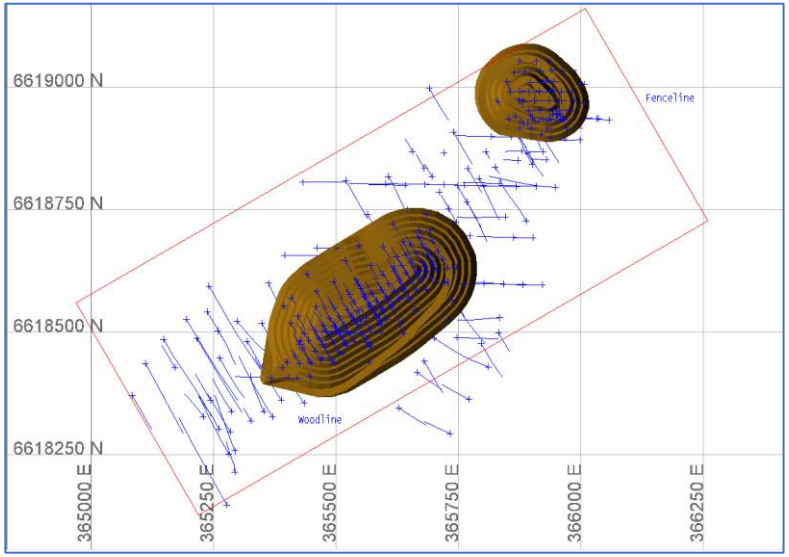
Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	The Woodline deposit is on mining Lease M27/37 which is 100% owned by Northern Star Resources and held in good standing. A gazetted, but disused, road passing through the prospect is in the process of being either closed or degazetted so that mining may proceed.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	All Resource quality drilling (RC and Diamond) on the Woodline prospect has been undertaken by the one company operating the Kanowna Belle Gold Mine, albeit with a succession of different parent companies having ownership of that operation (Delta Gold, Aurion Gold, Placer Dome, Barrick Gold and now Northern Star Resources).
Geology	Deposit type, geological setting and style of mineralisation.	The Woodline deposit encompasses two distinct mineralisation styles. The primary mineralisation is mineralisation is associated with a felsic dyke that has intruded a shear zone passing through a basalt sequence. The intrusive has elevated gold grades of the order of 0.2gpt throughout, with high grade zones on the sheared margins associated with pervasive sericite-albite alteration and fine disseminated pyrite. Syn- or post- intrusion shearing has also produced a narrow but laterally continuous quartz-ankerite-chlorite-arsenopyrite-pyrite vein with high gold grades that roughly follows the sheared intrusive margin. Supergene processes have laterally dispersed gold away from the primary source at the base of weathering to create the lowermost sub-horizontal mineralised surface. Other supergene surfaces occur at the base of channels of transported sands. Alluvial gold in the base of the channels, which are nested on top of each other, is believed to have nucleated the precipitation of supergene gold mobilised from the primary source by weathering processes.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically list, the long section and plan reflect the hole positions used for estimation stated. Full Resource report lists all holes in an appendix.
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Exploration results not being reported.
	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.	Exploration results not being reported.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values have been used for the reporting of these exploration results.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	True widths have been calculated for intersections of the known ore zones, based on existing knowledge of the nature of these structures.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Both the downhole width and true width have been clearly specified when used.

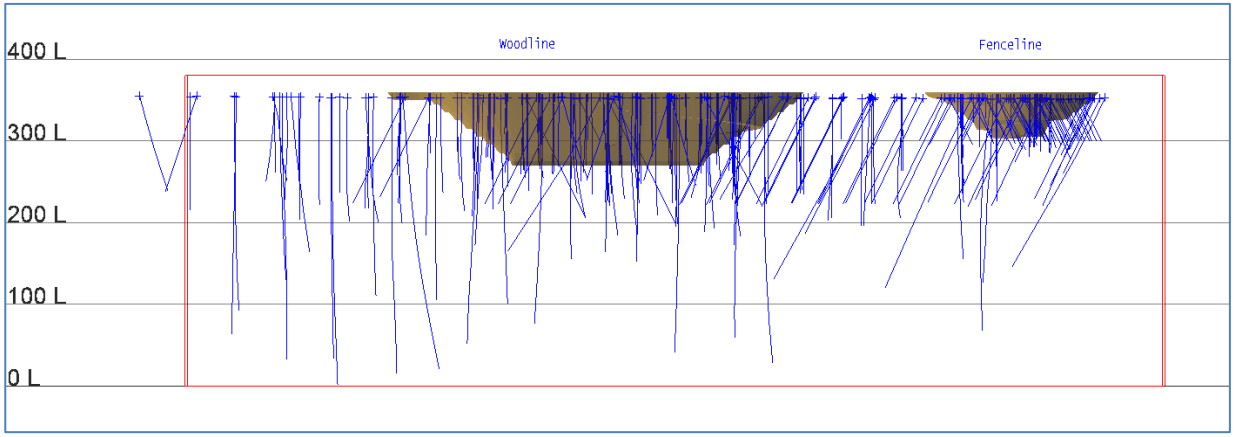
Criteria	JORC Code explanation	Commentary
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Where mineralisation orientations are known, downhole lengths are reported.
Diagrams	Appropriate 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.	Appropriate plans and section have been included in this report.
Balanced reporting	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.	Exploration results not being reported.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	A 2012 SAM (sub-audio magnetics) geophysical survey over the Woodline Prospect was targeting the larger-scale exploration potential of the area and as such is not relevant to the local scale of this Resource estimate.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further testing of the paleochannel at depth and exploring for the source. Further grade control drilling would be required prior to mining.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	

WOODLINE DEPOSIT - REPRESENTATIVE PLAN & LONG SECTION



Plan View: Woodline – Fenceline deposit with conceptual pit design shown

Long Section Through the Woodline Deposit with conceptual pit design shown



Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Wherever possible data has been taken into the digital database by directly importing it from digital files. Barrick / NSR drill holes were validated by compiling a hardcopy of all relevant data on a hole-by-hole basis with a coversheet for each. As each piece of information was checked against the information in the database the relevant section of the coversheet was signed off by the person who did that check. The position and orientation of all drill holes was checked in three-dimensions using Vulcan mining software, with the consistency of the fresh-rock geology proving useful for spatially validating the dataset The internal consistency of grade and thickness of intercepts does not indicate any material problems with the sample and assay data of older holes for which the above checks cannot be applied.
	Data validation procedures used.	Random checks through use of the data and data validation procedure prior to Resource estimation. This lead to assay, survey and collar adjustments as outlined in section 2.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The CP has visited the site and found all as expected.
	If no site visits have been undertaken indicate why this is the case.	Site visit undertaken.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	There is a high level of confidence in the interpretation of the fresh-rock and lowermost supergene mineralisation surfaces. There is good support with the increased drilling, for the interpretation of the paleochannel surface(s) from drill hole logging data and the lateral continuity of these surfaces is reasonable. The spatial interpretation of these surfaces and general geological context is supported by a detailed study of the genesis of mineralisation in a similar nearby prospect (Golden Valley and Moonlight Paleochannel deposits).
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drill hole logs and previous interpretations.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	The biggest change from this Resource to the previous was the recognition of a deep and well developed paleochannel which will contain the bulk of any ounces in a Reserve pit.
	The use of geology in guiding and controlling Mineral Resource estimation.	Interpretations and confining wireframes are developed using the geology related to the mineralised lodes. This includes lithology, alteration, veining, structure and mineralisation. This data is sourced from geological logging of drill holes and mapping. The 2017 drilling focused heavily on identifying/defining the Woodline Paleochannel.
	The factors affecting continuity both of grade and geology.	Continuity can be affected by expected variations in local deposition within the larger paleo channel.
Dimensions	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.	Mineralised portion of the Woodline Paleochannel extend over 800m strike and 100 min width, up to 80m deep. Top 30m is barren then consists of multiple, horizontal mineralised lenses. Porphyry related (fresh-rock) mineralisation is modelled over 900m of strike extend and with a dip extent of between 50m and 250m depending on the extent of drilling. The mineralised zone tends to be around 15m wide with the individual mineralised surfaces within that zone between one and two metres wide. Supergene mineralised surfaces are modelled in oxidised and transitional domains outside of the channel and are only a small component of the Resource.
Estimation and modelling techniques	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.	Drill data was composited to a nominal length of 1m for all domains. All supergene and primary intercepts are hard coded in the Mapfile to avoid re-snapping interpretation after collar adjustments. In the interpreted paleo channel, all blocks are 5m by 5m by 1m (vertical). Within the remainder of the model 10m by 10m by 10m blocks, sub celled to 1 by 1 by 1m m (elevation) are used. Small sub cells were used to reflect the narrow vertical primary structures. Drilling is nominally on 20m sections with some areas infilled to around 10m spacing. Search ellipses were orientated to match the strike and dip of each domain, paleochannel estimation is unconstrained. Inverse distance cubed was adopted as the grade estimation method. Validation steps undertaken included: • Visual comparison of model vs composite grades

Criteria	JORC Code explanation	Commentary
		• Swath plots based on RL in the paleochannel Comparison of grades estimated by inverse distance squared vs grades estimated by inverse distance cubed and grades estimated by nearest neighbour.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	The estimated grades were assessed against sample grades and, where applicable, previous estimates. This estimate is comparable in total ounces to the last reported model (2011).
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements detected or estimated. However high clay content has been identified in the channel mineralisation.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	10mE 10mN 10mRL parent blocks sub celled to 1m*1m*1m cells using 1m composites. Each block was estimated, no parent cells used. Search ellipsoids in the paleochannel are 40m*40m*1m. For footwall and hangingwall lodes that are tightly constrained, an ellipsoid was used with 60m*60m*60m, remaining supergene domains estimated with 30m*30m*4m. Drill hole spacing is a nominal 20 by 20m.
	Any assumptions behind modelling of selective mining units.	No assumptions made.
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Estimation is constrained within domain wireframes that are developed using the geology related to the mineralised lode. This includes lithology, alteration, veining, structure and mineralisation. This data is sourced from geological logging of drill holes and mapping. Paleochannel material is estimated with a small flat ellipsoid into unconstrained blocks.
	Discussion of basis for using or not using grade cutting or capping.	As is typical for gold deposits the data distributions are highly skewed and typically have a CV > 1.5 (ratio of standard deviation to the mean). In order to prevent overestimation top cuts were chosen.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Visual comparisons comparing drill hole composites and block model grades. Within the designed pit area, the comparison is favourable, outside the pit in areas of wider spaced drilling, high grades can be smeared. These areas however are not reported as Resource. Are is unmined so no reconciliation data is available.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Cutoff grade of 0.68gpt based on economics of the project, reported inside the designed pit shell.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The mineralisation is amenable to open cut mining methodology subject to gold price. Due to the deep weathering profile the entire pit would be mostly free dig, with limited drill and blast requirements.
Metallurgical factors or assumptions	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.	Metallurgical test work results show that the mineralisation is amendable to processing through the Kanowna Belle treatment plant, however high clay content has been identified in the channel mineralisation. Ore processing throughput and recovery parameters were estimated based on limited metallurgical sampling. More test work is in progress.
Environmental factors or assumptions	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 green fields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these	A "License to Operate" is held by the operation which is issued under the "Environmental Protection Act 1986", administered by the Department of Environmental Regulation (DER). The license stipulates environmental conditions for the control of air quality, solid waste management, water quality, and general conditions for operation. Groundwater licenses are held for water abstraction, including production bore field water use for mineral processing, and mine dewatering, in accordance with the Rights in Water and Irrigation Act 1914. These licenses are renewable

Criteria	JORC Code explanation	Commentary
	aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	on a regular basis. Kanowna Operations conduct extensive environmental monitoring and management programs to ensure compliance with the requirements of the licenses and lease conditions. The Kanowna operations are fully permitted including groundwater extraction and dewatering, removal of vegetation, mineral processing, and open pits.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk densities were assigned to the model based on the degree of weathering logged.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities have been taken directly from the 2011 Resource report.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classifications of Indicated and Inferred have been assigned primarily on drill density.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Input and geological data is assumed accurate.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This Mineral Resource estimate is considered representative within the designed pit area.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Resource estimate and supporting data has not been externally audited.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	Swath plots by northing, easting and RL were produced for each lode to verify that the model grades honoured the tenor of the drill hole grades.
	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.	This Resource report relates to the contiguous Woodline and Fenceline deposits. Each of the estimated lodes will show local variability even though the global estimate reflects the total average tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Deposit is unmined, no reconciliation data is available.

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Northern Star Resources Limited June 2017 Mineral Resource compiled by NSR Senior Development Geologist.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	A site visit has been completed, and covered aspects including site access, assessment of old workings, clearing requirements, and potential infrastructure placement.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	A minimum Pre-Feasibility level study is completed prior to converting an ore zone into ore Reserve.

Criteria	JORC Code explanation	Commentary
	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.	Ore Reserves have been calculated by generating detailed mining shapes for the proposed open pits. A series of nested optimised pit shells were generated using Whittle software, an analysis of the shells was completed to select one which was then used to complete a detailed pit design to closely resemble the selected whittle shell. The Whittle optimisation used parameters generated from NSR technical personnel and technical consultants. A detailed mine schedule and cost model has been generated using an excel spreadsheet model. Appropriate ore dilution and recoveries have been applied within the excel spreadsheet model.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	The pit cut-off grade has been calculated based on the key input components (processing, recovery and administration) Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. The AUD gold price as per corporate guidance. Mill recovery factors are based on historical data and metallurgical test work. Variable treatment costs to open pit mining for processing is a fundamental premise in the evaluation of open pit projects. Variable cut-off grade is used in the evaluation of open pit projects.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Mineral Resource is converted to Ore Reserve after completing a detailed mine design complete with a detailed financial assessment. The Mineral Resource block model is used. Ore Reserves have been calculated by generating detailed mining shapes for the proposed open pits. A series of nested optimised pit shells were generated using Whittle software, an analysis of the shells was completed to select one which was then used to complete a detailed pit design to closely resemble the selected whittle shell. The Whittle optimisation used parameters generated from NSR technical personnel and technical consultants.
	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.	The selected mining method for the Woodline & Fenceline deposits are of a bench mining open pit method. The proposed open pits are to be mined using conventional open pit mining methods (drill, blast, load and haul) by a mining contractor utilising 120 t class excavators and 90t trucks. This method is used widely in mines across Western Australia and is deemed appropriate given the nature of the ore body.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	Independent Geotechnical Consultants Dempers & Seymour Pty Ltd completed a geotechnical study for the Woodline project. Recommended wall angles were applied to the Whittle optimisation and subsequent detailed pit designs.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	
	The mining dilution factors used.	A mining dilution factor of 10% of zero grade has been applied for the reporting of Reserve physicals.
	The mining recovery factors used.	A mining recovery of 95% has been applied.
	Any minimum mining widths used.	The SMU dimensions for the Reserve Estimate are 2.0 m Wide x 5.0 m High x 5.0 m Long. A minimum mining width down to 20 m for final pit extraction from the base of pit has been used.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Inferred material has not been included within this Reserve estimate (treated as waste) but has been considered in LOM planning. It is assumed that Inferred material will be converted to Reserve via grade control drilling which has been provided for and will be carried out ahead of mining.
	The infrastructure requirements of the selected mining methods.	Infrastructure required for the proposed Woodline and Fenceline Open Pits have been accounted for and included in all work leading to the generation of the Ore Reserve estimate. As there is currently infrastructure

Criteria	JORC Code explanation	Commentary
		in place for the Kanowna Belle underground operations and the life of the Woodline project is limited planned infrastructure includes: Offices, workshops and associated facilities; Dewatering pipeline; Water will be pumped to a water storage pond and used for dust suppression. Any excess water will be pumped and discharged into Golden Feather pit located 900m to the south. Waste Dump; and RoM Pad. Processing will be conducted at the Kanowna Belle operation; hence no processing infrastructure is required. The Kanowna Belle plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits. The milling facilities are designed to process approximately 1.8 million tonnes per annum. The plant has the capability to treat both refractory and free milling ores, through either a flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery) or bypassing the flotation circuit and going directly to a CIL circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month. Ore Reserves are calculated using processing plant recovery factors that are based on test work and historical performance.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	The Kanowna Belle plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits. The milling facilities are designed to process approximately 1.8 million tonnes per annum. The plant has the capability to treat both refractory and free milling ores, through either a flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery) or bypassing the flotation circuit and going directly to a CIL circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month. Ore Reserves are calculated using processing plant recovery factors that are based on test work and historical performance.
	Whether the metallurgical process is well-tested technology or novel in nature.	Standard CIL extraction process utilising the existing KB processing facility.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Based on metallurgical test work carried out and milling experience gained through processing similar paleo channel material through the KB processing facility.
	Any assumptions or allowances made for deleterious elements.	No assumption made.
	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.	Based on metallurgical test work carried out and milling experience gained through processing similar paleo channel material through the KB processing facility.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	All ore from the Woodline Project will be trucked to the Kanowna Belle Processing Plant for processing. The Kanowna Belle Mine is operated subject to the requirements of the Western Australian Mining Act 1978 and the Mines (Safety) Act, regulated by the Department of Mines, Industry Regulation and Safety. The Mining Leases covering the Kanowna Belle operation stipulate environmental conditions for operation, rehabilitation and reporting. A "Licence to Operate" is held by the operation which is issued under the requirements of the "Environmental Protection Act 1986". Kanowna Belle is a prescribed premises requiring Department of Water and Environmental Regulation (DWER) licences to operate. It covers the following activities: • Crushing plant. • CIP process plant. • Sulphide concentrate roaster.

Criteria	JORC Code explanation	Commentary
		• Tailings dam cells 1 and 2. • Calcine tails dam. • Wastewater treatment plant. • Arsenic waste stabilisation plant and disposal into underground workings. • Open cut and underground mines. • Paste backfill plant. • Batch plant. The key environmental areas covered in the licence are: • Air pollution and control conditions. • Water pollution control conditions. • Solid waste conditions. Kanowna Belle holds groundwater licence GWL 62498-6 which includes the Woodline Project mining tenements. Dempers and Seymour Geotechnical Consultants completed a comprehensive geotechnical study for recommended wall angles and regulatory approval. There are no native title issues. Heritage surveys have been completed in the Woodline and Fenceline project. There are no heritage sites identified that impact on the designed pits or associated infrastructure. Flora & Fauna and hydrogeological studies have been completed. Updated Flora and Fauna field surveys are scheduled for September 2017. Soil characteristics studies have been completed.
Infrastructure	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.	The Woodline Project is located 6km north of Kanowna Belle and will be operated from the Kanowna Belle Mine Site. 2.5km of new haul road will be constructed to connect Woodline to existing NSR haul roads. The new section of haul road is on NSR 100% owned mining tenements. Minor infrastructure will be established at Woodline to support the project. Access to the Kanowna Belle operation is provided by well-maintained public and private roads. Employees reside in Kalgoorlie and commute to site daily. Potable water for the Kanowna Belle operations is pumped from Kalgoorlie to a storage facility on site. Non-potable water requirements are sourced from bore fields up to 10 km away from the mine site. Makeup water for the Kanowna Belle process plant is supplied by pipeline from a bore field located in the Gidgi palaeochannel approximately 15 km from the plant site with some water is sourced from abandoned pits. Electricity is provided by the state electricity grid. A 15 km long 33 kV line from Kalgoorlie provides all electricity requirements of the operations. Sources of fuel, such as diesel, gasoline, propane, etc., are readily available at competitive pricing from local suppliers, as there are multiple operating plants in the Kalgoorlie area.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Mining costs based on mining contract rates supplied by a reputable WA based mining contractor. Mining costs were built up from first principals on mine designs supplied by NSR. Capital costs were not included in the optimised parameter inputs. Capital costs based on quotes supplied and have been included in the Woodline economic cost model.
	The methodology used to estimate operating costs.	A capital and operating cost model has been developed in Excel and has been used to complete a life of mine cash flow estimate. Mining costs supplied by a reputable WA based mining contractor who built up costs from first principles from mine designs supplied by NSR.
	Allowances made for the content of deleterious elements.	No allowances made, none expected.

Criteria	JORC Code explanation	Commentary
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of AUD $1,500 per ounce as per corporate guidance.
	The source of exchange rates used in the study.	Not applicable.
	Derivation of transportation charges.	Transportation costs for ore haulage from Woodline to KB has been based on current NSR contractor schedule of rates. Transportation costs also include an allowance for adequate haul road maintenance and dust suppression.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Historic performance.
	The allowances made for royalties payable, both Government and private.	WA State Government royalty of 2.5%.
Revenue factors	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.	All financial analysis and gold price have been expressed in Australian dollars and no direct exchange rates have been applied. Revenue factors within the whittle optimisation process were used. A revenue factor shell was selected and used to complete a detailed pit design. A gold price of AUD $1,500 per ounce has been used in the optimisation of the Woodline Project.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	Gold doré from the mine is to be sold at the Perth mint.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not applicable.
	Price and volume forecasts and the basis for these forecasts.	Corporate guidance.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not applicable.
Economic	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.	The Ore Reserve estimate is based on a financial model for that has been prepared at a "pre-feasibility study" level of accuracy economic modelling. All inputs from mining operations, processing, transportation and sustaining capital as well as contingencies have been scheduled and evaluated to generate a full life of mine cost model. • Economic inputs have been sourced from suppliers or generated from database information relating to the relevant area of discipline. • A discount rate of 5% has been applied. • The NPV of the project is positive at the assumed commodity prices.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities have been used with gold price ranges of A$1,300 to A$1,700 per ounce.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	
	Any identified material naturally occurring risks.	No issues.
	The status of material legal agreements and marketing arrangements.	No issues.
	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	No issues.

Criteria	JORC Code explanation	Commentary
	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.	
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	Classifications of Measured, Indicated and Inferred have been assigned based on data integrity, continuity of mineralisation and geology, drill density and the quality of the estimation (kriging efficiency).
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results accurately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	Nil.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserves reporting processes has been subjected to an internal review by NSR Senior Technical personnel in July 2017.
Discussion of relative accuracy/ confidence	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.	The design, schedule and financial model on which the Ore Reserve is based has been completed to a "pre-feasibility study" standard, with a corresponding level of confidence.
	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.	Estimates are global but will be reasonable accurate on a local scale.
	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.	Not applicable.
	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.	Not applicable.

JORC Code, 2012 Edition – Table 1
Kanowna Surface (Six Mile Deposit) – 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Samples were obtained using reverse circulation (RC) drilling and HQ diamond drilling (DD).
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	For 2014, RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. 4m Composite spear samples were collected for the entirety each hole. The 1m split samples were then taken for any composite sample that returned an assay grade >0.1gpt. The 1m splits were also taken for composite samples either side of the anomalous composite. For 2015, RC drilling the 1m cone-split sample was submitted for assay for all intervals. For DD drilling, half core samples were submitted for assay. Holes were sampled at a nominal 1m sample interval, although this was varied to match geological criteria. The minimum sample size used is 0.3m.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Samples were taken to Genalysis Kalgoorlie for preparation by drying, crushing to <3mm, and pulverising the entire sample to <75µm. 300g pulp splits were then dispatched to Genalysis Perth for fire assay 50gm charge and AAS finish analysis. Anticipated high grade zones were analysed by 1kg Leachwell or triplicate fire assay analysis.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	RC drilling is completed using a 5.75" drill bit, downsized to 5.25" at depth. Historically, RAB, Aircore, RC and DD holes have been drilled in the area. Historic DD in the area has been conducted in NQ2 diameter (50.5mm). Recent DD core was drilled in HQ diameter and oriented using the Reflex ACT Core orientation system.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Core is measured and any determined loss recorded in the database. RC samples are routinely weighed to assess recovery.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	RC drilling contractors adjust their drilling approach to specific conditions to maximise sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified during 2014-2015 RC drilling. For diamond drilling the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	No bias has been noted.
Logging	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.	RC chips were sieved, washed and logged. RC sample chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all logged separately for each metre. Where possible, quantitative measures are used such as percentage values for individual minerals or vein types. All DD holes were logged to end of hole for regolith, lithology, alteration, veining and mineralisation. Where possible, quantitative measures are used such as percentage values for individual minerals or vein types. Quantitative structural measurements were also taken.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	RC sample chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	For DD highly oxidized saprolite, full core samples were submitted for assay as the sample deteriorates significantly upon cutting. Once competent core is reached, sampling switches to half core sampling.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. These samples were submitted to the lab from any zones approaching known mineralisation and from any areas identified as having anomalous gold. Outside of mineralised zones, spear samples were taken over a 4m interval for composite sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sample preparation is considered appropriate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Field duplicates were taken for RC samples at a rate of 1 in 20. For the composite samples the spearing process was repeated from the opposite side of the green bag. For 1m split samples, the full rig sample was passed through a riffle splitter to provide a duplicate. For 2015 RC drilling, the duplicate was taken from the cone splitter. No duplicate sampling of core (sending the remaining half core sample) has been conducted as the geological value of the core is considered higher than the need to duplicate sample.
	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.	Sample preparation was conducted at Genalysis Kalgoorlie, commencing with sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Core samples are jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg, a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverised to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. For fire assay, 300g pulp subsample is taken with an aluminium scoop and stored in labelled pulp packets. For Leachwell, 1kg of pulped sample is taken.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50g Fire assay charge is used with a lead flux, dissolved in the furnace. The prill is totally digested by HCl and HNO3 acids before Atomic absorption spectroscopy. Repeatability of sub-samples was outside acceptable limits with 2014 DD drilling indicated the presence of coarse gold within cm scale stockwork veining as the likely cause for the poor repeatability. In order to improve assay repeatability test work analysing 1kg samples using the Leachwell technique with AAS finish, was completed on coarse bulk reject sample from 2014 RC and DD drilling. Leachwell is not to "total" technique, but is considered to approximate the cyanide extractable gold that would be recovered in routine metallurgical processes. The initial conditions involved a 12-hour bottle roll. A fire assay on the Leachwell tails was completed to assess how effective the method had been in extracting the gold. The initial test work indicates a slightly longer bottle roll is required to leach the coarse gold. Additional test work utilizing a 24hr bottle roll is planned. Leachwell was not available for 2015 Diamond Drilling so a triplicate fire assay was sued for zones with anticipated coarse gold. The average was then taken as the final sample grade.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples. This is random, except where high grade mineralisation is expected. Here, a Blank is inserted after the high grade sample to test for contamination. Failures above 0.2gpt are followed up, and re-assayed. New pulps are prepared if failures remain. Field Duplicates are taken for all RC samples (1 in 20 sample). No Field duplicates are submitted for diamond core.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent person to be signed off.
	The use of twinned holes.	No twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging is entered directly into an Acquire database. Logs are exported to csv files. A hardcopy and electronic copy of this csv file is then stored. Assay files are received in csv format and loaded directly into the

Criteria	JORC Code explanation	Commentary
		database by the Project Geologist. A geologist then checks that the results have inserted into the database correctly. Hardcopy and electronic copies of these are also kept. No adjustments are made to this assay data.
	Discuss any adjustment to assay data.	Planned holes are pegged using a Differential GPS (DGPS) by field assistants.
Location of data points	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.	During drilling, single-shot magnetic surveys are taken every 30m to ensure the hole remains close to design. This is performed by the driller using the Globaltech Pathfinder DS1 survey system and checked by the supervising geologist. A final survey is taken once the end of hole is reached.
	Specification of the grid system used.	The final collar is picked up after hole completion by Differential GPS in the MGA 94 Zone 51 grid.
	Quality and adequacy of topographic control.	For 2014 DD drilling, each hole was gyroscopic surveyed to verify the single shot surveys. Topographic control is through an airborne survey conducted in 2009 by Survey Graphics mapping consultants using airborne DGPS (Differential Global Positioning System). Alternative frames were orthorectified using a 30m DEM within the mapping area and a 50m DEM outside the mapping area, captured using photogrammetry. This topographic control has been verified by the DGPS pickup of numerous hole collars
Data spacing and distribution	Data spacing for reporting of Exploration Results.	No exploration results reported.
	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.	The data spacing is considered appropriate. Drill hole spacing across the area greatly varies. Up to 100m below surface, spacing is typically 40m x 40m which is reduced at depth where few drill holes intersect ore.
	Whether sample compositing has been applied.	No compositing has been applied during sampling.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	No sampling bias is considered to have been introduced by the drilling orientation.
	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.	There are various mineralised orientations at Six Mile, including porphyry contacts and stockwork lodes, with two main shear orientations; NW-trending shears dipping steeply (70-80°) to the SW and ENE trending shears dipping steeply (70-80°) to the South. Many of the drill holes in the Six Mile area have been drilled at poor orientations to these structures due to poor understanding of the geology prior to the recent interpretation. Wherever this has occurred, it is clearly noted in the report. These holes are only suitable as an exploration tool for further targeting and are unlikely to be used in any future Resource.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources' in a secure yard. Once submitted to the laboratories, they are stored in a secure fenced compound and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	An internal review of RC sampling has been conducted to determine if the low repeatability is due to coarse gold, poor sampling or both. A number of steps have been taken to improve the primary sampling including the fitting of an additional arm and spirit level to the cone splitter to ensure it is kept straight and training drill offsiders in sample theory to help ensure a more consistent sample.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All holes mentioned in this report are located within on Mining Lease M27/63, held by The Kanowna Mines Ltd, a wholly owned subsidiary of Northern Star Resources.
	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.	No known impediments exist and the tenements are in good standing.

Criteria	JORC Code explanation	Commentary
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Western Mining Corporation (WMC) commenced exploration in the Six Mile AREA in 1983. Early exploration consisted of costeans, followed by RC drilling. A Resource of 119,482 tonnes @ 3.2gpt was calculated and mining began in 1986. Mining ceased in 1988 due to reconciliation issues. In the mid 1990's, 3 DD holes were drilled by WMC to test for mineralisation below the main pit, although assay results were poor. The current location of the core is unknown. Delta Gold acquired the tenement in 2000 and drilled 20 RC holes and 1 DD hole below the existing pit. This allowed a Resource to be calculated of 2.6 million tonnes @ 2.1gpt. Placer Dome subsequently acquired the tenement through their takeover of Aurion Gold in 2002 and conducted no exploration until the Barrick takeover in 2004. Barrick Gold conducted channel sampling of the pit walls in 2007 followed by 2 DD holes in 2008 with limited success.
Geology	Deposit type, geological setting and style of mineralisation.	The Six Mile deposit is situated within the Boorara domain of the Kalgoorlie Terrane, part of the Norseman-Wiluna Greenstone Belt. The Scotia-Kanowna dome, a D2 granodiorite pluton, intrudes a Boorara domain sequence of lower basalt, komatiites, upper basalt and felsic volcanics The Six Mile area is dominated by massive chlorite-amphibole basalt with at least two phases of quartz feldspar porphyry intrusion. Two main shear orientations exist within the pit. NW-trending and ENE-trending. Mineralisation occurs within quartz-carbonate veins hosted by these discrete shears Stockwork mineralisation is hosted within the basalt in proximity to shallow to moderately dipping lodes. Mineralisation also exists on the Footwall and Hangingwall of porphyry contacts. The Main Fletcher Porphyry hosts consistent low grade mineralisation, and a supergene lode exists in the Main Pit zone.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically list the complete dataset, the long section and plan reflect the hole positions used for previous estimation stated. No exploration results reported.
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No exploration results reported
	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.	No exploration results reported.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No exploration results reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No exploration results reported.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	No exploration results reported.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	No exploration results reported.
Diagrams	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.	Appropriate plans and section have been included in this report.

Criteria	JORC Code explanation	Commentary
Balanced reporting	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.	No exploration results reported.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No further relevant work has been carried out at the Six Mile project.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Following the reinterpretation of the Six Mile project, and the creation of a new geological model, a Resource modelling exercise was undertaken. It is envisaged that further drilling will be undertaken to increase the confidence in the area and convert the Inferred Resource to Indicated, as well as increasing the size of the reportable Resource.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

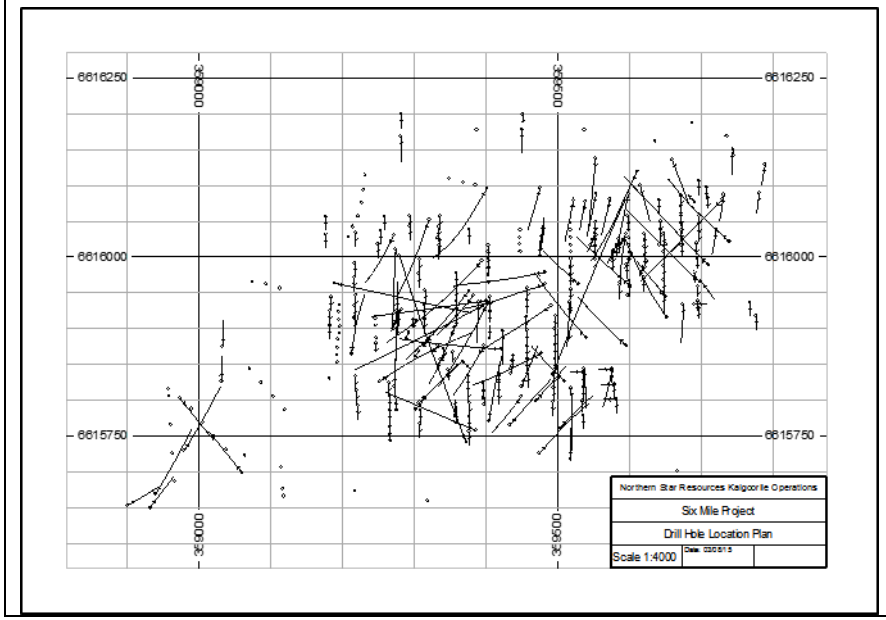
Criteria	JORC Code explanation	Commentary
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	All data is stored in a digital database with logging of changes and management of data integrity. Validation is enforced when the data is captured. Data is exported to ASCII files before importation into Resource modelling software, no manual editing is undertaken on any data during the export/import process.
	Data validation procedures used.	Random checks through use of the data and data validation procedure prior to Resource estimation.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Multiple site visits undertaken by geologists supervising the drilling programs and preparing the geological interpretation.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	There is reasonable confidence in the geological interpretation. The geological interpretation is based on a combination of geological logging and mapping within the existing pit. Geological logging includes both contemporary and historic data. The main geological features are exposed in the existing pit and are believed to be well understood. Geological features not exposed are solely supported by drill data.
	Nature of the data used and of any assumptions made.	Nil.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative estimates have been conducted.
	The use of geology in guiding and controlling Mineral Resource estimation.	Wireframes of the interpreted geology have been used to constrain mineralisation.
	The factors affecting continuity both of grade and geology.	Grade continuity is affected by a high component of coarse gold distributed throughout the mineralisation. Geological structures are complex interplay of structure and intrusive bodies.
Dimensions	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.	Mineralisation has been identified over a strike length of approximately 600m and over a depth of approximately 350m. Mineralised horizons vary in thickness between 2.6m and 15m, with an average thickness of around 3.0m.
Estimation and modelling techniques	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.	Drill holes were composited into 1m intervals down hole within each interpreted domain. The composite lengths were allowed to vary between half and one and a half times the nominal composite length to ensure that no sampling was lost during the compositing process. The average grade and total length of the composite data was compared against the average grade and total length of the un-composited data to check the compositing process. The distribution of composite lengths was checked to ensure that the majority of the composites were close to the targeted length.

Criteria	JORC Code explanation	Commentary
		Simple Ordinary Kriging was used to estimate all mineralised domains. The local mean values used during Simple Kriging was estimated from the declustered mean of the top-cut composited sample data.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	The estimated grades were assessed against sample grades and, where applicable, previous estimates.
	The assumptions made regarding recovery of by-products.	No assumptions are made.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Grades were estimated into 20m(E-W) x 5m(N-S) x 20m (RL) panels for the majority of domains. Two supergene domains were estimated using 20m(E-W) x 20m(N-S) x 5m(RL) panels. The majority of domains were estimated in 2D, where a significant proportion of the domain was thicker than 5m, grades were estimated in 3D. Search distances used for estimation based on variogram ranges and vary by domain.
	Any assumptions behind modelling of selective mining units.	No assumptions made.
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill core logs.
	Discussion of basis for using or not using grade cutting or capping.	Top-cuts were applied to the sample data based on a statistical analysis of the data and vary by domain.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	The Kriging neighbourhood was refined using statistical measures of Kriging quality. The estimated grades were assessed against sample grades and against declustered mean values.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Cut-off grades for reporting the Resource were developed using a gold price of A$1,700 and budgeted Kanowna Belle mining costs for 2015-16.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	An open pit optimisation study was run to select the portion of the model to be included in the Resource tabulation. Dilution and recovery factors were included in the optimisation study. Mining costs were developed with reference to typical unit costs currently available. The reported Resource is contained within the optimum shell for an A$1,700/oz. gold price.
Metallurgical factors or assumptions	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.	Metallurgical recovery factors have been developed based on extensive experience processing similar material from the Kanowna area.
Environmental factors or assumptions	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 green fields 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.	The utilisation of existing Kanowna Belle infrastructure will minimise the impact of development of the project. It has been assumed that the permits required for the operation will be readily obtainable.

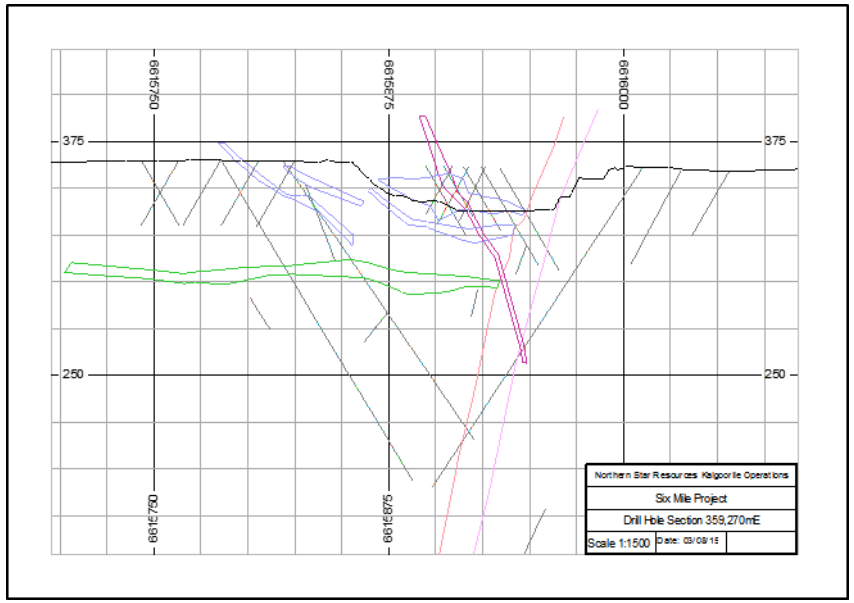
Criteria	JORC Code explanation	Commentary
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density measurements from project drilling and from production within the area were used to assign values within interpreted weathering horizons.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities are applied to domains for the ore zone and by oxidation state.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on a series of factors including: Geologic grade continuity. Density of available drilling. Statistical evaluation of the quality of the kriging estimate.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Appropriate account has been take of relevant factors.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This mineral Resource estimate is considered representative.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The Mineral Resource model has been reviewed internally by Northern Star Principal Resource Geologist.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This Mineral Resource estimate is considered as robust and representative of the Six Mile style of mineralisation. The estimate is considered to be robustly estimated on a global scale for material classified as Inferred.
	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.	Global estimate, with local variation to be expected.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No production data to compare.

SIX MILE - REPRESENTATIVE PLAN AND CROSS SECTION

Plan view: Six Mile Resource drill collars and Traces



Cross Section: Six Mile Resource with drilltraces and mineralisation interp



JORC Code, 2012 Edition – Table 1
Kanowna Belle (Kanowna Belle Pit, UG & Velvet Deposit) – 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	The deposit is sampled in majority by diamond drilling (DD) and reverse circulation (RC) drilling. Sample intervals are defined by the geologist to honour geological boundaries. DD core was orientated, measured and then sampled by cutting the core in half longitudinally using an "Almonte" diamond saw. Cutting was along orientation lines, which are retained in the tray or where orientation lines are absent along cutting lines marked on the pieced core.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Sample intervals are marked on the core by a geologist typically every 1m to honour geological boundaries. Sample interval lengths vary from 0.3m and 1.3m (NQ). The same half of the core was selected for each sample interval, placed in numbered calico bags and submitted to the laboratory for analysis. The other half of the core was left in the core tray which was stamped for identification, stored and catalogued. A minor amount of infill or grade control drilling was submitted as whole core. Due to the refractory nature of the mineralisation there is very little free, coarse gold. It is considered that the half core samples submitted for assay are representative of the ore being sampled.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Assaying is by fire assay with a 40 or 50g charge and AAS analysis for gold. All sampling data is entered onto logging sheets or tablet computer and entered into the central Acquire database. Some historic RC holes from surface and the pit were also used for Resource estimation. These holes typically have 2m sample intervals.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Kanowna Belle Resource: 643 RC holes and 3757 diamond holes were used for estimation. DD core is mostly NQ with some BQ, HQ and LTK60. Depth of diamond tails are generally 20-30m. 130 face samples were also used in the estimate. Where appropriate diamond core was orientated using a spear, Ballmark™, Ezimark™, or ACE multi electronic tool.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	DD core recovery factors are generally very high with in excess of 95% recovery. RC recovery was also recorded as good to very good. Historic DD core stored onsite shows excellent recovery.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For DD, the contractors adjust the rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geologist. Any issues are communicated back to the drilling contractor. Some loss occurred when drilling through fault zones such as the Fitzroy Fault. Areas of potential lower recovery were generally known beforehand and controlled drilling techniques were employed to maximise recovery.
	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.	There is no known relationship between recovery and grade.
Logging	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.	All DD core was logged by geologists with lithology, mineralisation, structure, alteration, veining and specific gravity were recorded. Quantitative measures such as structural measurements, intensity of alteration, percentage of mineralisation, thickness of veins and veins per metre were also recorded. Geotechnical measurements on DD core include RQD, Recovery, and Fracture Frequency. For selected holes joint sets, infill, infill thickness and roughness were also geotechnically measured. Photographs are taken of each core tray when wet. All mineralised intersections are logged and sampled.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is qualitative and all core is photographed. Visual estimates are made for mineralisation percentages for core.
	The total length and percentage of the relevant intersections logged.	100% of the drill core is logged.
	If core, whether cut or sawn and whether quarter, half or all core taken.	DD core is sampled by sawn half-core on intervals controlled by geological domaining represented by mineralisation, alteration and lithology. A selected number of grade control holes were full cored. Mineralised

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation		intersections are sampled with a maximum and minimum length of 1.3m and 0.3m, respecting lithological or alteration contacts. The down hole depth of all sample interval extents are recorded.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Development face samples are chipped directly off the face into a sample bag aiming for sample size of at least 2.5kg. Samples are a maximum of 1.3m in width and honour geological boundaries. Samples are taken horizontally across the mineralisation.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sample preparation is considered appropriate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Most holes have all intervals sampled.
	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.	Quarter core sampling is sometimes undertaken as a check, however routine field duplicates are not performed on diamond core as these are not considered to be true duplicates.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Grind checks are performed at both the crushing stage (3mm) and pulverising stage (75µm) requiring 90% of material to pass through the relevant size.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	All samples are prepared and assayed at commercial laboratories. Entire samples are crushed/pulverised to 95% minus 75µ, splitting off 200g and preparing a 50g charge for fire assay with an atomic absorption finish (FA/AA) for Au, LECO for S and inductively coupled plasma (ICP) for As and other multi-elements. Monthly QAQC reports are prepared to check for any bias or trends with conclusions discussed with the laboratory management. Holes that do not pass QAQC are not used for Resource estimation.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Sampling and assaying QAQC procedures include: Periodical resubmission of samples to primary and secondary laboratories. Submittal of independent certified reference material. Sieve testing to check grind size. Sample recovery checks. Unannounced laboratory inspections. Standard control samples and blanks purchased from certified commercial suppliers are inserted at a ratio of 1:20. The standard control samples are changed on a 3-month rotation. The results are reviewed on a per batch basis and batches of samples are re-analysed if the result is greater than three standard deviations from the expected result. Any result outside of two standard deviations is flagged for investigation by a geologist and may also be re-assayed. Primary laboratory Bureau Veritas meets ISO 9001:2000.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent Person to be signed off.
	The use of twinned holes.	No Twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All assay data adheres to Kanowna QAQC standards and is further validated by a qualified person before it can be used in the Resource estimation process. All data is stored in the site Acquire database with hard copies of all logging and sample results filed for each hole. Assay files are received in csv format and loaded directly into the database by the supervising geologist who then checks that the results have inserted correctly. Hardcopy and electronic copies of these are also kept. Holes that cannot be accurately validated or do not meet the requirements of Kanowna QAQC are excluded prior to estimation.
	Discuss any adjustment to assay data.	

Criteria	JORC Code explanation	Commentary
Location of data points	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.	All collar positions were surveyed. All recent DD holes were surveyed down hole by various methods including single shot down hole camera, EMS (Electronic Multi Shot) method or in-rod gyroscopic survey tools. Holes are typically surveyed at 15m and 30m intervals down hole thereafter. Since the 1st of June 2015, a true north seeking gyroscopic tool has been used to line up the rig and record a zero-meter survey. Any poor surveys are re-surveyed and in some cases holes have been gyroscope surveyed by ABIMS for non-magnetic affected survey. If survey data was missing or quality was suspect and not replaced by more recent drilling, affected data was not used in estimation. A local grid system (KBMINE grid) is used. It is rotated anticlockwise 28.43 degrees to the MGA94 grid. Drill hole collars are located by the underground mine surveyors using a Laser system respective to the local mine grid and to the overall property in UTM or Australian grid coordinates Topographic control is not relevant to the underground mine.
	Specification of the grid system used.	
	Quality and adequacy of topographic control.	
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing is nominally 40m x 40m down to a nominal 20m x 20m in the main zones of mineralisation at Kanowna. Secondary mineralised structures in the hanging wall and footwall are typically narrower and less consistent so have a nominal drill spacing of 15m x 15m. The spacing of 20x20m and 15x15m in conjunction with geological continuity and confidence is used to assign classifications of Indicated in the Resource estimation model. Samples have been composited to 1m, which is the dominant sample length, prior to estimation. The Velvet drill core results are compiled into significant intersections for assay result reporting.
	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.	The data spacing is considered appropriate
	Whether sample compositing has been applied.	No compositing has been applied to these exploration results, although composite intersections are reported.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of drilled data is perpendicular to the interpreted strike of the Kanowna orebodies where possible.
	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.	Holes with orientations that are considered likely to introduce sampling bias are excluded from the estimation during the validation process.
Sample security	The measures taken to ensure sample security.	All core is kept within the site perimeter fence on the Mining Lease M27/103. Samples are dispatched and/or collected by an offsite delivery service on a regular basis. Each sample batch is accompanied with a • Job number. • Number of Samples. • Sample Numbers (including standards and duplicates). • Required analytical methods. • A job priority rating. A Chain of Custody is demonstrated by both Company and Bureau Veritas in the delivery and receipt of sample materials. Any damage to or loss of samples within each batch (e.g. total loss, spillage or obvious contamination), is reported to the Company in the form of a list of samples affected and detailing the nature of the problem(s)
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	The last external audit was conducted in 2009 with the conclusion that industry best practice was being followed. Standards and procedures have remained largely unchanged since this time. A review of sampling techniques, assay results and data usage was conducted internally by the Companies' Principal Geologist during the model peer review process with no material issues. Mining Plus (External Consultants) assisted with the construction of the MY2017 Resource model and did not note any fatal flaws.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	The Kanowna Belle mine and associated infrastructure is located on Mining Leases M27/92 and M27/103. Mining lease M27/92 (972.65 ha) was granted on March 14 1988 and M27/103 (944.25 ha) was granted on January 12 1989. Both leases were granted for periods of 21 years after which they can be renewed for a further 21 years. The Mining Leases and most of the surrounding tenement holdings are 100% owned by Northern Star (Kanowna) Pty Limited, a wholly owned subsidiary of Northern Star Resources Limited. The mining tenements are either located on vacant crown land or on pastoral leases. The leases containing the deposit are pre-1994 leases so are not subject to Native Title claims.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Kanowna was discovered in 1989 by Delta Gold, open pit mining commenced between 1993 and 1998 resulting in a 220m deep pit. Underground operation began in 1998. In 2002, Delta Gold Limited and Goldfields Limited merged to form Aurion Gold Limited and Placer Dome Inc. (Placer Dome) subsequently acquired Aurion Gold Limited. In 2006 Barrick Gold Corporation acquired Placer Dome and in 2014 Northern Star acquired the operation from Barrick. Exploration drilling is ongoing from underground to extend the known mineral Resources.
Geology	Deposit type, geological setting and style of mineralisation.	Kanowna Belle is located within the Kalgoorlie Terrane, one of a number of elongate, broadly NNW-SSE striking structural-stratigraphic late Archaean greenstone terranes of the Eastern Goldfields of Western Australia. The Kanowna Belle gold mine is located close to the centre of the NNW-SSE trending, greenstone-dominated Boorara Domain, the eastern most subdivision of the Kalgoorlie Terrane. The Kanowna Belle deposit can be categorised as a refractory, Archean lode-gold type deposit. The orebody is comprised of several ore shoots, including the large Lowes Shoot, and several smaller lodes including Troy, Hilder, Hangingwall and Footwall shoots controlled by sets of structures of various orientations oblique to Lowes. Lowes contains some 80% of known gold mineralisation and strikes ENE, dips steeply SSW and plunges steeply SW. Lowes Shoot has a strike length of 500m, width of 5m to 50m and down-plunge extent greater than 1,250m. The overall steep SE plunge is interpreted to reflect the intersection of D1 (ENE) and D2 (NW) structures Kanowna Belle is one of the only known refractory pyritic orebodies in the Yilgarn Craton. Gold in the Kanowna Belle deposit occurs mostly as fine-grained (<10 µm) inclusions in pyrite or as very fine-grained gold located in arsenic-rich growth zones in pyrite. Typical ore assemblages contain 0.5% S to 1.5% S and 40 ppm As. The Kanowna Belle deposit is hosted by sedimentary volcanoclastic and conglomeratic rocks which are separated into hangingwall and footwall sequences by a major, steeply SSE dipping zone of structural disruption. This structure represents the product of at least three distinct stages of deformation, comprising the Fitzroy Mylonite, the Fitzroy Shear Zone and the Fitzroy Fault, which have produced clear structural overprinting relations. Importantly, this structure has localised emplacement of the Kanowna Belle porphyry which hosts at least 70% of known mineralisation. Localisation of high grade mineralisation and most intense alteration around the composite structure emphasises its importance for acting as the major plumbing system for fluids. Formation of the Fitzroy Mylonite and Fitzroy Shear Zone are interpreted to have occurred during regional south-to-north D1 thrusting. A switch in far-field stress axes to the approximately ENE-WSW D2 orientation caused reactivation of the Fitzroy Shear Zone, resulting in sigmoidal folding of pre-existing structures and formation of a shallow lineation associated with sinistral transcurrent shearing. The Kanowna Belle porphyry cross-cuts fabrics associated with the D1 Fitzroy Mylonite and Fitzroy Shear Zone and is in turn overprinted by S2.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically list, the long section and plan reflect the hole positions used for previous estimation stated.

Criteria	JORC Code explanation	Commentary
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	All reported assay results have been length weighted to provide an intersection width. A maximum of 2m of barren material between mineralised samples has been permitted in the calculation of these widths.
	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.	No assay results have been top-cut for the purpose of this report. A lower cut-off of 1gpt has been used to identify significant results, although lower results are included where a known ore zone has been intercepted and the entire intercept is low grade.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values have been used for the reporting of these exploration results.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	True widths have been calculated for intersections of the known ore zones, based on existing knowledge of the nature of these structures. The orientation of the Velvet mineralisation is not fully known at this point in time.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Both the downhole width and true width have been clearly specified when used.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Where mineralisation orientations are known, downhole lengths are reported.
Diagrams	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.	Appropriate plans and section have been included in this report.
Balanced reporting	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.	Both high and low grades have been reported accurately, clearly identified with the drill hole attributes and 'From' and 'To' depths.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Nil.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	KB Resource: Further mine planning work is planned for the area of the Mineral Resource model. The down dip extension of the KB Mineral Resource will be drill tested from the 9245 Exploration drive. Velvet: Because of the difficulty in targeting the mineralisation from current development, an exploration decline has been completed to better asses the mineralisation.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	The Kanowna-Belle Resource data is stored in an Acquire database. The Company employs a database administrator to manage the database. Data was logged onto sheets and entered directly into the database by geologists working on the project. User access logs are maintained for all fields in the dataset. Data validation tools and sign off facilities to record data cross-checking have occurred. Original data sheets and files are retained and used to validate the contents of the database against the original logging.
	Data validation procedures used.	Random checks through use of the data and data validation procedure prior to Resource estimation.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Site visits are conducted at least monthly to check and advise on modelling techniques and to introduce more appropriate techniques.
	If no site visits have been undertaken indicate why this is the case.	Site visits were undertaken.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach honouring the continuity of the geology and applying that to the estimation of the mineral Resource. The confidence in the geological interpretation is high with the information gained from ore development and underground drilling. Mine to mill reconciliations add strong support to the interpretation. Interpretations of the mineralised zones were developed from diamond drill data and further refined with underground geological mapping. Interpretations and confining wireframes are developed using the geology related to the mineralised lode. This includes lithology, alteration, veining, structure and mineralisation. This data is sourced from geological logging of drill holes and mapping.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drill holes, face maps, 3D photogrammetry, structures.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed.
	The use of geology in guiding and controlling Mineral Resource estimation.	Interpretations and confining wireframes are developed using the geology related to the mineralised lode. This includes lithology, alteration, veining, structure and mineralisation. This data is sourced from geological logging of drill holes and mapping.
	The factors affecting continuity both of grade and geology.	Continuity can be affected by changes in lithology, dilation of structures, intersecting structures, vein density and proximity to the main ore body.
Dimensions	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.	The near-surface weathered portion of the zone deposit shows significant gold depletion to at least 35 m above an undulating supergene "blanket" horizon. This mineralised blanket had plan dimensions of 600 m x 250 m and a thickness of 1m to 10 m. The main Lowes shoot has a strike length of 500 m, width of 5 m to 50 m, and a down-plunge extent greater than 1,250 m. Hanging wall shoots have a maximum strike of 240m, width of 2m to 10m and a current down plunge extent of no more than 700m. Footwall shoots have a maximum strike of 240m, width of 2-20m and a current down plunge extent of no more than 500m.
Estimation and modelling techniques	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.	Grade estimation for gold and Sulphur were completed using Datamine Studio 3 software. Geostatistical analysis and variography were completed using Snowden's Supervisor software. The estimation was by ordinary kriging into 10mE, 5mN, 10mRL parent cells using 1m composites. For footwall and hangingwall lodes that are more oblique to the mine grid, 5mx5mx5m parent cells are used. Estimations are constrained by hard domain boundaries (wireframes) to prevent the overestimation of cells outside of mineralised envelopes. 1m sample composites are used which is the dominant sample length.

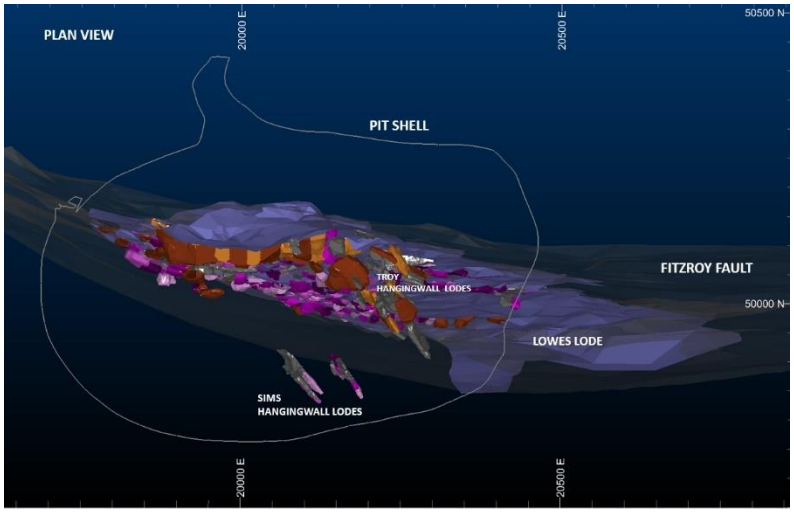
Criteria	JORC Code explanation	Commentary
		Domains were further checked to geostatistically contain single grade populations and whether further refinement was required. Search ellipses and ranges were based on the continuity seen in the variograms. Kriging efficiency, slope of regression and the sum of any negative kriging weights were reviewed to assess the estimation quality and optimise the estimation parameters. For pass 1 estimations, a minimum of 10 samples and a maximum of 30 samples were often used. Octants were often used to ensure that multiple drill holes were used from multiple directions. If octants were not used the maximum number of composites from a single drill hole was set at 5. Estimates are compared against previous estimates and variances recorded and justified. It is assumed that some minor silver will be recovered with the gold. The silver is not estimated as it is not economically significant. Sulphur can be deleterious to the gold extraction process when it exceeds concentrations of 1.6%. Sulphur is therefore estimated using ordinary kriging although it is not constrained by domain wireframes. Over the past 12 months Sulphur levels in the processing plant have been 101% of that predicted in the Sulphur estimation model.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	The estimated grades were assessed against sample grades and, where applicable, previous estimates. The estimate was also reconciled to historic production.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is use for economic estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	Sulphur can be deleterious to the gold extraction process when it exceeds concentrations of 1.6%. Sulphur is therefore estimated using ordinary kriging although it is not constrained by domain wireframes. Over the past 12 months Sulphur levels in the processing plant have been 101% of that predicted in the Sulphur estimation model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	10mE 5mN 10mRL parent cells using 1m composites. For footwall and hangingwall lodes that are more oblique to the mine grid 5x5x5 parent cells are used. Search ellipsoids for the main lode are 70m*50m*20m and vary down to 50m*20m*12m on the narrower and more variable footwall and hangingwall lodes. Drill hole spacing is 20m on the main lode and 15m on the HW and FW splays.
	Any assumptions behind modelling of selective mining units.	No assumptions made.
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Estimation is constrained within domain wireframes that are developed using the geology related to the mineralised lode. This includes lithology, alteration, veining, structure and mineralisation. This data is sourced from geological logging of drill holes and mapping.
	Discussion of basis for using or not using grade cutting or capping.	As is typical for gold deposits the data distributions are highly skewed and typically have a CV > 1.5 (ratio of standard deviation to the mean). To prevent overestimation top cuts were chosen.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Swath plots by northing, easting and RL were produced for each lode to verify that the model grades honoured the tenor of the drill hole grades. Production reconciliation data is used to check the accuracy of estimation. Over the past 12 months' ounces produced have been 124% of that predicted in the grade estimation model.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Various cutoff grades are calculated including a break even cutoff grade (BCOG), incremental cutoff grade (ICOG) and Mill cutoff grade (MCOG). The BCOG is used as the basis for stope design, though any areas which are marginal or require significant development are assessed by a more detailed financial analysis to confirm their profitability. Kanowna Belle operates at several horizons in the mine from as shallow as 170m down to over 1,000m of depth. With depth, come additional costs in terms of haulage and ground support. Consequently, several cut-off grades take this into account. Cut-off grades are applied on a block by block basis depending on the relative costs.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters	The mineralisation is amenable to open cut and underground mining methodology subject to gold price. Underground operations at Kanowna Belle are limited by mine depth and seismic activity. Mine sequencing is optimised for geotechnical considerations and the mining of individual blocks is constrained by the sequence and stress regime. Ultimately this impacts the operation by limiting the number of small stopes that can be mined in isolation and there is limited ability to leave single low grade stopes as pillars when surrounded by mining areas.

Criteria	JORC Code explanation	Commentary
	when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	
Metallurgical factors or assumptions	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.	Metallurgical test work results show that the mineralisation is amendable to processing through the Kanowna Belle treatment plant. Ore processing throughput and recovery parameters were estimated based on historic performance and potential improvements available using current technologies and practices.
Environmental factors or assumptions	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 green fields 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.	A "License to Operate" is held by the operation which is issued under the "Environmental Protection Act 1986", administered by the Department of Environmental Regulation (DER). The license stipulates environmental conditions for the control of air quality, solid waste management, water quality, and general conditions for operation. Groundwater licenses are held for water abstraction, including production bore field water use for mineral processing, and mine dewatering, in accordance with the Rights in Water and Irrigation Act 1914. These licenses are renewable on a regular basis. Kanowna Operations conduct extensive environmental monitoring and management programs to ensure compliance with the requirements of the licenses and lease conditions. The Kanowna operations are fully permitted including groundwater extraction and dewatering, removal of vegetation, mineral processing, and open pits. Compliance with air quality permits is required due to the roaster operation and because there are two facilities in the Kalgoorlie region emitting SO_2 gas. Kanowna has a management program in place to minimise the impact of SO_2 on regional air quality, and ensure compliance with regulatory limits.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	A simple water immersion method referred to as the MARCEY Technique was used for the measurements, where the samples are dried and weighed in air then weighed in water.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones and underground environment.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	The bulk density of all samples is determined using the water displacement method (SG). A global density factor of 2.75 t/m3 is used for the purposes of Resource estimation at Kanowna Belle representing the average density recorded from core sample measurements. No significant differences were found between the various rock types to warrant additional refinement to the Resource model.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classifications of Measured, Indicated and Inferred have been assigned based on data integrity, continuity of mineralisation and geology, drill density and the quality of the estimation (kriging efficiency).
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Input and geological data is assumed accurate and supported by successful mining history at the site on this mineralisation.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This Mineral Resource estimate is considered representative.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	In 2009, NI 43-101 report and Reserve audit, conducted by Scott Wilson Roscoe Postle Associates Inc. concluded industry best practice adhered to. June 2015 model internally reviewed by company Principal Resource Geologist (Competent Person). No material issues found.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	Swath plots by northing, easting and RL were produced for each lode to verify that the model grades honoured the tenor of the drill hole grades.

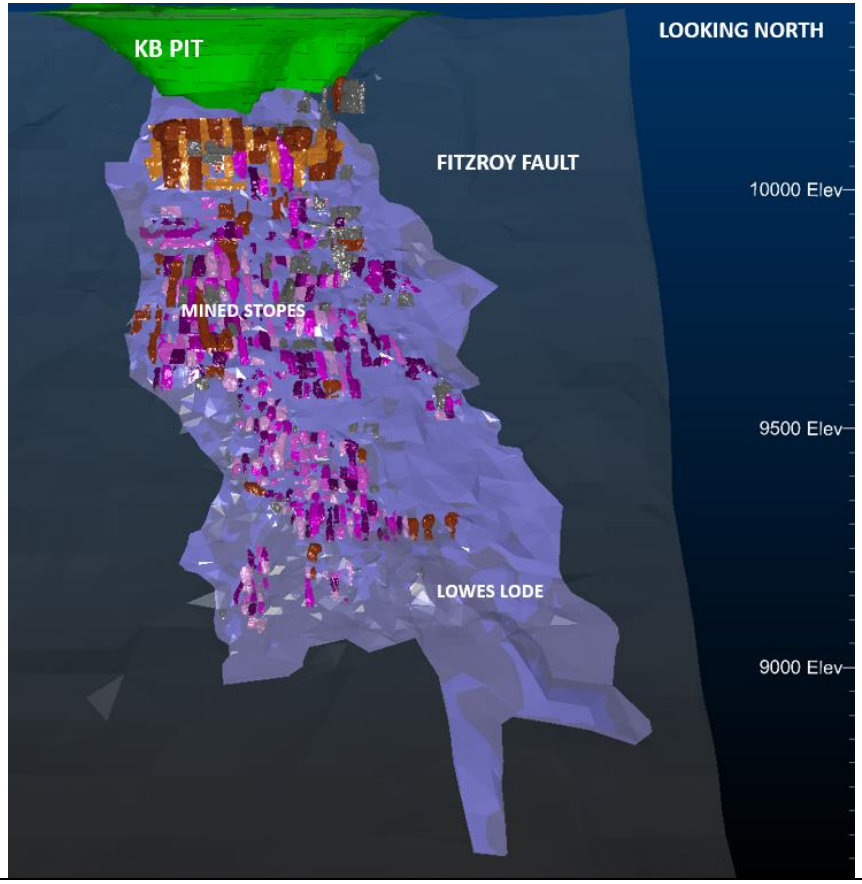
Criteria	JORC Code explanation	Commentary
	The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.	This Resource report relates to the entirety of the Kanowna Belle orebody. Each of the estimated lodes will show local variability even though the global estimate reflects the total average tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No reconciliation factors are applied to the Resource post-modelling.

KANOWNA BELLE PLAN & LONG SECTION DIAGRAMS

PLAN VIEW OF THE KANOWNA BELLE DEPOSIT

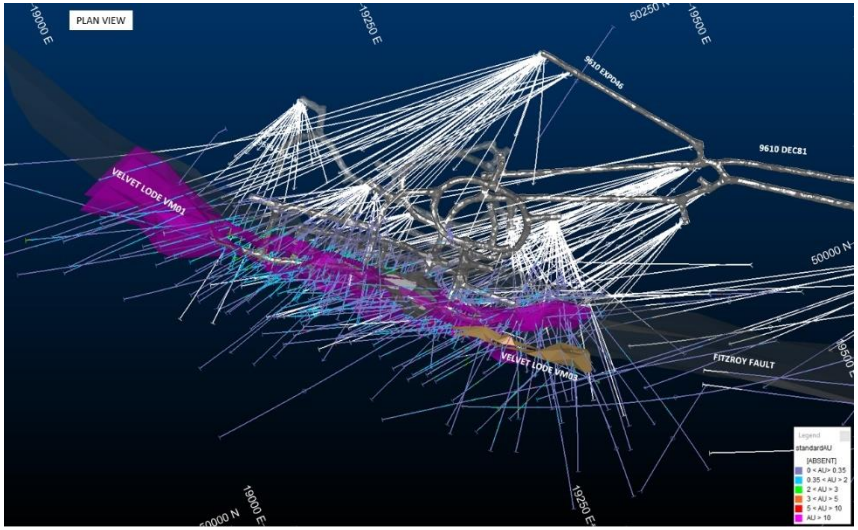


LONG SECTION OF THE KANOWNA BELLE DEPOSIT

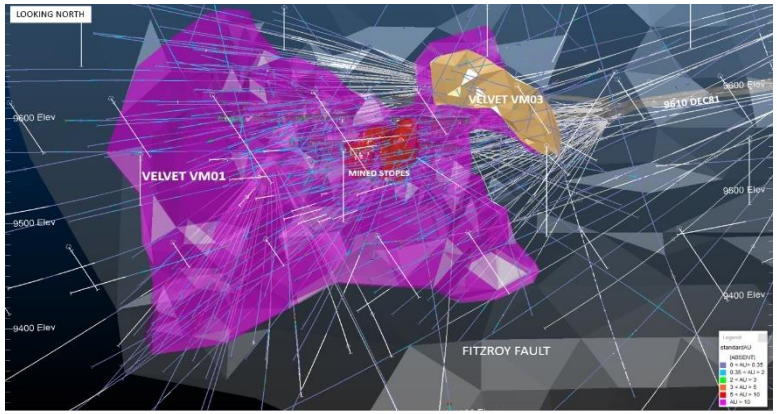


KANOWNA BELLE PLAN & LONG SECTION DIAGRAMS

PLAN VIEW OF THE VELVET DEPOSIT



LONG SECTION OF THE KANOWNA BELLE DEPOSIT



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Northern Star Resources Limited June 2017 Mineral Resource.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Competent Person is employed on a full-time basis by Northern Star Resources Limited. Regular site visits are undertaken year-round.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	A minimum Pre-Feasibility level study is completed prior to converting an ore zone into ore Reserve.
	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	Ore Reserves are re-optimised on a half yearly basis taking the most up to date model, gold price and cost forecasts into account. Underground:

Criteria	JORC Code explanation	Commentary
	have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.	The Ore Reserve methodology at Kanowna Belle is to complete a full mine design built from the latest block model using calculated cut-offs as a guide. Stopes are included or excluded from the ore Reserves based on the nominated COG for the mining area. A stope shape is designed around material at the COG and evaluated using the design software. Stope shapes of grade close to the COG are assessed using a more detailed financial evaluation to determine if they are to be included in Reserves. Design of stopes is also carried out below the COG to ensure that sensitivity results are meaningful. Mine planners are supplied with guidelines for blocking out stopes. These guidelines consider the effect of major structures and their impact on stoping designs. In general, the stope designs will not contain material below the block cut off unless there are reasonable grounds to mine that material. Exceptions to this include sub-economic material which is encapsulated by payable ore, or unavoidable extraction circumstances. The stope design shapes do not include dilution. Stope dilution is factored in numerically based on a large database of stope performance. The grade of dilution applied is a halo grade for individual stopes taken from the block model. All design work is carried out with the software Studio5D Planner. existing mine design provides the starting point for the Reserves. Planned stope geometry follows geotechnical design guidelines which have been in place for many years. The designs are evaluated for gold, sulphur and tonnes by Mineral Resource category bins. In this way, the Measured and Indicated portions of the design can easily be established. The evaluation results are automatically output to the scheduler software EPS. EPS is used as a flagging and calculation tool in the processing of ore Reserves. Factors for dilution and recovery are applied in EPS. All Stopes are run through a financial analysis to determine profitability. A coding system is used flag whether stopes are economic, uneconomic or excluded for Geological risk or Geotechnical reasons. Grade and Reserve code attributes are then attached to the ore Reserve wireframe. <u>Open Pit:</u> Ore Reserves have been calculated by generating detailed mining shapes for the proposed Kanowna Belle cutback. A series of nested optimised pit shells were generated using Whittle software, an analysis of the shells was completed to select one which was then used to complete a detailed pit design to closely resemble the selected whittle shell. The Whittle optimisation used parameters generated from NSR technical personnel and technical consultants. A detailed mine schedule and cost model has been generated using an excel spreadsheet model. Appropriate ore dilution and recoveries have been applied within the excel spreadsheet model.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	<u>Underground:</u> Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. • The assumed AUD gold price is $1,500/oz. • Mill recovery factors are based on test work and historical averages. Kanowna Belle operates at several horizons in the mine from as shallow as 170m down to over 1,200m of depth. With depth, come additional costs in terms of haulage and ground support. Consequently, several cut-off grades take this into account. Cut-off grades are applied on a block by block basis depending on the relative costs. <u>Open Pit:</u> The pit cut-off grade has been calculated based on the key input components (processing, recovery and administration). Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. • The AUD gold price as per corporate guidance. • Mill recovery factors are based on historical data and metallurgical test work. • Variable treatment costs to open pit mining for processing is a fundamental premise in the evaluation of open pit projects. Variable cut-off grade is used in the evaluation of open pit projects.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Mineral Resource is converted to Ore Reserve after completing a detailed mine design complete with a detailed financial assessment.

Criteria	JORC Code explanation	Commentary
		Open Pit: Ore Reserves have been calculated by generating detailed mining shapes for the proposed cutback. A series of nested optimised pit shells were generated using Whittle software, an analysis of the shells was completed to select one which was then used to complete a detailed pit design to closely resemble the selected whittle shell. The Whittle optimisation used parameters generated from NSR technical personnel and technical consultants.
	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.	Underground: Ore is mined from the stopes and tipped into an ore pass system before being loaded into haul trucks to bring to surface via the main decline. Stopes are nominally 30m by 20m by 20m in size. This may be increased or decreased depending on the local ground conditions. Once stopes are empty, if necessary they are filled with paste fill reticulated from a surface paste plant. Open Pit: The selected mining method for the Kanowna Belle cutback are of a bench mining open pit method. The proposed open pit cutback will be mined using conventional open pit mining methods (drill, blast, load and haul) by a mining contractor utilising 120 t class excavators and 90t trucks. This method is used widely in mines across Western Australia and is deemed appropriate given the mature of the ore body.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	The mine design takes geotechnical constraints into account and is reviewed by geotechnical engineers prior to being finalised. Underground operations at Kanowna Belle are impacted depth and seismic activity. Kanowna Belle has a relatively high in-situ stress field and a history of seismic events. Three-dimensional stress modelling is conducted on all mining areas in the lower mining horizons to determine mining sequence and extents. The environment is controlled by adherence to a geotechnically favourable extraction sequence and by the application of appropriate ground support. For the open pit design, historic geotechnical assessments and current wall angles were applied to the Whittle optimisation and subsequent detailed designs.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	This Table 1 applies to both underground and open pit mining. And detailed interface review was conducted to ensure separation between underground and open pit Reserve material.
	The mining dilution factors used.	Underground dilution factors are updated annually and are based on the historical performance of each mining block and evaluation of the geotechnical block model. Average stope dilution is currently 13%. An open pit mining dilution factor of 10% of zero grade has been applied for the reporting of Reserve physicals.
	The mining recovery factors used.	The underground recovery factor is reviewed and updated annually based on historical recovery at the site. Average stope recovery is currently 88%. An open pit mining recovery of 95% has been applied.
	Any minimum mining widths used.	Standard underground stope sizes are 15m along strike with a 30m level spacing. Minimum mining width of 4m is assumed. An open pit minimum mining width of 20m has been used for the pit design.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Designed underground stopes with greater than 50% inferred blocks are excluded from the reported Ore Reserve. For the open pit assessment, inferred material has not been included within this Reserve estimate (treated as waste) but has been considered in LOM planning. It is assumed that Inferred material will be converted to Reserve via grade control drilling which has been provided for and will be carried out ahead of mining. The LOM pit design contained 56% inferred material on an ounce basis.
	The infrastructure requirements of the selected mining methods.	The Kanowna Belle mine infrastructure is established and consist of offices, processing facility, workshop buildings, main access roads, communication networks, and pit access ramps to the current underground operation.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	The Kanowna Belle plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits. The milling facilities are designed to process approximately 1.8 million tonnes per annum. The plant has the capability to treat both refractory and free milling ores, through either a flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery) or bypassing the flotation circuit and going directly to a CIL

Criteria	JORC Code explanation	Commentary
		circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month. Ore Reserves are calculated using processing plant recovery factors that are based on test work and historical performance.
	Whether the metallurgical process is well-tested technology or novel in nature.	Standard extraction processes utilising the existing KB processing facility.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Based on metallurgical test work carried out and milling experience gained since 1993, 24 years' continuous operation
	Any assumptions or allowances made for deleterious elements.	No assumption made.
	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.	Milling experience gained since 1993, 24 years' continuous operation.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	The Kanowna Belle Mine is operated subject to the requirements of the Western Australian Mining Act 1978 and the Mines (Safety) Act, regulated by the Department of Minerals and Petroleum Resources (DMPR) Mines Inspectorate. The Mining Leases covering the Kanowna Belle operation stipulate environmental conditions for operation, rehabilitation and reporting. A "Licence to Operate" is held by the operation which is issued under the requirements of the "Environmental Protection Act 1986". Kanowna Belle is a prescribed premise requiring Department of Water and Environmental Regulation (DWER) licences to operate. It covers the following activities: • Crushing plant. • CIP process plant. • Sulphide concentrate roaster. • Tailings dam cells 1 and 2. • Calcine tails dam. • Wastewater treatment plant. • Arsenic waste stabilisation plant and disposal into underground workings. • Open cut and underground mines. • Paste backfill plant. • Batch plant. The key environmental areas covered in the licence are: • Air pollution and control conditions. • Water pollution control conditions. • Solid waste conditions. In late September 2001, DER approval was granted to commence on-site encapsulation and disposal of arsenic trioxide (As_2O_3). In accordance with the licence from the DER, the encapsulated blocks that are disposed of underground are enclosed in backfill generated from the plant tailings.
Infrastructure	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.	Access to the Kanowna Belle operation is provided by well-maintained public and private roads. Employees reside in Kalgoorlie and commute to site daily. Potable water for the Kanowna Belle operations is pumped from Kalgoorlie to a storage facility on site. Non-potable water requirements are sourced from bore fields up to 10 km away from the mine site. Makeup water for the Kanowna Belle process plant is supplied by pipeline from a bore field located in the Gidgi palaeochannel approximately 15 km from the plant site with some water is sourced from abandoned pits. Electricity is provided by the state electricity grid. A 15 km long 33 kV line from Kalgoorlie provides all electricity requirements of the operations. Sources of fuel, such as diesel, gasoline, propane, etc., are readily available at competitive pricing from local suppliers, as there are multiple operating plants in the Kalgoorlie area.

Criteria	JORC Code explanation	Commentary
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Underground capital costs are projected through an annual budget and Life of Mine planning process. Open pit costs are based on quotes supplied and have been included in the KB cutback economic cost model.
	The methodology used to estimate operating costs.	After a design is completed the mining sequence and processing sequence are scheduled. The schedules are costed in detail using a zero-based budgeting system.
	Allowances made for the content of deleterious elements.	No allowances made – none expected.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	The gold price is based on internal Corporate forecasts.
	The source of exchange rates used in the study.	Internal forecasts.
	Derivation of transportation charges.	Historic performance.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Historic performance.
	The allowances made for royalties payable, both Government and private.	State Govt. 2.5% royalty is built into the cost model
Revenue factors	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.	AUD $1,500/oz. gold price.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	It is assumed all gold is sold directly to market at the Corporate gold price guidance of AUD$1,500/oz.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not applicable.
	Price and volume forecasts and the basis for these forecasts.	Corporate guidance.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not applicable.
Economic	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.	NPV is used during Pre-Feasibility and Feasibility studies as required. Economic assumptions such as discount rate and estimated inflation are finalised at the time of the study.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities have been used with gold price ranges of A$1,300 to A$1,700 per ounce.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	
	Any identified material naturally occurring risks.	No issues.
	The status of material legal agreements and marketing arrangements.	No issues.
	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.	No issues.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	Resource classifications of Measured, Indicated and Inferred have been assigned based on data integrity, continuity of mineralisation and geology, drill density and the quality of the estimation (kriging efficiency). Reserve

Criteria	JORC Code explanation	Commentary
		classifications are derived from the underlying Resource model with Measure Resource converting to Proved and/or Probable Reserve, and Indicated converting to Probable Reserve.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results accurately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	Nil.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserves reporting processes has been subjected to an internal review by NSR Senior Technical personnel in July 2017.
Discussion of relative accuracy/ confidence	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.	Confidence in the model and Ore Reserve Estimate is considered high based on current mine and reconciliation performance.
	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.	Estimates are global but will be reasonable accurate on a local scale.
	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.	Not applicable.
	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.	Reconciliation results from past mining at Kanowna Belle has been considered and factored into the Ore Reserve assumptions where appropriate.

JORC Code, 2012 Edition – Table 1 Report
Barkers Underground Resource - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using a combination of Reverse Circulation (RC) and Diamond Drilling (DD). Face samples were taken underground at the heading using a rock pick. Diamond core was transferred to core trays for logging and sampling. Half core samples were nominated by the geologist and based upon geological and ore-zone boundaries, with the remaining sampled on metre intervals.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Diamond core was transferred to core trays for logging and sampling. Half core samples were nominated by the geologist from both NQ2 and HQ2 diamond core with a minimum sample width of either 20cm (HQ2) or 30cm (NQ2). RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. 4m composite spear samples were collected for each hole with 1m samples submitted for areas of known mineralisation or anomalism.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	RC drilling was used to drill seven pre-collars these ranged in depths from 40m-99m. RC samples were split using a rig-mounted cone splitter on one metre intervals to obtain a sample for assay. The RC drilling does not affect sampling of the Barkers Main Vein.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Both RC and Diamond Drilling techniques were used at the Barkers deposit. DD holes completed pre-2011 were predominantly NQ2 (50.5mm). All Resource definition holes completed post-2011 were drilled using HQ (63.5mm) diameter core. Core was orientated using the Reflex ACT Core orientation system. RC Drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. RC Pre-collar depth was restricted to 180m or less if approaching known mineralisation.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC drilling contractors adjust their drilling approach to specific conditions to maximise sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified during RC drilling. Recovery is often poor at the very beginning of each hole, as is normal for this type of drilling in overburden.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For diamond drilling, the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	Recovery is excellent for diamond core and no relationship between grade and recovery was observed. For RC drilling, pre-collars were ended before known zones of mineralisation and recovery was very good through any anomalous zones
Logging	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.	All diamond core is logged for regolith, lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	RC chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Resource definition DD drill core is cut and half the core is taken for sampling. The remaining half is stored for later use. Whole core sampling may be used for production and grade control drilling.

Criteria	JORC Code explanation	Commentary
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. These samples were submitted to the lab from any zones approaching known mineralisation and from any areas identified as having anomalous gold. Outside of mineralised zones spear samples were taken over a 4m interval for composite sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sample preparation is considered appropriate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Field duplicates were taken for RC samples at a rate of 1 in 20.
	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.	Exploration sample preparation was conducted at Genalysis Kalgoorlie. Resource Development sample preparation was conducted at Minanalytical Kalgoorlie. Both facilities undertake a similar process commencing with sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Samples are jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverised to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g pulp subsamples are then taken with an aluminium or plastic scoop and stored in labelled pulp packets.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50g fire assay charge is used with a lead flux in the furnace. The prill is totally digested by HCl and HNO_3 acids before Atomic Absorption Spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to test the analysis process. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples. This is random, except where high grade mineralisation is expected. Here, a Blank is inserted after the high grade sample to test for contamination. Failures above 0.2gpt are followed up, and re-assayed. New pulps are prepared if failures remain. Field duplicates are taken for all RC samples (1 in 20 sample). No field duplicates are submitted for diamond core. Regular audits of laboratory facilities are undertaken by Northern Star personnel.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent Person to be signed off.
	The use of twinned holes.	No twinned holes were drilled for this data set
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging is directly entered into an Acquire database. Assay files are received in csv format and loaded directly into the database by the project's responsible geologist with an Acquire importer object. Hardcopy and electronic copies of these are stored.
	Discuss any adjustment to assay data.	No adjustments are made to this assay data.
Location of data points	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.	A planned hole is pegged using a Differential GPS by the field assistants. The final collar is picked up after hole completion by Cardno Survey with a Differential GPS in the MGA 94_51 grid. During drilling, single-shot surveys are every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system which measures the gravitational dip and magnetic azimuth results are uploaded directly from the Reflex software export into the Acquire database.
	Specification of the grid system used.	The final collar position for surface holes is measured after hole completion by Differential GPS in the MGA94_51 grid.
	Quality and adequacy of topographic control.	The Differential GPS returns reliable elevation data which has been confirmed against a high resolution Digital Terrain Model survey performed by Arvista in 2015.

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing across the area varies. For the Resource definition drilling, spacing was typically 40m x 40m, to allow the Resource to be upgraded to indicated.
	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.	Resource definition drilling spacing was typically 40m x 40m, to allow the Resource to be upgraded to indicated. Surrounding exploration drilling can be spaced up to 200m apart.
	Whether sample compositing has been applied.	No compositing has been applied to these exploration results, although composite intersections are reported.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of the structures in the Kundana camp dip steeply (80°) to WSW. To target these orientations, the drill hole dips of 60-70° towards ~060° achieve high angle intersections on all structures.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits or reviews have recently been conducted on sampling techniques.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All holes mentioned in this report are located within Mining Lease M16/72 and M16/97 which is owned by Kundana Gold Pty Ltd, a wholly owned subsidiary of Northern Star Resources Limited. There are no private royalty agreements applicable to this tenement. The deposits lie within vacant crown land.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	All drilling and exploration of the Barkers Resource was conducted by previous owners of the tenements (including Pancontinental Gold, Aurion Gold, Placer Dome Inc, Barrick Gold) prior to the acquisition by Northern Star Resources.
Geology	Deposit type, geological setting and style of mineralisation.	The Kundana camp is situated within the Norseman-Wiluna Greenstone Belt, in an area dominated by major mineralised shear zones. Barkers-style mineralisation consists of narrow vein deposits (0.20m to 1.0m thick) hosted by shear zones located along steeply-dipping overturned lithological contacts. The footwall stratigraphy of Barkers consists of several different units of the Powder Sill Gabbro, a thick stratigraphy-parallel differentiated mafic intrusive. The volcanoclastic sedimentary rocks of the hanging-wall consist of a sequence of interbedded siltstones, felspathic sandstones, felspathic-lithic wackes and felspathic-lithic rhyolites.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth	All holes and relevant information for the estimation are too numerous to list. Face samples used in the estimate are also too numerous to list.

Criteria	JORC Code explanation	Commentary
	○ hole length.	
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Exploration results not reported in this release.
	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.	Exploration results not reported in this release.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	Exploration results not reported in this release.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	True widths have been calculated for intersections of the known ore zones based on existing knowledge of the nature of these structures.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Both the downhole width and true width have been clearly specified when used.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Downhole widths are reported.
Diagrams	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.	Appropriate plans and section have been included in this report.
Balanced reporting	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.	All valid drill holes within the estimated area have been reported with some holes in the area excluded. Holes were not excluded based on grade or width of the mineralised zone, only on the basis of confidence in the data. Excluded holes consist only of poorly geo-located holes as indicated by discontinuity the position of mineralisation or known geological contacts.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No other material has been collected.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further work will continue in 2017/2018 to extend the Indicated Resource deeper by additional drilling and identify new mineralised shoots on the K2 structure.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	See below.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

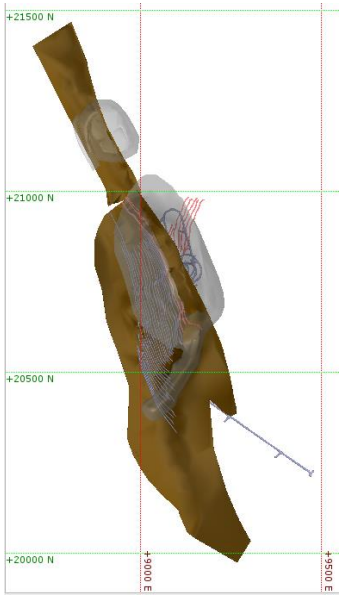
Criteria	JORC Code explanation	Commentary
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	Northern Star personnel have validated the database during the interpretation of the mineralisation, with any drill holes containing dubious data excluded from the MRE. Northern Star provided a list of holes to be excluded from the MRE and the reasons behind those exclusions.
	Data validation procedures used.	Data validation processes are in place and run upon import into the database to be used for the MRE in Datamine Studio RM v1.2 by Mining Plus.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person has visited site on numerous occasions. Although the Resource modellers (Mining Plus) did not complete a site visit, the estimate was based on interpretations from site personnel.
	If no site visits have been undertaken indicate why this is the case.	Not applicable
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The geological interpretation is considered robust due to the nature of the mineralisation and that portions of the deposit have been developed along and mined. The level plans and other maps have been used to guide the sub-domaining process.
	Nature of the data used and of any assumptions made.	Underground development mapping and sampling along with diamond drill core lithology, structure, alteration and mineralisation logs have been used to generate the mineralisation model. The primary assumption is that the mineralisation is hosted within structurally controlled quartz veins, which is considered robust.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	Due to the close spaced nature of the data from the historic mining and the consistency of the structure conveyed by this dataset, no alternative interpretations have been considered.
	The use of geology in guiding and controlling Mineral Resource estimation.	The mineralisation interpretation is based on a combination of logged quartz percentage or structure and assays.
	The factors affecting continuity both of grade and geology.	The structure is considered to be continuous over the length of the deposit with either quartz or the controlling structure used to guide this interpretation. The grade continuity is not as consistent and as such, the mineralisation has been sub-domained based on consistent grade zones, with these sub-domains used as hard boundaries during the estimation.
Dimensions	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.	The Barkers deposit is hosted within the one mineralised structure which strikes NW to NNW over a length of 900 m and dips steeply to the W with the down-dip extents in excess of 1,100 m. The Barkers North deposit is separated from the Barkers Deposit by a late stage structure. The mineralisation for this portion of the deposit has been defined by drilling intercepts to be more than 500 m along strike (340°) with steeply W-dipping extents of 400 m. Internal HG shoots have been identified in the Barkers deposit with two main plunge orientations defined to date – the first being a steep north plunge as defined by both development mapping and sampling and drill hole intercepts and the second being a moderate to steep southerly plunge.
Estimation and modelling techniques	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.	Grade estimation of accumulated gold and true width has been completed using Ordinary Kriging (OK) deposit into 6 gold domains using Datamine Studio RM v1.2 software. Variogram orientations are largely controlled by the strike and dip of the mineralisation, with the plunge of the higher grade mineralisation evident in long section being effectively replicated during the continuity analysis. Variography has been leant to the Barkers North domain, which had too few intercept composites.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	This MRE represents an update following a drilling programme and re-interpretation and modelling work completed by Northern Star. A comparison to the previous MRE for the Barkers Deposit (excluding Barkers North which has not been re-estimated), completed in December 2016 shows that: The combined Indicated and Inferred Mineral Resource Inventory has increased from 542,000t @ 14.0gpt gold for 260,300 ounces in February 2017 to 596,900@ 14.0gpt gold for 268,200 ounces of gold in May 2017.
	The assumptions made regarding recovery of by-products.	No assumptions have been made regarding recovery of any by-products.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements have been considered and therefore estimated for this deposit.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The data spacing varies considerably within the deposit ranging from underground development samples taken approximately every 3 m along strike and at 25 m vertically spaced intervals to drill hole intercepts which varied from close spaced 20 m (along strike) to 25 m (down dip) spacings through to 75 m (along strike) to 100 m (down dip) spacings.

Criteria	JORC Code explanation	Commentary
		A seam model has been created which has been rotated into the strike of the mineralisation. Blocks are variable in the across-strike direction, 10m in the along strike direction and 10m in elevation. Pass 1 estimations have been undertaken using a minimum of 5 and a maximum of 15 samples into a search ellipse set below a quarter to a third of the variogram range for all domains, with a maximum of two samples from each drill hole allowed. Pass 2 estimations have been undertaken using a minimum of 3 and a maximum of 15 samples into a search ellipse set at the generally just below half of the variogram range for all domains with a maximum of two samples from each drill hole allowed. Pass 3 estimations have been undertaken using a minimum of 1 and a maximum of 15 samples into a search ellipse set just below the variogram range. The seam model and intercept composites have been flattened to a mid-easting location for the purposes of estimation.
	Any assumptions behind modelling of selective mining units.	No selective mining units are assumed in this estimate.
	Any assumptions about correlation between variables.	No other elements other than gold have been estimated.
	Description of how the geological interpretation was used to control the Resource estimates.	The mineralisation wireframes supplied by Northern Star have been sub-domained in consultation with Northern Star based on orientation and grade, with these sub-domains used to flag the drill hole intercepts in the database. These flagged intercepts have then been used to create intercept composites in Datamine Studio RM v1.2.
	Discussion of basis for using or not using grade cutting or capping.	The influence of extreme sample distribution outliers in the composited data has been reduced by top-cutting where required. The top-cut levels have been determined using a combination of histograms, log probability and mean variance plots. Top-cuts have been reviewed and applied for the grouped estimation domains. The application of the top-cuts has not resulted in a significant decrease in the mean grade from the un-cut to top-cut data.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Model validation has been carried out, including visual comparison between de-clustered composites and estimated blocks; check for negative or absent grades; statistical comparison against the input drill hole data and graphical plots.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	The tonnes have been estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	For Mineral Resources, the cut-off grade (COG) is generated using an A$1,750 gold price. Costs incorporated in the COG are built from first principals, based either on actual cost history or budgeted estimates. For Resources in active mine areas, a variable COG has been used for the Resource estimate. The Variable costing is defined as all directly incurred costs involved in the development and extraction of the ore panel (e.g., drill & blast, haulage, processing, refining and royalties on sales.). The variable COG does not include capital development or fixed costs (i.e., costs not directly associated with extraction, processing and selling gold) that would be absorbed by the existing Reserve base.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The interpretation of mineralisation is independent of mining considerations. After modelling, the software 'Mineable Shape Optimiser' is used to generate optimal mining shape based on a 2m minimum mining width, and variable costing Cut-off grade at the A$1,750 gold price. Any isolated MSO shapes unlikely to be economic are removed from the estimated Resource. The Resource reported is the Measured, Indicated & Inferred material within the MSO shape generated.
Metallurgical factors or assumptions	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.	No metallurgical or recovery assumptions have been made during the MRE. Historic production of Barkers ore in the 2000's demonstrates that the material is amenable to conventional CIL processing.
Environmental factors or assumptions	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 green fields project, may not always be well advanced, the status of early consideration of these potential environmental impacts	No environmental assumptions have been made during the MRE.

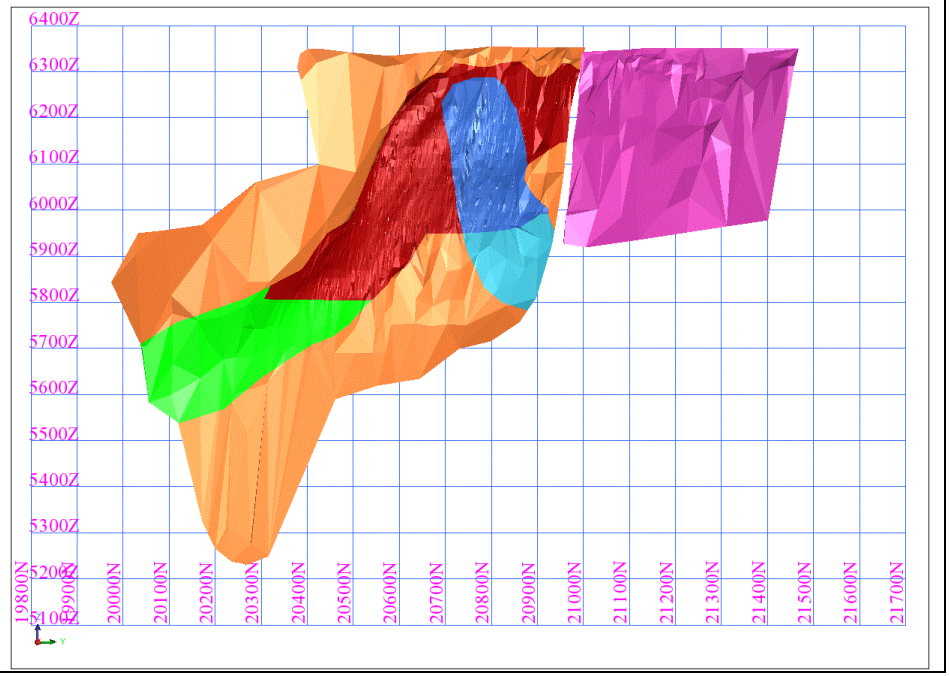
Criteria	JORC Code explanation	Commentary
	should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density values have been applied based on the degree of weathering which has been coded into the model. The values used have been obtained from a previous MRE for the Barkers Deposit.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	Bulk density vales have been derived through both surface sampling and comparison to tonnage estimates from material mined historically.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Densities were assigned based on weathering state (oxide, transitional and fresh rock) and domains.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	The Resource classification has been applied to the MR estimate based on the drilling data spacing, grade and geological continuity, and data integrity.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	The classification considers the relative contributions of geological and data quality and confidence, as well as grade confidence and continuity.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The classification reflects the view of the Competent Person.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Mineral Resource estimate for the combined Barkers deposit has not been audited by an external party.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC Code.
	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.	The statement relates to global estimates of tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No production records have been supplied as part of the scope of works, so no comparison or reconciliation has been made.

BARKERS PLAN & LONG SECTION DIAGRAMS

PLAN VIEW OF THE BARKERS DEPOSIT



LONG SECTION OF BARKERS DEPOSIT



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Northern Star Resources Limited June 2017 Mineral Resource.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person has conducted multiple sites visits, and has been involved in the operation from feasibility study to mine development.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	A minimum Pre-Feasibility level study has been completed.
	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	Upgrade of previous Ore Reserve.

Criteria	JORC Code explanation	Commentary
	have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.	
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. The assumed AUD gold price is at a conservative assumption of $1,500/oz. Mill recovery factors are based on test work and historical averages from the region. Various cut-off grades are calculated including a fully costed cut-off grade (COG), variable cut-off grade (VCOG) and Mill cut-off grade (MCOG). The VCOG is used as the basis for stope design, though any areas which are marginal or require significant development are assessed by a more detailed financial analysis to confirm their profitability.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Indicated Resources were converted to Probable Ore Reserves subject to mine design physicals and an economic evaluation. Stockpiled material was considered as Proved Reserve.
	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.	Ore is accessed from a decline located in the hangingwall through levels at 20m vertical spacing. A bottom up CRF fill mining method is applied and the levels are broken in to selectively sized stoping blocks to maximise production. The selected mining method was evaluated during the initial Pre-Feasibility study and was deemed the most appropriate. The mining method is similarly used at Northern Star for areas of the nearby Pegasus mine.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	The mine design considers well established geotechnical constraints and is reviewed by geotechnical engineers prior to being finalised. Independent geotechnical reviews were conducted for the Barkers and Strzelecki mines to provide guidance on pillar locations and extraction sequences. Historical geological and geotechnical information is gathered from the nearby operations that operated previously, including Barkers, Strzelecki and Centenary, and still in operation, Raleigh, Rubicon, Hornet and Pegasus, and learnings from this are applied to the geotechnical parameters used. Grade control is carried out through Resource definition drilling and face sampling of all ore drives.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	This Table 1 applies to underground mining only.
	The mining dilution factors used.	5% dilution is applied to CRF filled stopes to account for CRF dilution on the stopes. 10% dilution is applied to unfilled up hole stopes.
	The mining recovery factors used.	95% recovery is applied to CRF filled stopes. A calculated 74% recovery is applied to unfilled up hole stopes to account for pillar requirements.
	Any minimum mining widths used.	A minimum stope mining width of 2m has been used. This considers a minimum stope width of 2m +0.4m dilution in the Hangingwall and +0.4m dilution in the Footwall.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Designed stopes with greater than 50% inferred blocks are excluded from the reported Ore Reserve. No ounces have been included from Inferred material.
	The infrastructure requirements of the selected mining methods.	Remaining Site surface infrastructure requirements for the mining method include: CRF Batch Plants for Barkers All other surface infrastructure was completed in FY16-17. Underground infrastructure requirements include • Ventilation rises for Pope John and Moonbeam, and ventilation extensions on Millennium; • Primary ventilation fans for Pope John and Strzelecki; • Escapeway systems and extensions for Millennium and Pope John; • Power and pumping infrastructure with mine extension; • Historical void dewatering infrastructure; and, • Underground Magazines. All other underground infrastructure was completed in FY16-17.

Criteria	JORC Code explanation	Commentary
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	All Kundana ore is treated at the Kanowna Belle milling facilities. The plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits. These facilities are designed to handle approximately 1.8 million tonnes of feed per annum. The plant has the capability to treat both refractory and free milling ores, through either using the flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery), or bypassing the flotation circuit and going directly to a CIL circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month.
	Whether the metallurgical process is well-tested technology or novel in nature.	Plus 10 years milling experience with Kundana ores.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Plus 10 years milling experience with Kundana ores.
	Any assumptions or allowances made for deleterious elements.	No assumptions made.
	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.	Plus 10 years milling experience with Kundana ores.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	Millennium, Centenary and Pope John are currently compliant with all legal and regulatory requirements. All government permits and licenses and statutory approvals are either granted or in the process of being granted. Operational expansions to Moonbeam, Barkers, and Strzelecki would be subject to new / amended applications. Based on the locations of these operations and considering historical activities, the Competent Person does not view this as presenting significant risk to the extraction of these ore bodies.
Infrastructure	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.	All current site infrastructure is suitable to the proposed mining plan.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Mine development capital cost based on historical performance on site and life-of-mine forward planning. Plant and equipment capital also based on site experience and the LOM plan.
	The methodology used to estimate operating costs.	All overhead costs and operational costs are projected forward on an AUD $/t based on historical data.
	Allowances made for the content of deleterious elements.	No allowances made.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of AUD $1,500/oz., 2.5% WA state Government Royalty, as per NSR corporate guidance.
	The source of exchange rates used in the study.	All rates considered in Australian Dollars (AUD) as per NSR corporate guidance.
	Derivation of transportation charges.	Historic performance.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Historic performance.
	The allowances made for royalties payable, both Government and private.	All State Govt. and third party royalties are built into the cost model.
Revenue factors	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.	All revenue based on a gold price of AUD $1,500/oz.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	All product is sold direct at spot market prices.

Criteria	JORC Code explanation	Commentary
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not relevant for gold.
	Price and volume forecasts and the basis for these forecasts.	Not relevant for gold.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not relevant for gold.
Economic	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.	All costs assumptions are made based on historical performance from the mine and current economic forecast seen as representative of current market conditions.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities assessed at varying gold prices.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	No issues foreseen.
	Any identified material naturally occurring risks.	No issues foreseen.
	The status of material legal agreements and marketing arrangements.	No issues foreseen.
	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.	No issues foreseen.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves include Proved (if any) and Probable classifications. These classifications are based on Mineral Resource classifications as modified by subsequent grade control drilling and face sampling results.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	None.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	This ore Reserve has been prepared and peer reviewed internally within Northern Star Resources. There have been no external reviews of this Ore Reserve estimate.
Discussion of relative accuracy/ confidence	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.	Confidence in the model and Ore Reserve is considered high based on nearby Northern Star operated mines along the same ore bearing structures.
	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.	Ore Reserves are best reflected as global estimates.
	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.	Other than dilution and recovery factors described above, no additional modifying factors applied. There is high confidence in these models as the areas is well known and well drilled.
	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.	Reconciliation results from past mining at Centenary, Millennium, Barkers and Strzelecki reflect estimates in the Ore Reserve estimates. Production data for Pope John is not yet available as of 30th June 2017.

JORC Code, 2012 Edition – Table 1 Report
K2 Millennium-Centenary Deposit - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using a combination of Reverse circulation (RC) and diamond Drilling (DD). RC drilling was used to drill pre-collars for many of the Resource definition holes. Diamond drilling constitutes the rest of the drilling, including underground.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. These 1m samples were immediately submitted for assay in prospective zones of the drill hole. Composite spear samples were collected for less prospective zones of each hole, with the one metre samples retained in case those composite samples return unexpected mineralisation. Diamond drilling is sampled within geological boundaries with a minimum sample length. Face channel sampling is constrained within geological and mineralised boundaries.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Diamond core was transferred to core trays for logging and sampling. Core samples were nominated by the geologist from the diamond core, generally being around one metre in length, but with sample widths ranging between approximately 20cm and 130cm as dictated by the geology. Sample lengths varied because drill core samples were allocated so as not to cross significant geological boundaries. Samples were taken to a commercial laboratory for preparation by drying, crushing to <3mm, and pulverizing the entire sample to <75µm. 300g Pulps splits were then processed 50g Fire assay charge and AAS analysis.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Both RC and DD techniques were used on the K2 deposit. Core was orientated using the Reflex ACT Core orientation system. RC drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. Diamond drill holes completed pre-2011 were predominantly NQ2 (50.5mm). All Resource definition holes completed post 2011 were drilled using HQ (63.5mm) diameter core.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Moisture content and sample recovery is recorded for each RC sample.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For diamond drilling the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor. RC drilling contractors adjust their drilling approach to specific conditions to maximize sample recovery. Moisture content and sample recovery is recorded for each RC sample. No significant recovery issues were identified during RC drilling. Recovery was poor at the very beginning of each hole, as is normal for this type of drilling in overburden.
	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.	Recovery was excellent for diamond core with no core loss in the major mineralised zones. For RC drilling, pre-collars were ended before known zones of mineralisation and recovery was very good through any anomalous zones.
Logging	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.	All diamond core is logged for regolith, lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones. RC sample chips are logged in 1m intervals. For the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	In all instances, the entire drill hole is logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Diamond core is typically cut and half the core is taken for sampling. Some full core has also been submitted. The remaining half is stored and catalogued.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. These samples were submitted to the lab from any zones approaching known mineralisation and from any areas identified as having

Criteria	JORC Code explanation	Commentary
		anomalous gold. Outside of mineralised zones spear samples were taken over a 4m interval for composite sampling. Samples are taken dry, moisture is recorded where samples become wet.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Sample preparation was conducted at commercial laboratories, commencing with sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Samples are jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverized to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g Pulp subsamples are then taken with an aluminium scoop and stored in labelled pulp packets.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Use of 1m samples from rig mounted cone splitter for any composite samples over 0.1gpt Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size. Duplicates, pulp duplicates and crush duplicates are also performed.
	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.	Field duplicates were taken for RC samples at a rate of 1 in 20. Duplicates are collected on channel samples.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50g Fire assay charge is used with a lead flux, dissolved in the furnace. The prill is totally digested by HCl and HNO3 acids before Atomic absorption spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples, this is random, except where high grade mineralisation is expected. Here, a Blank is inserted after the high grade sample to test for contamination. Failures above 0.2gpt are followed up. New pulps are prepared if failures remain. Field Duplicates are taken for all RC samples (1 in 20 sample). No Field duplicates are submitted for diamond core. Two mineralised zones with visible gold (CNDD14007 & CNDD14008) were sent for 1 kg screen fire assay in addition to the standard 50g fire assay. Individual 50g fire assays were around 20% different (positive and negative) from the screen fire results resulting in composite intervals both having the 50g fire assay 11% higher than the 50g screen fire result. This result suggests that coarse gold is not a significant problem and that the 50g fire assay method is appropriate for this mineralisation.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent person to be signed off.
	The use of twinned holes.	No Twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging is directly entered into an Acquire database. Assay files are received in csv format and loaded directly into the database by the project's responsible geologists with an Acquire importer object. Hardcopy and electronic copies of these are stored.
	Discuss any adjustment to assay data.	No adjustments are made to this assay data.
Location of data points	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.	A planned hole is pegged using a Differential GPS by the field assistants. The final surface collar is picked up after hole completion by a Differential GPS or RTK GPS in the MGA94_51 grid. Holes drill underground are picked up by underground surveyors in mine grid. During drilling single-shot surveys are taken a minimum of every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system which measures the gravitational dip and magnetic azimuth results are uploaded directly from the Reflex software export into the Acquire database. Where possible gyroscopic surveys were taken on all surface holes. For UG holes multi-shot surveys are taken every 9m when retreating out of the hole.

Criteria	JORC Code explanation	Commentary
	Specification of the grid system used.	Data is collected using both local mine grid and MGA94_51 as appropriate.
	Quality and adequacy of topographic control.	The Differential GPS returns reliable elevation data which has been confirmed against older (early 2000's) topographic surveys.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Resource definition drilling spacing is typically 40m x 40m. This allows the Resource to be upgraded to indicated. Inferred Resources typically have a spacing of 80m x 80m.
	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.	The data spacing and distribution is considered sufficient to support the Resource and Reserve estimates.
	Whether sample compositing has been applied.	Sample data is composited before grade estimation is undertaken. Statistical analysis was performed on the war samples to determine optimal composite lengths.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The targeted K2 structure in the area dips at 75° toward 230° (MGA94_51) All drilling was oriented as close to perpendicular as practical to this orientation.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No external audits or reviews have recently been conducted on sampling techniques.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All holes mentioned in this report are located within the M16/87, M16/72, M16/157 tenements, which are owned by Kundana Gold Pty Ltd, a wholly owned subsidiary of Northern Star Resources. There are no private royalty agreements applicable to this tenement.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The area of interest for this drilling is contiguous with the Centenary underground mine and South Pit open cut mine. Drilling of these projects adds gold grade and geological context information to the interpretation of the area tested.
Geology	Deposit type, geological setting and style of mineralisation.	The Kundana camp is situated within the Norseman-Wiluna Greenstone Belt, in an area dominated by the Zuleika shear zone, which separates the Coolgardie domain from the Ora Banda domain. K2-style mineralisation consists of narrow vein deposits hosted by shear zones located along steeply-dipping overturned lithological contacts. The K2 structure is present along the contact between a black shale unit (Centenary shale) and intermediate volcaniclastics (Spargoville formation). Early indications from the diamond drilling of this report indicate a late generation of shearing overprinting and largely focussed along the earlier K2 structure. At this stage, it is unclear if this later generation of shearing is associated with an additional mineralising event.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole	Too many holes to practically list the complete dataset, the long section and plan reflect the hole positions used for previous estimation stated.

Criteria	JORC Code explanation	Commentary
	collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	All reported assay results have been length weighted to provide an intersection width. Barren material between mineralised samples has been permitted in the calculation of these widths where the resultant average composite grade of samples beyond (and not including) the core mineralised zone exceeds the 1 gpt cut-off grade used for intercept calculation.
	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.	Where an intersection incorporates short lengths of high grade results these intersections will be reported in addition to the aggregate value. These will typically take the form of ##.#m @ ##.##gpt including ##.#m @ ##.##gpt.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values have been used for the reporting of these exploration results.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	True widths have been calculated for intersections of the known ore zones, based on existing knowledge of the nature of these structures.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	The target structure is very planar and its orientation well constrained, allowing very reliable calculations of true widths. True widths have been calculated for all reported intersections.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Both the downhole width and true width have been clearly specified when used.
Diagrams	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.	Appropriate plans and section have been included in this release.
Balanced reporting	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.	Both high and low grades have been reported accurately, clearly identified with the drill hole attributes and 'From' and 'To' depths. All target zone intercepts for all eight holes have been reported for this drill program regardless of grade
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No other material data has been collected.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Additional drilling is planned with the intention of extending known mineralisation along strike and at depth. Drilling will also be undertaken to improve confidence in previously identified mineralisation and to assist in the location of high grade shoots.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Appropriate diagrams accompany this release.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

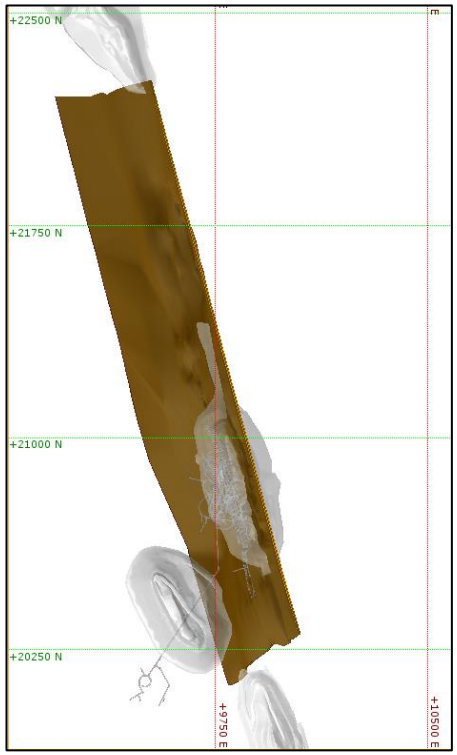
Criteria	JORC Code explanation	Commentary
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	Sampling and logging data is either recorded on paper and manually entered into a database system, or is captured digitally via a logging laptop and directly loaded into the database system. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly into the database from laboratory and survey derived files.
	Data validation procedures used.	Random checks through use of the data and data validation procedure prior to Resource estimation.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The geological interpretations underpinning these Resource models were prepared by geologists working in the mine and in direct, daily contact with the ore body. The estimation of grades was undertaken by personnel familiar with the particular ore body and the general style of mineralisation encountered.
	If no site visits have been undertaken indicate why this is the case.	Multiple site visits undertaken by Geologists supervising the drilling programs and preparing the Geological interpretation.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource. The confidence in the geological interpretation is high and is supported with information acquired during ore development as well as from drilling.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drill holes and structural models.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed.
	The use of geology in guiding and controlling Mineral Resource estimation.	The interpretation of the main K2 structure is based on the presence of Quartz veining and continuity between sections on the K2 structure. The Yellow Bird Fault's apparent position was used to subdivide the K2 hosted mineralisation into narrow, high grade style mineralisation in the Centenary area from the wider/lower grade mineralisation in the Millennium area. Drill core logging and face development mapping is used to create 3D constraining wireframes.
	The factors affecting continuity both of grade and geology.	Continuity is affected by the orientation of the K2 structure, and several dextral offset fault structures.
Dimensions	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.	The strike length of the different ore systems varies from around 100m to 1000m. The individual ore bodies occur in a major regional shear system extending over 10s of kilometres. Ore body widths are typically in the range of 1 - 2m Mineralisation is known to occur from the base of cover to 1000m below surface.
Estimation and modelling techniques	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.	High and low grade subdomains were used within the estimation. All grade values were estimated using Ordinary Kriging. A three-dimensional, non-rotated block volume model was created for use in grade estimation and sized to encompass the entire mineralised area of the deposit. A waste background domain was constructed to surround the mineralised domains with enough material for dilution and mining studies. Search distances used for estimation based on variogram ranges and vary by domain. Extensive use of computer software was made during the estimation process. The principal packages used included Datamine Studio RM, Surpac, Vulcan, Supervisor and Isatis.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Most deposits in the Kundana area have a history of prior production. Previously mined areas can be estimated and the results obtained compared with production records. Ongoing monitoring of the performance of the Resource models is undertaken through the production reporting system.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The selection of block sizes considered the geometry of the domains to be modelled, the local drill hole spacing and the strike and dip of the domains. The narrow lode domains had parent cell dimensions set to 10x10m in the northing and elevation directions and an infinitely variable width in the easting direction, to allow for accurate definition of the

Criteria	JORC Code explanation	Commentary
		variable horizontal width in each lode domain at the cell centroid. The narrow halo domain used similarly sized parent cells but easting and northing set to 10m and the elevation direction reduced to 5m. The open background domain used dimensions of 20m x20m and 10m in elevation. Sub cell splitting was allowed in all cases. Search ellipse dimensions were derived from the variogram model ranges and octant declustering was used to ensure that as much as possible the composites selected for use were evenly distributed around the cell to be estimated.
	Any assumptions behind modelling of selective mining units.	Selective mining units were not used during the estimation process. A minimum mining width was used when selecting material for inclusion in Resource tabulations.
	Any assumptions about correlation between variables.	All variables were estimated independently of each other.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralised domains are defined using a pair of wireframes surfaces representing the hanging wall and footwall of the domain. The surfaces are created from manually selected drill intersections. During core logging the occurrence of important structures is recorded in the geological database. When the interpretation is undertaken the start and end points of the flagged intervals are used to create the hanging wall and foot wall surface wireframes.
	Discussion of basis for using or not using grade cutting or capping.	Top-cuts were applied to the composited sample data with the intention of reducing the impact of outlier values on the average grade. Top cuts were selected based on a statistical analysis of the data with a general aim of not impacting the mean by more than 5% and vary by domain (ranging from 1 to 400gpt for individual domains and deposits)
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Validation is comprised of a statistical analysis of grade estimates and comparison with composite statistics. The estimated top cut Au grade was also compared with the back calculated Au grade in the lode domains. Visually, block grades are assessed against drill hole and face data.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	For Mineral Resources, the cut-off grade (COG) is generated using an A$1,750 gold price. Costs incorporated in the COG are built from first principals, based either on actual cost history or budgeted estimates. For Resources in active mine areas, a variable COG has been used for the Resource estimate. The Variable costing is defined as all directly incurred costs involved in the development and extraction of the ore panel (e.g., drill & blast, haulage, processing, refining and royalties on sales.). The variable COG does not include capital development or fixed costs (i.e., costs not directly associated with extraction, processing and selling gold) that would be absorbed by the existing Reserve base.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The interpretation of mineralisation is independent of mining considerations. After modelling, the software 'Mineable Shape Optimiser' is used to generate optimal mining shape based on a 2m minimum mining width, and variable costing Cut-off grade at the A$1,750 gold price. Any isolated MSO shapes unlikely to be economic are removed from the estimated Resource. The Resource reported is the Measured, Indicated & Inferred material within the MSO shape generated.
Metallurgical factors or assumptions	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.	Metallurgical test work results show that the mineralisation is amendable to processing through the Kanowna Belle treatment plant. Ore processing throughput and recovery parameters were estimated based on historic performance and potential improvements available using current technologies and practices.
Environmental factors or assumptions	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 green fields 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.	A "Licence to Operate" is held by the operation which is issued under the requirement of the "Environmental Protection Act 1986", administered by the Department of Environment (DoE). The licence stipulates environmental conditions for the control of air quality, solid waste management, water quality, and general conditions for operation. Groundwater licenses are held for water abstraction, including production bore field water use for mineral processing, and mine dewatering, in accordance with the Rights in Water and Irrigation Act 1914. These licenses are also regulated by DoE and are renewable on a regular basis. Kanowna Operations conduct extensive environmental monitoring and management programs to ensure compliance with the requirements of the licences and lease conditions. An

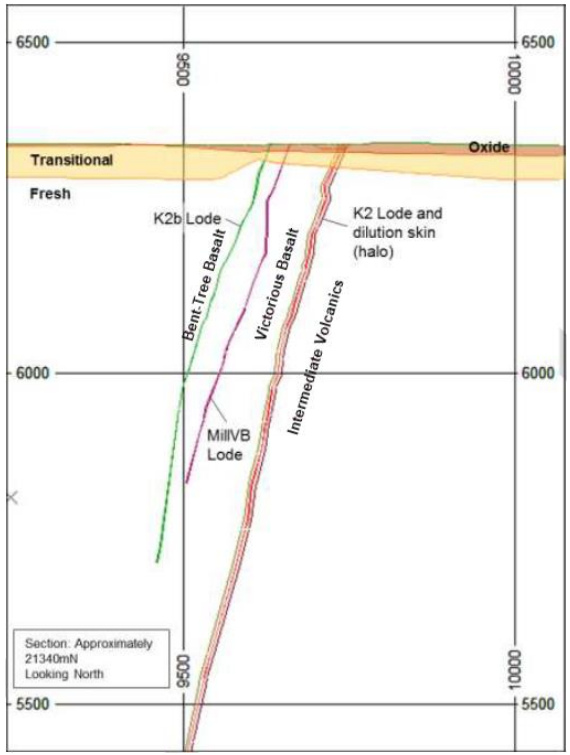
Criteria	JORC Code explanation	Commentary
		Environmental Management System is in place to ensure that Northern Star employees and contractors exceed environmental compliance requirements. The Kalgoorlie operations are fully permitted including groundwater extraction and dewatering, removal of vegetation, mineral processing, and open pits. Kalgoorlie Operations have been compliant with the International Cyanide Management Code since 2008. Compliance with air quality permits is particularly important at Kanowna because of the roaster operation and because there are three facilities in the Kalgoorlie region emitting SO_2 gas. Kanowna has a management program in place to minimize the impact of SO_2 on regional air quality, and ensure compliance with regulatory limits.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density was determined from surface diamond drill holes with intervals taken from mineralized and non-mineralised zones within the project area. The bulk densities are derived from wet and dry weighting of core no greater than 30cm total length, with core samples selected by changes in lithology/alteration or every 30-40m where no change is evident.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones and underground environment.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities are applied to domains for the ore zone, footwall and hangingwall as constrained by the lode wireframes.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on a series of factors including: Geologic grade continuity; Density of available drilling; Statistical evaluation of the quality of the kriging estimate.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	All relevant factors have been given due weighting during the classification process.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The Resource model methodology is considered to be appropriate and the estimated grades to reflect the Competent Persons view of the deposit.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	All Resource models have been subjected to internal peer reviews.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	These mineral Resource estimates are considered as robust and representative of the Kundana style of mineralisation. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource.
	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.	This Resource report relates to the entirety of the K2 ore zone and surrounding dilution skins. Each of these will show local variability even though the global estimate reflects the total average tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No reconciliation factors are applied to the Resource post-modelling.

MILLENNIUM – CENTENARY REPRESENTATIVE PLAN AND CROSS SECTION DIAGRAMS

Plan view of the Millennium-Centennary Resource and nearby infrastrucutre



Cross Section of the Millennium / Centenary Deposits



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Northern Star Resources Limited June 2017 Mineral Resource.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person has conducted multiple sites visits, and has been involved in the operation from feasibility study to mine development.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	A minimum Pre-Feasibility level study has been completed.
	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.	Upgrade of previous Ore Reserve.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. The assumed AUD gold price is at a conservative assumption of $1,500/oz. Mill recovery factors are based on test work and historical averages from the region. Various cut-off grades are calculated including a fully costed cut-off grade (COG), variable cut-off grade (VCOG) and Mill cut-off grade (MCOG). The VCOG is used as the basis for stope design, though any areas which are marginal or require significant development are assessed by a more detailed financial analysis to confirm their profitability.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Indicated Resources were converted to Probable Ore Reserves subject to mine design physicals and an economic evaluation. Stockpiled material was considered as Proved Reserve.
	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.	Ore is accessed from a decline located in the hangingwall through levels at 20m vertical spacing. A bottom up CRF fill mining method is applied and the levels are broken in to selectively sized stoping blocks to maximise production. The selected mining method was evaluated during the initial Pre-Feasibility study and was deemed the most appropriate. The mining method is similarly used at Northern Star for areas of the nearby Pegasus mine.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	The mine design considers well established geotechnical constraints and is reviewed by geotechnical engineers prior to being finalised. Independent geotechnical reviews were conducted for the Barkers and Strzelecki mines to provide guidance on pillar locations and extraction sequences. Historical geological and geotechnical information is gathered from the nearby operations that operated previously, including Barkers, Strzelecki and Centenary, and still in operation, Raleigh, Rubicon, Hornet and Pegasus, and learnings from this are applied to the geotechnical parameters used. Grade control is carried out through Resource definition drilling and face sampling of all ore drives.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	This Table 1 applies to underground mining only.
	The mining dilution factors used.	5% dilution is applied to CRF filled stopes to account for CRF dilution on the stopes 10% dilution is applied to unfilled up hole stopes.
	The mining recovery factors used.	95% recovery is applied to CRF filled stopes. A calculated 74% recovery is applied to unfilled up hole stopes to account for pillar requirements.

Criteria	JORC Code explanation	Commentary
	Any minimum mining widths used.	A minimum stope mining width of 2m has been used. This considers a minimum stope width of 2m +0.4m dilution in the Hangingwall and +0.4m dilution in the Footwall.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Designed stopes with greater than 50% inferred blocks are excluded from the reported Ore Reserve. No ounces have been included from Inferred material.
	The infrastructure requirements of the selected mining methods.	Remaining Site surface infrastructure requirements for the mining method include: • CRF Batch Plants for Millennium, Pope John, Barkers, and Strzelecki; • Pope John Pit dewatering system; • Moonbeam power infrastructure; • Moonbeam pit portal access; All other surface infrastructure was completed in FY16-17. Underground infrastructure requirements include • Ventilation rises for Pope John and Moonbeam, and ventilation extensions on Millennium; • Primary ventilation fans for Pope John and Strzelecki; • Escapeway systems and extensions for Millennium and Pope John; • Power and pumping infrastructure with mine extension; • Historical void dewatering infrastructure; and, • Underground Magazines. All other underground infrastructure was completed in FY16-17.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	All Kundana ore is treated at the Kanowna Belle milling facilities. The plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits. These facilities are designed to handle approximately 1.8 million tonnes of feed per annum. The plant has the capability to treat both refractory and free milling ores, through either using the flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery), or bypassing the flotation circuit and going directly to a CIL circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month.
	Whether the metallurgical process is well-tested technology or novel in nature.	Plus 10 years milling experience with Kundana ores.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Plus 10 years milling experience with Kundana ores.
	Any assumptions or allowances made for deleterious elements.	No assumptions made.
	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.	Plus 10 years milling experience with Kundana ores.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	Millennium, Centenary and Pope John are currently compliant with all legal and regulatory requirements. All government permits and licenses and statutory approvals are either granted or in the process of being granted. Operational expansions to Moonbeam, Barkers, and Strzelecki would be subject to new / amended applications. Based on the locations of these operations and considering historical activities, the Competent Person does not view this as presenting significant risk to the extraction of these ore bodies.
Infrastructure	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.	All current site infrastructure is suitable to the proposed mining plan.

Criteria	JORC Code explanation	Commentary
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Mine development capital cost based on historical performance on site and life-of-mine forward planning. Plant and equipment capital also based on site experience and the LOM plan.
	The methodology used to estimate operating costs.	All overhead costs and operational costs are projected forward on an AUD $/t based on historical data.
	Allowances made for the content of deleterious elements.	No allowances made.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of AUD $1,500/oz., 2.5% WA state Government Royalty, as per NSR corporate guidance.
	The source of exchange rates used in the study.	All rates considered in Australian Dollars (AUD) as per NSR corporate guidance.
	Derivation of transportation charges.	Historic performance.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Historic performance.
	The allowances made for royalties payable, both Government and private.	All State Govt. and third party royalties are built into the cost model.
Revenue factors	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.	All revenue based on a gold price of AUD $1,500/oz.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	All product is sold direct at spot market prices.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not relevant for gold.
	Price and volume forecasts and the basis for these forecasts.	Not relevant for gold.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not relevant for gold.
Economic	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.	All costs assumptions are made based on historical performance from the mine and current economic forecast seen as representative of current market conditions.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities assessed at varying gold prices.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	No issues foreseen.
	Any identified material naturally occurring risks.	No issues foreseen.
	The status of material legal agreements and marketing arrangements.	No issues foreseen.
	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.	No issues foreseen.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves include Proved (if any) and Probable classifications. These classifications are based on Mineral Resource classifications as modified by subsequent grade control drilling and face sampling results.

Criteria	JORC Code explanation	Commentary
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	None.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	This ore Reserve has been prepared and peer reviewed internally within Northern Star Resources. There have been no external reviews of this Ore Reserve estimate.
Discussion of relative accuracy/ confidence	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.	Confidence in the model and Ore Reserve is considered high based on nearby Northern Star operated mines along the same ore bearing structures.
	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.	Ore Reserves are best reflected as global estimates.
	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.	Other than dilution and recovery factors described above, no additional modifying factors applied. There is high confidence in these models as the areas is well known and well drilled.
	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.	Reconciliation results from past mining at Centenary, Millennium, Barkers and Strzelecki reflect estimates in the Ore Reserve estimates. Production data for Pope John is not yet available as of 30th June 2017.

JORC Code, 2012 Edition – Table 1 Report
K2 Drake – Moonbeam Deposit - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using a combination of Reverse Circulation (RC) and Diamond Drilling (DD). RC drilling was used to drill pre-collars for many of the holes with diamond tails. Diamond drilling constitutes the rest of the drilling.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Diamond core was transferred to core trays for logging and sampling. Half core samples were nominated by the geologist from both NQ2 and HQ diamond core with a minimum sample width of either 20cm (HQ) or 30cm (NQ2). RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. 4m composite spear samples were collected for each hole with 1m samples submitted for areas of known mineralisation or anomalism.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Prior to Northern Star Resources, samples were taken to multiple labs in Western Australia for preparation by drying, crushing, pulverising and analysis to industry standards. After Northern Star ownership samples were taken to Genalysis Kalgoorlie for preparation by drying, crushing to <3mm, and pulverising the entire sample to <75µm. 300g Pulps splits were then dispatched to Genalysis Perth for 50g fire assay charge and AAS analysis.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Both RC and Diamond Drilling techniques were used at the K2 deposits. DD holes completed pre-2011 were predominantly NQ2 (50.5mm). All Resource definition holes completed post-2011 were drilled using HQ (63.5mm) diameter core. Core was orientated using the Reflex ACT Core orientation system. RC Drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. RC Pre-collar depth was restricted to 180m or less if approaching known mineralisation.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC drilling contractors adjust their drilling approach to specific conditions to maximise sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified during RC drilling. Recovery is often poor at the very beginning of each hole, as is normal for this type of drilling in overburden.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For diamond drilling, the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	Recovery is excellent for diamond core and no relationship between grade and recovery was observed. For RC drilling, pre-collars were ended before known zones of mineralisation and recovery was very good through any anomalous zones.
Logging	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.	All diamond core is logged to industry best standards for regolith, lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	RC chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Resource definition DD drill core is cut and half the core is taken for sampling. The remaining half is stored for later use.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Before Northern Star owner RC samples were collected to industry standards.

Criteria	JORC Code explanation	Commentary
		After Northern start ownership, all RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. These samples were submitted to the lab from any zones approaching known mineralisation and from any areas identified as having anomalous gold. Outside of mineralised zones spear samples were taken over a 4m interval for composite sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sample preparation is considered appropriate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Field duplicates were taken to industry standards at time of drilling
	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.	Before Northern Star Resources ownership, sample preparation was accepted to be to industry standards of the time. Exploration sample preparation after Northern Star ownership was conducted at Genalysis Kalgoorlie. This facility processed the samples which included sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Samples were jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverised to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g pulp subsamples are then taken with an aluminium scoop and stored in labelled pulp packets.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size. Prior to Northern Star ownership this process is assumed to have also happened.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50g fire assay charge is used with a lead flux in the furnace. The prill is totally digested by HCl and HNO_3 acids before Atomic Absorption Spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Before Northern Star Resources ownership, it is assumed Certified Reference Materials (CRMs) and blanks were inserted as per industry standards of the time. After Northern Star ownership CRMs were inserted into the sample sequence randomly at a rate of 1 per 20 samples to test the analysis process. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples. This is random, except where high grade mineralisation is expected. Here, a Blank is inserted after the high grade sample to test for contamination. Failures above 0.2gpt are followed up, and re-assayed. New pulps are prepared if failures remain. Field duplicates are taken for all RC samples (1 in 20 sample). No field duplicates are submitted for diamond core. Regular audits of laboratory facilities are undertaken by Northern Star personnel.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent Person to be signed off.
	The use of twinned holes.	No twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging was captured using excel templates. Both a hardcopy and electronic copy of these are stored, as well as being loaded in to the database using automatic acquire loaders. Assay files are received in csv format and loaded directly into the database by the Database administrator (DBA). A geologist then checks that the results have inserted correctly. Hardcopy and electronic copies of these are stored. No adjustments are made to this assay data.
	Discuss any adjustment to assay data.	
Location of data points	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.	Historical planned hole is pegged using industry best practices at the time. Later holes were pegged using a differential GPS system.

Criteria	JORC Code explanation	Commentary
		During drilling, single-shot surveys are every 30m to ensure the hole remains close to design (using different downhole surveying techniques). Upon hole completion, all Northern Star commissioned holes were Gyroscopic surveyed, taking survey readings every 5m for improved spatial accuracy in a true north grid. Previous to this final downhole surveys were conducted to industry standards.
	Specification of the grid system used.	The final collar position for surface holes is measured after hole completion by Differential GPS in the MGA 94_51 grid.
	Quality and adequacy of topographic control.	Quality topographic control has been achieved through Avista data and survey pickups of holes over the last 15 years.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing across the area varies and ranges from 40m x 40m in the upper zones to +100m x 100m.
	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.	The data spacing is considered appropriate to establish a degree of geological and/or statistical confidences for the application of Resource and Reserve classification.
	Whether sample compositing has been applied.	No compositing has been applied to these exploration results, although composite intersections are reported.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of the structures in the Kundana camp (including K2 and K2E) dip steeply (80°) to WSW. To target these orientations, the drill hole dips of 60-70° towards ~060° achieve high angle intersections on all structures.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails. Prior to Northern Star ownership, sample security assumed to be similar and adequate.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits or reviews have recently been conducted on sampling techniques.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	The Moonbeam Projects are held partly by the East Kundana Joint Venture (EKJV) on tenement M16/309 and partly on Mining Lease M16/157 which is owned 100% by Northern Star Resources. The EKJV is majority owned and managed by Northern Star Resources Limited (51%). The minority holding in the EKJV is held by Tribune Resources Ltd (36.75%) and Rand Mining Ltd (12.25%).
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The first reference to the mineralisation encountered at the Kundana project was a Mines Department report produced by Dr. I. Martin (1987). He reviewed work completed in 1983 – 1984 by a company called Southern Resources who identified two geochemical anomalies, creatively named Kundana #1 and Kundana #2. The Kundana #2 prospect was subdivided into a further two prospects, dubbed K2 and K2A. Between 1987 and 1997, limited work was completed. Between 1997 and 2006 Tern Resources (subsequently Rand Mining and Tribune Resources) and Gilt-Edged mining focused on shallow open pit potential which was not considered viable.
Geology	Deposit type, geological setting and style of mineralisation.	The Kundana camp is situated within the Norseman-Wiluna Greenstone Belt in an area dominated by the Zuleika Shear Zone, which separates the Coolgardie Domain from the Ora Banda Domain.

Criteria	JORC Code explanation	Commentary
		K2-style mineralisation consists of narrow vein deposits hosted by shear zones located along steeply-dipping overturned lithological contacts. The K2 structure is present along the contact between a black shale unit (Centenary shale) and intermediate volcanoclastics (Spargoville Formation). The K2E structure is present along the contact between the Victorious Basalt and Centenary shale
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically list the complete dataset for the Resources, the long section and plan reflect the hole positions used for previous estimation stated.
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No exploration results reported
	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.	No exploration results reported
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No exploration results reported
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No exploration results reported
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	No exploration results reported
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	No exploration results reported
Diagrams	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.	No exploration results reported
Balanced reporting	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.	No exploration results reported.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No exploration results reported.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Infill definition and extensional depth drilling is planned.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Representative plans and sections accompany this report.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

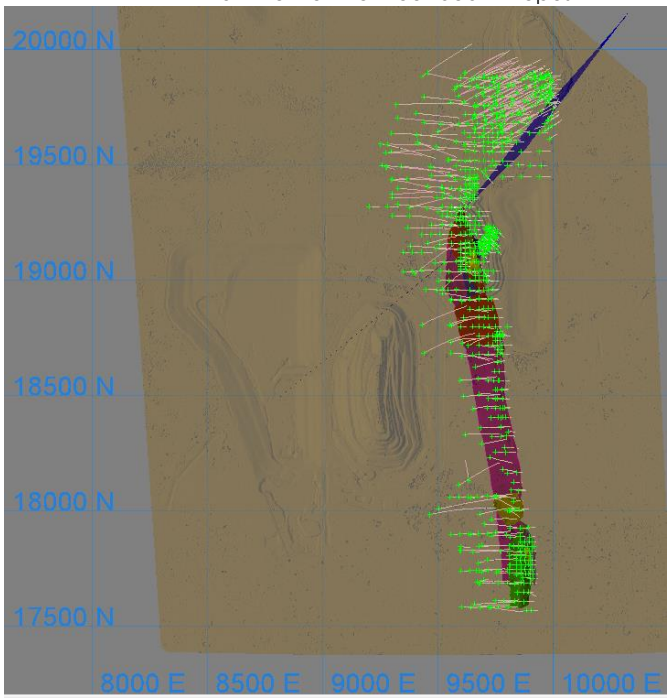
Criteria	JORC Code explanation	Commentary
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	Sampling and logging data is either recorded on paper and manually entered into to the Acquire database or directly transferred from a logging laptop over to the database. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly to the database from laboratory and survey derived files.
	Data validation procedures used.	Random checks through use of the data and data validation procedure prior to Resource estimation.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	This Resource estimate has been conducted by a senior geologist with previous experience this this type of mineralisation.
	If no site visits have been undertaken indicate why this is the case.	Site Visit undertaken
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource. The confidence in the geological interpretation is high with the information gained from ore development and underground drilling.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drill holes and structures.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed.
	The use of geology in guiding and controlling Mineral Resource estimation.	The interpretation of the main K2 and K2E structures is based on the presence of quartz veining and is relative position around the Centenary shale unit. Drill-hole logging data is used to create 3D constrained wireframes.
	The factors affecting continuity both of grade and geology.	Continuity is affected by the orientation of the K2 and K2E structures as well as the thickness of the Centenary shale unit. Termination of these structures is controlled by the Lucifer fault in the north.
Dimensions	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.	The dimensions for each deposit reported vary, however typically the following dimensions: Strike length = Up to 1,600m for each K2 shoot (K2 and K2E); Width = ~0.5-2m average, with widths up greater than 2m. Depth = from surface to ~500m maximum below surface.
Estimation and modelling techniques	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.	Ordinary Kriging (OK) was used to estimate this Resource, using Vulcan 9.1 software. Three separate domains were used to divided the main K2 and 3 separate domains divided the K2E. Oxide/Weathered zones were also subdivided and analysed as independently. Each domain is validated against the lithology, and then snapped to the drill-hole and face data to constrain the mineralised envelope. Compositing of drill-hole samples was completed downhole against any domain flagged in the sample file to belong to the corresponding wireframe for the main K2, K2E and oxides domains. Post estimation, Resource estimations do not have tonnage or grade factors applied. Only gold was estimated and no deleterious elements are noted or estimated.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	The estimated grades were assessed against sample grades and, where applicable, previous estimates.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Block size is 20m (y) x 20m (x) x 25m (z) sub-blocked to 0.5m x 0.5m x 0.5m to suit the narrow north-south orientation of the majority of the domains Average sample spacing is 20m x 20m in the upper zones (oxide/Transitional) and up to 50m x50m in the lower sections. Search ellipsoids are 185m*70m to 370m*140m (Main K2 and K2E structures), 55m*29m to 110m*58m (oxide zones) and 20m*20m to 40m*40m (flat oxide moonbeam zone) and are constrained within mineralised wireframe

Criteria	JORC Code explanation	Commentary
	Any assumptions behind modelling of selective mining units.	No assumptions made.
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill hole logs and grade. Low grades can form part of an ore wireframe. A waste halo is also created around the main ore wireframe and is estimated separately to the main ore.
	Discussion of basis for using or not using grade cutting or capping.	Top-cuts were applied to the composited sample data with the intention of reducing the impact of outlier values on the average grade. Top cuts were selected based on a statistical analysis of the data with a general aim of not impacting the mean by more than 5% and vary by domain.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Validation was conducted using multiple techniques including swath plots, visual, composite vs block grades comparisons.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	For Mineral Resources, the cut-off grade (COG) is generated using an A$1,750 gold price. Costs incorporated in the COG are built from first principals, based either on actual cost history or budgeted estimates. For Resources in active mine areas, a variable COG has been used for the Resource estimate. The Variable costing is defined as all directly incurred costs involved in the development and extraction of the ore panel (e.g., drill & blast, haulage, processing, refining and royalties on sales.). The variable COG does not include capital development or fixed costs (i.e., costs not directly associated with extraction, processing and selling gold) that would be absorbed by the existing Reserve base.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The interpretation of mineralisation is independent of mining considerations. After modelling, the software 'Mineable Shape Optimiser' is used to generate optimal mining shape based on a 2m minimum mining width, and variable costing Cut-off grade at the A$1,750 gold price. Any isolated MSO shapes unlikely to be economic are removed from the estimated Resource. The Resource reported is the Measured, Indicated & Inferred material within the MSO shape generated.
Metallurgical factors or assumptions	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.	Metallurgical test work results show that the mineralisation is amendable to processing through the Kanowna Belle treatment plant. Ore processing throughput and recovery parameters were estimated based on historic performance and potential improvements available using current technologies and practices.
Environmental factors or assumptions	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 green fields 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.	A "License to Operate" is held by the operation which is issued under the requirement of the "Environmental Protection Act 1986", administered by the Department of Environment (DoE). The license stipulates environmental conditions for the control of air quality, solid waste management, water quality, and general conditions for operation. Groundwater licenses are held for water abstraction, including production bore field water use for mineral processing, and mine dewatering, in accordance with the Rights in Water and Irrigation Act 1914. These licenses are also regulated by DoE and are renewable on a regular basis. Kanowna Operations conduct extensive environmental monitoring and management programs to ensure compliance with the requirements of the licenses and lease conditions. An Environmental Management System is in place to ensure that Northern Star employees and contractors exceed environmental compliance requirements. The Kalgoorlie operations (including Kundana) are fully permitted including groundwater extraction and dewatering, removal of vegetation, mineral processing, and open pits.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density is assumed and comparable to neighbouring deposits at Kundana. Bulk densities from neighbouring deposits were determined from surface DD holes with intervals taken from mineralised and non-mineralised zones within the project area. The bulk densities are derived from wet and dry weighting of core no greater than 30cm total length, with core samples selected by changes in lithology/alteration or every 30-40m where no change is evident.

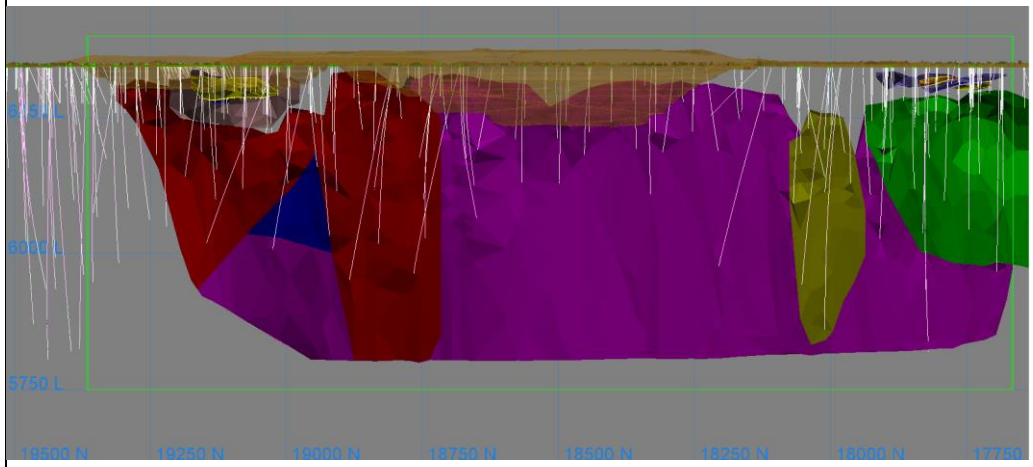
Criteria	JORC Code explanation	Commentary
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities are applied according there their oxidation state.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on a series of factors including: • Geological and grade continuity; • Density of available drilling; • Statistical evaluation of the quality of the kriging estimate.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	All factors considered.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This mineral Resource estimate is considered representative.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Resource has been estimated by a third party external consultant during 2017 (Mining Plus). The reported Northern Star Resource is conservative in comparison to the external results.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This Mineral Resource estimate is considered as robust and representative of the Kundana style of mineralisation. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource.
	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.	This Resource report relates to the entirety of the ore zone and surrounding waste halo. Each of these will show local variability even though the global estimate reflects the total average tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No reconciliation factors are applied to the Resource post-modelling.

MOONBEAM REPRESENTATIVE PLAN & LONG SECTION DIAGRAMS

Plan View of the Moonbeam Deposit



Long Section View of the Moonbeam Deposit



JORC Code, 2012 Edition – Table 1 Report
K2 Pope John Underground - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using a combination of Reverse Circulation (RC) and Diamond Drilling (DD). RC drilling was used to drill pre-collars for many of the holes with diamond tails. Diamond drilling constitutes the rest of the drilling.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Diamond core was transferred to core trays for logging and sampling. Half core samples were nominated by the geologist from both NQ2 and HQ2 diamond core with a minimum sample width of either 20cm (HQ2) or 30cm (NQ2). RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. 4m composite spear samples were collected for each hole with 1m samples submitted for areas of known mineralisation or anomalism.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Samples were taken to Genalysis and MinAnalytical Kalgoorlie for preparation by drying, crushing to <3mm, and pulverising the entire sample to <75µm. 300g Pulps splits were then dispatched to Genalysis and MinAnalytical Perth for 50g fire assay charge and AAS analysis.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Both RC and Diamond Drilling techniques were used at the K2 deposits. DD holes completed pre-2011 were predominantly NQ2 (50.5mm). All Resource definition holes completed post-2011 were drilled using HQ (63.5mm) diameter core. Core was orientated using the Reflex ACT Core orientation system. RC Drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. RC Pre-collar depth was restricted to 180m or less if approaching known mineralisation.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC drilling contractors adjust their drilling approach to specific conditions to maximise sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified during RC drilling. Recovery is often poor at the very beginning of each hole, as is normal for this type of drilling in overburden.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For diamond drilling, the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	Recovery is excellent for diamond core and no relationship between grade and recovery was observed. For RC drilling, pre-collars were ended before known zones of mineralisation and recovery was very good through any anomalous zones.
Logging	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.	All diamond core is logged for regolith, lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	RC chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Resource definition DD drill core is cut and half the core is taken for sampling. The remaining half is stored for later use. Whole core sampling may be used for production and grade control drilling.

Criteria	JORC Code explanation	Commentary
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. These samples were submitted to the lab from any zones approaching known mineralisation and from any areas identified as having anomalous gold. Outside of mineralised zones spear samples were taken over a 4m interval for composite sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sample preparation is considered appropriate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Field duplicates were taken for RC samples at a rate of 1 in 20.
	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.	Exploration sample preparation was conducted at Genalysis Kalgoorlie. Resource Development sample preparation was conducted at Minanalytical Kalgoorlie. Both facilities undertake a similar process commencing with sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Samples are jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverised to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g pulp subsamples are then taken with an aluminium or plastic scoop and stored in labelled pulp packets.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50g fire assay charge is used with a lead flux in the furnace. The prill is totally digested by HCl and HNO_3 acids before Atomic Absorption Spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to test the analysis process. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples. This is random, except where high grade mineralisation is expected. Here, a Blank is inserted after the high grade sample to test for contamination. Failures above 0.2gpt are followed up, and re-assayed. New pulps are prepared if failures remain. Field duplicates are taken for all RC samples (1 in 20 sample). No field duplicates are submitted for diamond core. Regular audits of laboratory facilities are undertaken by Northern Star personnel.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent Person to be signed off.
	The use of twinned holes.	No twinned holes were drilled for this data set
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging is directly entered into an Acquire database. Assay files are received in csv format and loaded directly into the database by the project's responsible geologist with an Acquire importer object. Hardcopy and electronic copies of these are stored
	Discuss any adjustment to assay data.	No adjustments are made to this assay data.
Location of data points	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.	A planned hole is pegged using a Differential GPS by the field assistants. The final collar is picked up after hole completion by Cardno Survey with a Differential GPS in the MGA 94_51 grid. During drilling, single-shot surveys are every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system which measures the gravitational dip and magnetic azimuth results are uploaded directly from the Reflex software export into the Acquire database.
	Specification of the grid system used.	The final collar position for surface holes is measured after hole completion by Differential GPS in the MGA94_51 grid.
	Quality and adequacy of topographic control.	The Differential GPS returns reliable elevation data which has been confirmed against a high resolution Digital Terrain Model survey performed by Arvista in 2015.

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing across the area varies. For the Resource definition drilling, spacing was typically 40m x 40m, to allow the Resource to be upgraded to indicated.
	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.	Resource definition drilling spacing was typically 40m x 40m, to allow the Resource to be upgraded to indicated. Surrounding exploration drilling can be spaced up to 200m apart.
	Whether sample compositing has been applied.	No compositing has been applied to these exploration results, although composite intersections are reported.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of the structures in the Kundana camp dip steeply (80°) to WSW. To target these orientations, the drill hole dips of 60-70° towards ~060° achieve high angle intersections on all structures.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits or reviews have recently been conducted on sampling techniques.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	The Pope John deposit occurs at the junction of 3 tenements, Mining Leases M16/157, M16/97 and M16/87 owned 100% by Northern Star Resources. The Millennium and Centenary deposits are located within Mining Lease M16/87.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	All drilling and exploration of the Barkers Resource was conducted by previous owners of the tenements (including Pancontinental Gold, Aurion Gold, Placer Dome Inc, Barrick Gold) prior to the acquisition by Northern Star Resources.
Geology	Deposit type, geological setting and style of mineralisation.	The Kundana camp is situated within the Norseman-Wiluna Greenstone Belt, in an area dominated by major mineralised shear zones. Barkers-style mineralisation consists of narrow vein deposits (0.20m to 1.0m thick) hosted by shear zones located along steeply-dipping overturned lithological contacts. The footwall stratigraphy of Barkers consists of several different units of the Powder Sill Gabbro, a thick stratigraphy-parallel differentiated mafic intrusive. The volcanoclastic sedimentary rocks of the hanging-wall consist of a sequence of interbedded siltstones, felspathic sandstones, felspathic-lithic wackes and felspathic-lithic rhyolites.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	All holes in the Pope John system are too numerous to list. Face samples used in the estimate are also too numerous to list.

Criteria	JORC Code explanation	Commentary
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No exploration results reported.
	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.	No exploration results reported.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No exploration results reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No exploration results reported.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	No exploration results reported.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	No exploration results reported.
Diagrams	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.	Appropriate plans and section have been included in this report.
Balanced reporting	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced avoiding misleading reporting of Exploration Results.	All valid drill holes within the estimated area have been reported with some holes in the area excluded. Holes were not excluded based on grade or width of the mineralised zone, only on the basis of confidence in the data. Excluded holes consist only of poorly geo-located holes as indicated by discontinuity the position of mineralisation or known geological contacts.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No other material has been collected.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further work will continue in 2017/2018 to extend the Indicated Resource deeper by additional drilling and identify new mineralised shoots on the K2 structure.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	See below.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Sampling and logging data is either recorded on paper and manually entered into a database system, or is captured digitally via a logging laptop and directly loaded into the database system. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly into the database from laboratory and survey data files.
	Data validation procedures used.	Random checks through use of the data and data validation procedure prior to Resource estimation.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The geological interpretations underpinning these Resource models were prepared by geologists who are familiar with the style of mineralisation found at Pope John. The estimation of grades was undertaken by personnel familiar with the particular ore body and the general style of mineralisation encountered.

Criteria	JORC Code explanation	Commentary
	If no site visits have been undertaken indicate why this is the case.	Multiple site visits undertaken by Geologists supervising the drilling programs and preparing the Geological interpretation.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource. The confidence in the geological interpretation is high and is supported with information acquired during multiple drilling campaigns.
	Nature of the data used and of any assumptions made.	The interpretation was based on data obtained from drill hole logging.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed.
	The use of geology in guiding and controlling Mineral Resource estimation.	The interpretation of the main K2 structure is based on the presence of Quartz veining and continuity between sections on the K2 structure. Drill core logging is used to create 3D constraining wireframes.
	The factors affecting continuity both of grade and geology.	Continuity is affected by the orientation of the K2 structure, and several dextral offset fault structures.
Dimensions	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.	The strike length of the Pope John system is approximately 400m. The deepest ore body intersection is approximately 600m below surface. The width of the mineralisation is typically less than one metre.
Estimation and modelling techniques	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.	All grade values were estimated using Kriging, Ordinary Kriging was the preferred method in areas with good sample coverage, Simple Kriging was preferred in areas of poor sample coverage. The K2 structure representing the bulk of the contained metal was estimated using grade accumulation in 2D. The true thickness of each intersection was estimated using the local strike and dip of the interpreted ore body. Values were estimated into model cells for grade accumulation and true thickness. The final grade estimate was calculated by dividing the estimated accumulation value by the estimated thickness value. The alteration and waste domains adjacent to the K2 were estimated using direct grade estimation supported by composited sample data. Composite lengths of 1m were used. The composite files were checked to ensure that no sampling was lost or created during the compositing process. The K2 structure was sub divided into two sub-domains. A high-grade domain was created to encompass the higher grade intersections encountered in the deeper southern quarter of the deposit. Soft boundaries were used when estimating values into each domain. Top cuts were developed for each domain and sub-domain based on a statistical analysis of the data. Note was taken of the number of composites impacted by the application of the top cut as well as the impact the top cut had on the mean and variance of the data set. The top cuts were applied to the data after the sample data had been composited. Variogram models were developed for each domain and sub-domain. Variogram models were developed in 2D or in 3D as appropriate for the estimation protocol adopted for each domain. Search distances used for estimation based on variogram ranges and vary by domain. The Kriging neighbourhood of each domain was refined using statistical measures of Kriging quality. The global mean values used during Simple Kriging were estimated from the declustered mean of the top-cut composited sample data. Drill spacing is generally around 20m x 20m for the indicated Resource and around 40m x 40m for the inferred Resource. The estimated grades were assessed against sample grades and against declustered mean values Extensive use of computer software was made during the estimation process. The principal package used was Datamine Studio RM.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Most deposits in the Kundana area have a history of prior production. The approach used to estimate grades into this system have been used successfully on similar deposits.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.

Criteria	JORC Code explanation	Commentary
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Parent cell sizes of 10m (e/w), 20m (n/s), 20m (elevation) were used in the model. The grade estimation process used 2D panels measuring 20m x 20m (n/s x elevation), the average thickness of the individual domain was used for the thickness of the panels. Search ellipse dimensions were derived from the variogram model ranges and octant declustering was used to ensure that as much as possible the composites selected for use were evenly distributed around the cell to be estimated. A discretisation matrix of 1 x 10 x 10 (X x Y x Z) was used when estimating values into each model cell.
	Any assumptions behind modelling of selective mining units.	Selective mining units were not used during the estimation process. A minimum mining width was used when selecting material for inclusion in Resource tabulations.
	Any assumptions about correlation between variables.	All variables were estimated independently of each other.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralised domains are defined using a pair of wireframe surfaces representing the hanging wall and footwall of the domain. The surfaces are created from drill hole logging with the responsible Geologist selecting the hanging wall and footwall contacts of the K2 structure. The contacts are created as a series of points that can be used to create a surface wireframe. In recognition that the material immediately adjacent to the main ore structures usually has grades elevated above the general background grade separate domains are generated to capture these values. A 1m skin was used to capture values immediately adjacent to the K2. The wireframes to define the dilution skins are created by projecting the vein hanging wall surface to the West and the footwall surface to the east. For mine planning purposes a waste model is created by projecting the hanging wall and footwall surfaces 5m. Sub-domains within the K2 were created using the declustered accumulation values in combination with contour plots developed on the same data. The data sets within the sub-domains were compared to ensure that they different enough to justify their separation.
	Discussion of basis for using or not using grade cutting or capping.	Top-cuts were applied to the composited sample data with the intention of reducing the impact of outlier values on the average grade. Top cuts were selected based on a statistical analysis of the data with a general aim of not impacting the mean by more than 5%. Top-cuts are summarised in the following table:
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Statistical measures of Kriging error, such as Kriging Efficiency and Regression, are used to assess the quality of the estimation for each domain. Swath plots comparing composites to block model grades are prepared and plots are prepared summarising the critical model parameters.

Pope John Project

TOP CUT SUMMARY BY LODE

1.0m composites : Sample Data - 1706.pojo.0.sh.10.ch

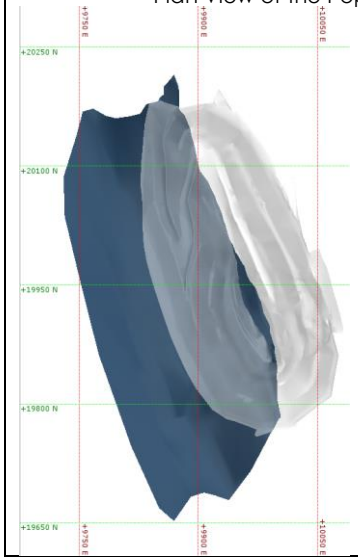
			mean			variance			coefficient of variance			composites		
lode	top cut applied	total no. samples	uncut	cut	cut / uncut	uncut	cut	cut / uncut	uncut	cut	cut / uncut	number comps cut	comps cut (%)	% of metal recovered
au_use comps														
pope john K2	30	134	11.19	9.96	89%	194.6	52.4	27%	1.25	0.73	58%	5	3.7%	90%
pope john high grade	50	66	23.32	20.61	88%	465.7	218.7	47%	0.93	0.72	78%	7	10.6%	89%
footwall f1 domain	5	222	1.02	0.98	96%	1.9	1.5	78%	1.35	1.23	92%	6	2.7%	96%
footwall alteration	2	802	0.22	0.18	84%	0.4	0.1	30%	2.90	1.90	66%	13	1.6%	84%
hanging wall h1 domain	5	222	1.31	1.19	91%	3.6	2.3	63%	1.46	1.27	87%	12	5.4%	92%
hanging wall alteration	5	859	0.53	0.43	82%	2.9	1.0	35%	3.25	2.35	72%	18	2.1%	82%
ttmgAu														
pope john K2	25	118	7.77	7.06	91%	83.5	31.0	37%	1.18	0.79	67%	4	3.4%	91%
pope john high grade	30	51	15.43	13.82	90%	167.3	72.7	43%	0.84	0.62	74%	4	7.8%	90%

Criteria	JORC Code explanation	Commentary
		Visually, block grades are assessed against drill hole data.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	For Mineral Resources, the cut-off grade (COG) is generated using an A$1,750 gold price. Costs incorporated in the COG are built from first principals, based either on actual cost history or budgeted estimates. For Resources in active mine areas, a variable COG has been used for the Resource estimate. The Variable costing is defined as all directly incurred costs involved in the development and extraction of the ore panel (e.g., drill & blast, haulage, processing, refining and royalties on sales.). The variable COG does not include capital development or fixed costs (i.e., costs not directly associated with extraction, processing and selling gold) that would be absorbed by the existing Reserve base.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The interpretation of mineralisation is independent of mining considerations. After modelling, the software 'Mineable Shape Optimiser' is used to generate optimal mining shape based on a 2m minimum mining width, and variable costing Cut-off grade at the A$1,750 gold price. Any isolated MSO shapes unlikely to be economic are removed from the estimated Resource. The Resource reported is the Measured, Indicated & Inferred material within the MSO shape generated.
Metallurgical factors or assumptions	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.	Previous metallurgical test work results and mining activities indicate that the mineralisation is amendable to processing through the Kanowna Belle treatment plant. Ore processing throughput and recovery parameters were estimated based on historic performance and potential improvements available using current technologies and practices.
Environmental factors or assumptions	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 green fields 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.	A "Licence to Operate" is held by the operation which is issued under the requirement of the "Environmental Protection Act 1986", administered by the Department of Environment (DoE). The licence stipulates environmental conditions for the control of air quality, solid waste management, water quality, and general conditions for operation. Groundwater licenses are held for water abstraction, including production bore field water use for mineral processing, and mine dewatering, in accordance with the Rights in Water and Irrigation Act 1914. These licenses are also regulated by DoE and are renewable on a regular basis. Kanowna Operations conduct extensive environmental monitoring and management programs to ensure compliance with the requirements of the licences and lease conditions. An Environmental Management System is in place to ensure that Northern Star employees and contractors exceed environmental compliance requirements. The Kalgoorlie operations are fully permitted including groundwater extraction and dewatering, removal of vegetation, mineral processing, and open pits. Kalgoorlie Operations have been compliant with the International Cyanide Management Code since 2008. Compliance with air quality permits is particularly important at Kanowna because of the roaster operation and because there are three facilities in the Kalgoorlie region emitting SO2 gas. Kanowna has a management program in place to minimize the impact of SO2 on regional air quality, and ensure compliance with regulatory limits.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density was determined from surface diamond drill holes with intervals taken from mineralized and non-mineralised zones within the project area. The bulk densities are derived from wet and dry weighting of core no greater than 30cm total length, with core samples selected by changes in lithology/alteration or every 30-40m where no change is evident.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones and underground environment.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities are applied to domains for the ore zone, footwall and hangingwall as constrained by the lode wireframes.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on a series of factors including: • Geologic grade continuity;

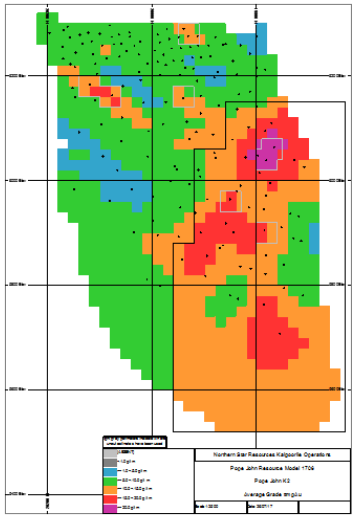
Criteria	JORC Code explanation	Commentary
		• Density of available drilling; • Statistical evaluation of the quality of the kriging estimate.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	All relevant factors have been given due weighting during the classification process.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The Resource model methodology is appropriate and the estimated grades to reflect the Competent Persons view of the deposit.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	All Resource models have been subjected to internal peer reviews.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	These mineral Resource estimates are considered as robust and representative of the Kundana style of mineralisation. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource.
	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.	This Resource report relates to the K2 ore zone and surrounding dilution skins. Each of these will show local variability even though the global estimate reflects the total average tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No reconciliation factors are applied to the Resource post-modelling.

POPE JOHN REPRESENTATIVE PLAN & LONG SECTION DIAGRAMS

Plan View of the Pope John Deposit



Long Section View of the Pope John Deposit Resource Model



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Northern Star Resources Limited June 2017 Mineral Resource.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person has conducted multiple sites visits, and has been involved in the operation from feasibility study to mine development.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	A minimum Pre-Feasibility level study has been completed.
	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.	Upgrade of previous Ore Reserve.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. The assumed AUD gold price is at a conservative assumption of $1,500/oz. Mill recovery factors are based on test work and historical averages from the region. Various cut-off grades are calculated including a fully costed cut-off grade (COG), variable cut-off grade (VCOG) and Mill cut-off grade (MCOG). The VCOG is used as the basis for stope design, though any areas which are marginal or require significant development are assessed by a more detailed financial analysis to confirm their profitability.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Indicated Resources were converted to Probable Ore Reserves subject to mine design physicals and an economic evaluation. Stockpiled material was considered as Proved Reserve.
	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.	Ore is accessed from a decline located in the hangingwall through levels at 20m vertical spacing. A bottom up CRF fill mining method is applied and the levels are broken in to selectively sized stoping blocks to maximise production. The selected mining method was evaluated during the initial Pre-Feasibility study and was deemed the most appropriate. The mining method is similarly used at Northern Star for areas of the nearby Pegasus mine.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	The mine design considers well established geotechnical constraints and is reviewed by geotechnical engineers prior to being finalised. Independent geotechnical reviews were conducted for the Barkers and Strzelecki mines to provide guidance on pillar locations and extraction sequences. Historical geological and geotechnical information is gathered from the nearby operations that operated previously, including Barkers, Strzelecki and Centenary, and still in operation, Raleigh, Rubicon, Hornet and Pegasus, and learnings from this are applied to the geotechnical parameters used. Grade control is carried out through Resource definition drilling and face sampling of all ore drives.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	This Table 1 applies to underground mining only.
	The mining dilution factors used.	5% dilution is applied to CRF filled stopes to account for CRF dilution on the stopes. 10% dilution is applied to unfilled up hole stopes.
	The mining recovery factors used.	95% recovery is applied to CRF filled stopes. A calculated 74% recovery is applied to unfilled up hole stopes to account for pillar requirements.

Criteria	JORC Code explanation	Commentary
	Any minimum mining widths used.	A minimum stope mining width of 2m has been used. This considers a minimum stope width of 2m +0.4m dilution in the Hangingwall and +0.4m dilution in the Footwall.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Designed stopes with greater than 50% inferred blocks are excluded from the reported Ore Reserve. No ounces have been included from Inferred material.
	The infrastructure requirements of the selected mining methods.	Remaining Site surface infrastructure requirements for the mining method include: • CRF Batch Plants for Millennium, Pope John, Barkers, and Strzelecki • Pope John Pit dewatering system All other surface infrastructure was completed in FY16-17. Underground infrastructure requirements include • Ventilation rises for Pope John and Moonbeam, and ventilation extensions on Millennium; • Primary ventilation fans for Pope John and Strzelecki; • Escapeway systems and extensions for Millennium and Pope John; • Power and pumping infrastructure with mine extension; • Historical void dewatering infrastructure; and, • Underground Magazines. All other underground infrastructure was completed in FY16-17.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	All Kundana ore is treated at the Kanowna Belle milling facilities. The plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits. These facilities are designed to handle approximately 1.8 million tonnes of feed per annum. The plant has the capability to treat both refractory and free milling ores, through either using the flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery), or bypassing the flotation circuit and going directly to a CIL circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month.
	Whether the metallurgical process is well-tested technology or novel in nature.	Plus 10 years milling experience with Kundana ores.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Plus 10 years milling experience with Kundana ores.
	Any assumptions or allowances made for deleterious elements.	No assumptions made.
	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.	Plus 10 years milling experience with Kundana ores.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	Millennium, Centenary and Pope John are currently compliant with all legal and regulatory requirements. All government permits and licenses and statutory approvals are either granted or in the process of being granted. Operational expansions to Moonbeam, Barkers, and Strzelecki would be subject to new / amended applications. Based on the locations of these operations and considering historical activities, the Competent Person does not view this as presenting significant risk to the extraction of these ore bodies.
Infrastructure	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.	All current site infrastructure is suitable to the proposed mining plan.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Mine development capital cost based on historical performance on site and life-of-mine forward planning. Plant and equipment capital also based on site experience and the LOM plan.
	The methodology used to estimate operating costs.	All overhead costs and operational costs are projected forward on an AUD $/t based on historical data.

Criteria	JORC Code explanation	Commentary
	Allowances made for the content of deleterious elements.	No allowances made.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of AUD $1,500/oz., 2.5% WA state Government Royalty, as per NSR corporate guidance.
	The source of exchange rates used in the study.	All rates considered in Australian Dollars (AUD) as per NSR corporate guidance.
	Derivation of transportation charges.	Historic performance.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Historic performance.
	The allowances made for royalties payable, both Government and private.	All State Govt. and third party royalties are built into the cost model.
Revenue factors	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.	All revenue based on a gold price of AUD $1,500/oz.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	All product is sold direct at spot market prices.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not relevant for gold.
	Price and volume forecasts and the basis for these forecasts.	Not relevant for gold.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not relevant for gold.
Economic	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.	All costs assumptions are made based on historical performance from the mine and current economic forecast seen as representative of current market conditions.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities assessed at varying gold prices.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	No issues foreseen.
	Any identified material naturally occurring risks.	No issues foreseen.
	The status of material legal agreements and marketing arrangements.	No issues foreseen.
	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.	No issues foreseen.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves include Proved (if any) and Probable classifications. These classifications are based on Mineral Resource classifications as modified by subsequent grade control drilling and face sampling results.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	None.

Criteria	JORC Code explanation	Commentary
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	This ore Reserve has been prepared and peer reviewed internally within Northern Star Resources. There have been no external reviews of this Ore Reserve estimate.
Discussion of relative accuracy/ confidence	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.	Confidence in the model and Ore Reserve is considered high based on nearby Northern Star operated mines along the same ore bearing structures.
	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.	Ore Reserves are best reflected as global estimates.
	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.	Other than dilution and recovery factors described above, no additional modifying factors applied. There is high confidence in these models as the areas is well known and well drilled.
	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.	Reconciliation results from past mining at Centenary, Millennium, Barkers and Strzelecki reflect estimates in the Ore Reserve estimates. Production data for Pope John is not yet available as of 30 June 2017.

JORC Code, 2012 Edition – Table 1 Report
Strzelecki Underground - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	A combination of sample types was used to collect material for analysis including both surface and underground diamond drilling (DD), reverse circulation (RC) surface drilling and face channel (FC) sampling.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	DD drilling is sampled within geological boundaries with a minimum sample length. Face channel sampling is constrained within geological and mineralised boundaries. RC drilling is primarily sampled on 1m intervals, 4m composite spear samples may be collected in areas where mineralisation is not expected.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	RC sampling was split using a rig mounted cone splitter to deliver a sample of approximately 3Kg. Historic underground DD drill core was cut in half using an automated core saw the mass of material collected will depend on the hole size and sampling interval. NSR surface DD core was whole core sampled due to the high nugget nature of mineralisation. Approximately 3Kg of material was collected for each face sample interval. All samples were delivered to a commercial laboratory where they were dried, crushed to 95% passing 3mm if required, at this point large samples may be split using a rotary splitter, pulverisation to 95% passing 75µm, a 30g charge was selected for fire assay. NSR samples were routinely screen fire assayed using a 75iu mesh.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Both RC and Diamond Drilling techniques were used at the Strzelecki line deposits. Diamond drill holes completed pre-2011 were predominantly NQ2 (50.5mm). All Resource definition holes completed post 2011 were drilled using HQ (63.5mm) diameter core. Daughter holes were NQ. Core was orientated using the Reflex ACT Core orientation system. RC Drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. In many cases RC pre-collars were drilled followed by diamond tails. Pre-collar depth was to 180m or less if approaching known mineralization
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC drilling contractors adjust their drilling approach to specific conditions to maximize sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified during RC drilling programs. Recovery was poor at the very beginning of each hole, as is normal for this type of drilling in overburden.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For diamond drilling the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	Recovery was excellent for diamond core and no relationship between grade and recovery was observed. For RC drilling, pre-collars were ended before known zones of mineralization and recovery was very good through any anomalous zones, no issues were noted.
Logging	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.	All diamond core is logged for regolith, lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	RC sample chips are logged in 1m intervals. For the entire length of each hole. Regolith, Lithology, alteration, veining and mineralisation are all recorded.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Diamond core is cut using an automated core saw. In most cases, half the core is taken for sampling with the remaining half being stored for later reference. Whole core was also submitted throughout this process.

Criteria	JORC Code explanation	Commentary
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a sample 3-4kg in size from each 1m interval. These samples were utilised for any zones approaching known mineralization and from any areas identified as having anomalous gold. Outside known mineralized zones spear samples were taken over a 4m interval for composite sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sampling types used are considered appropriate for the deposits.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Procedures are available to guide the selection of sample material in the field. Standard procedures are used for all process within the laboratory.
	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.	Field duplicates were taken for RC samples at a rate of 1 in 20.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Umpire sampling programs are carried out on an ad-hoc basis.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 30g or 50g Fire assay charge is used with a lead flux, dissolved in the furnace. The prill is totally digested by HCl and HNO_3 acids before Atomic absorption spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified Reference Materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations are re-assayed with a new CRM.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent person to be signed off.
	The use of twinned holes.	No Twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging was captured using excel templates. Both a hardcopy and electronic copy of these are stored, as well as being loaded in to the database using automatic acquire loaders. Assay files are received in csv format and loaded directly into the database by Northern Star Geologists. A geologist then checks that the results have inserted correctly. Hardcopy and electronic copies of these are stored.
	Discuss any adjustment to assay data.	No adjustments are made to this assay data.
Location of data points	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.	Planned surface hole positions are located using a Differential GPS by Northern Star staff or a 3rd party contractor. Underground diamond hole positions are marked before drilling by mine survey staff and the actual hole collar position located by mine survey staff once drilling is completed. Surface holes are designed in MGA94_51 grid. During surface drilling, single-shot surveys are every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system. Upon hole completion, a Gyroscopic survey is conducted by a third-party contractor, taking readings every 5m for improved accuracy. Direction measurements are collected relative to true north. For UG holes multi-shot surveys are taken every 9m when retreating out of the hole.
	Specification of the grid system used.	Data is collected using both local mine grid and MGA 94_51 as appropriate.
	Quality and adequacy of topographic control.	Quality topographic control has been achieved through Lidar data and survey pickups of holes over the last 15 years.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Face sampling data is generally 3.5 metres, which equals a development advance cut. Drill hole spacing across the area varies. For underground ranging from 20m x 20m to 40m x 40m to allow the Resource to be upgraded to indicated. For recent NSR surface drilling, spacing is generally wider 120m to 60m, with some infill holes closing to 40m-50m. The majority of these areas are inferred, with areas greater than 100m unclassified.

Criteria	JORC Code explanation	Commentary
	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.	The data spacing and distribution is considered sufficient to support the Resource and Reserve estimates where spacing is 100m or less.
	Whether sample compositing has been applied.	Sample data is composited before grade estimation is undertaken.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of the structures in the Kundana camp dip steeply (80°) to WSW. To target these orientations the drill hole dips of 60-70° towards ~060° achieve high angle intersections on all structures.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits or reviews have recently been conducted on sampling techniques.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	The Strzelecki Mine is situated on the tenements M16/97 and M16/157, wholly owned by Northern Star Resources. There are no private royalty agreements applicable to this tenement.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The first reference to the mineralization style encountered at the Kundana project was the mines department report on the area produced by Dr. I. Martin (1987). He reviewed work completed in 1983 – 1984 by a company called Southern Resources, who identified two geochemical anomalies, creatively named Kundana #1 and Kundana #2. The Kundana #2 prospect was subdivided into a further two prospects, dubbed K2 and K2A. Kundana Gold Pty owned and operated the Kundana Gold Mine and treatment plant, focussing on the Centenary, North and Strzelecki pits, which were completed by June 1993. Underground mining soon commenced from extensions to the Strzelecki and South Pits.
Geology	Deposit type, geological setting and style of mineralisation.	The Kundana camp is situated within the Norseman-Wiluna Greenstone Belt, in an area dominated by the Zuleika shear zone, which separates the Coolgardie domain from the Ora Banda domain. Strzelecki deposit is located on the Strzelecki shear zone which also hosts the Raleigh Deposit. The Strzelecki deposit is comprised of 2 laminated gold bearing veins, the "main vein" and the "footwall vein". The main vein, which dips between 55-70° to the west, has an average width of 0.5-0.7m and length of 500m, it is responsible for the bulk of the ounces extracted from the Strzelecki Mine. The vein typically grades between 60-90 gpt. The Strzelecki deposit is bound to the north by the Pope John Fault and to the south by the Lucifer Fault. The Lucifer Fault offsets the Raleigh deposit south from the Christmas deposit. The rock units consist of Powder Sill Gabbro on the hanging wall, generally a thin sliver of silicified Felsic volcanics immediately adjacent to the Strzelecki Vein and Felsic-intermediate volcanics in the footwall. The Strzelecki structure consists of a laminated vein with associated shearing. Intermediate andesitic tuff is located on the FW side of the structure. Strzelecki resides uncomfortably north along strike of the K2 hosted Moonbeam deposit (Figure 3). Gold grade is higher towards the south.

Criteria	JORC Code explanation	Commentary
		 **Mineralised laminated vein 1 from CHCD16004 (630.23-630.54m).**
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically list the complete dataset, the long section and plan reflect the hole positions used for previous estimation stated.
	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.	
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No exploration results are reported in this release.
	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.	No exploration results are reported in this release.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No exploration results are reported in this release.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No exploration results are reported in this release.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	No exploration results are reported in this release.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	
Diagrams	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.	Appropriate plans and section have been included in the body of this report.

Criteria	JORC Code explanation	Commentary
Balanced reporting	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.	Both high and low grades have been reported accurately, clearly identified with the drill hole attributes and 'From' and 'To' depths.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Substantial historical metallurgical data exists from previous mining operations. In addition, the deposit closely resembles Raleigh Mine which is still actively mined.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Resource definition and extension drilling program is planned once underground drilling platforms are established from neighboring mines (Moonbeam, Pope John or Strzelecki).
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Northern Star personnel have validated the database during the interpretation of the mineralisation, with any holes containing dubious data excluded from the MRE. Northern Star provided a list of holes to be excluded from the MRE and the reasons behind those exclusions.
	Data validation procedures used.	Data validation processes are in place and run upon import into the database to be used for the MRE in Vulcan V10.0.4 by Mining Plus.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	MP have not undertaken a site visit, although the Northern Star personnel liaised with during the MRE process and responsible for the mineralisation interpretation and input data have been to site and reviewed the core for this deposit.
	If no site visits have been undertaken indicate why this is the case.	Not applicable.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The geological interpretation is considered robust due to the nature of the mineralisation and that portions of the deposit have been developed along and mined. The level plans and other maps have been used to guide the sub-domaining process.
	Nature of the data used and of any assumptions made.	Underground development mapping and sampling along with diamond drill core lithology, structure, alteration and mineralisation logs have been used to generate the mineralisation model. The primary assumption is that the mineralisation is hosted within structurally controlled quartz veins, which is considered robust.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	Due to the close spaced nature of the data from the historic mining and the consistency of the structure conveyed by this dataset, no alternative interpretations have been considered.
	The use of geology in guiding and controlling Mineral Resource estimation.	The mineralisation interpretation is based on a combination of logged quartz percentage or structure and assays.
	The factors affecting continuity both of grade and geology.	The structure is considered to be continuous over the length of the deposit with either quartz or the controlling structure used to guide this interpretation. The grade continuity is not as consistent and as such, the mineralisation has been sub-domained based on consistent grade zones, with these sub-domains used as hard boundaries during the estimation.
Dimensions	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.	The Strzelecki deposit is hosted within the one structure which strikes approximately N-S over a length of 1.3 km and dips steeply to the W with the down-dip extents in excess of 1,200 m. Although hosted along what is interpreted to be the one structure, the boundary between the Strzelecki and Strzelecki South deposits has been defined by a change in strike from 340° to 005° respectively. The Strzelecki deposit has a strike length of 500 – 600 m with a down-dip extent of 1,200 m. The Strzelecki South deposit extends over 800 m of strike at the top of the deposit (near surface) with a dip extent of 1,200 m.

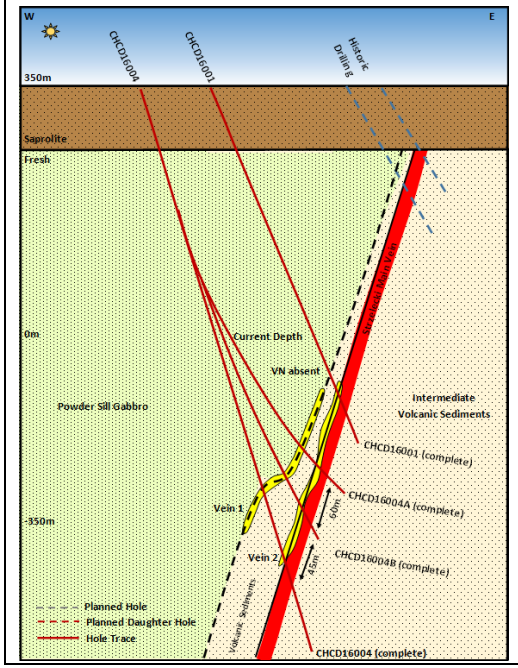
Criteria	JORC Code explanation	Commentary
Estimation and modelling techniques	The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.	Grade estimation of gold has been completed using Ordinary Kriging (OK) for the Strzelecki deposit into 5 gold domains using Maptek Vulcan V10.0.4 software. Two domains defined by a small number of drill hole intercepts have been estimated using an Inverse distance squared interpolation technique. Variography has been undertaken on grouped domains for gold. Variogram orientations are largely controlled by the strike and dip of the mineralisation, with the plunge of the higher grade mineralisation evident in long section being effectively replicated during the continuity analysis.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	MP completed the previous MRE update in December 2016 for the Strzelecki-Strzelecki South mineralisation for comparison purposes.
	The assumptions made regarding recovery of by-products.	The Mineral Resource Estimate has been validated using visual validation tools combined with volume comparisons with the input wireframes, mean grade comparisons between the block model and de-clustered composite grade means and swath plots comparing the de-clustered composite grades and block model grades by Northing, Easting and RL.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No assumptions have been made regarding recovery of any by-products.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The data spacing varies considerably within the deposit ranging from underground development samples taken approximately every 3 m along strike and at 25 m vertically spaced intervals to drill hole intercepts which varied from close spaced 20 m (along strike) to 25 m (down dip) spacings through to 75 m (along strike) to 100 m (down dip) spacings. Due to this disparity in data spacing, variable block sizes have been used during the estimation, with 5 m (X) by 5 m (Y) by 12.5 m (Z) used for the area covered by the underground development and a larger parent block size of 10 m (X) by 10 m (Y) by 25 m (Z) used for the areas defined by drill-hole intercepts. A sub-block size of 0.5 m (X) by 0.5 m (Y) by 0.5 m (Z) has been used to define the mineralisation, with the gold estimated at the parent block scale. Pass 1 estimations have been undertaken using a minimum of 6 and a maximum of 20 samples into a search ellipse set at between a half and a quarter of the variogram range for all domains, with a maximum of two samples from each drill hole allowed. Pass 2 estimations have been undertaken using a minimum of 4 and a maximum of 20 samples into a search ellipse set generally set at the variogram range for all domains with a maximum of two samples from each drill hole allowed. Pass 3 estimations have been undertaken using a minimum of 2 and a maximum of 20 samples into a search ellipse set at the variogram range. Two domains with widely spaced data points at depth and along strike have been estimated using a fourth interpolation pass, with this pass using a minimum of 1 and a maximum of 20 samples into a search ellipse one and a half to twice the size of the variogram range. The search ellipses and variography rotation applied during the estimation of each block has been determined by the orientation of the hangingwall and footwall contacts through the use of the dynamic anisotropy function in Maptek Vulcan V10.0.4.
	Any assumptions behind modelling of selective mining units.	No selective mining units are assumed in this estimate.
	Any assumptions about correlation between variables.	No other elements other than gold have been estimated.
	Description of how the geological interpretation was used to control the Resource estimates.	The mineralisation wireframes supplied by Northern Star have been sub-domained in consultation with Northern Star based on orientation and grade, with these sub-domains used to flag the drill hole intercepts in the database. These flagged intercepts have then been used to create composites in Maptek Vulcan V10.0.4 using a residual of 0.1 m. The composite length created varied from 0.5 m for both drill hole and face sample intercepts in the area covered by the underground development to 1.0 m lengths for the drilling defined areas. The composites have been length weighted during the estimation to account for the different composite lengths used.
	Discussion of basis for using or not using grade cutting or capping.	The influence of extreme sample distribution outliers has been reduced by top-cutting where required. The top-cut levels have been determined using a combination of histograms, log probability and mean variance plots. Top-cuts have been reviewed and applied on a domain by domain basis. For several the domains, the inclusion of a significant amount of sub-grade material (at detection limit) has skewed the coefficient of variation resulting in a more conservative top-cut grade being used causing a significant decrease in the mean grade of the cut data set –

Criteria	JORC Code explanation	Commentary
		this represents a de-risked estimate of the grade. Ideally, the removal of these sub-grade zones should be investigated to better represent the grade distribution within these domains.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Model validation has been carried out, including visual comparison between de-clustered composites and estimated blocks; check for negative or absent grades; statistical comparison against the input drill hole data and graphical plots.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	The tonnes have been estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	For Mineral Resources, the cut-off grade (COG) is generated using an A$1,750 gold price. Costs incorporated in the COG are built from first principals, based either on actual cost history or budgeted estimates. For Resources in active mine areas, a variable COG has been used for the Resource estimate. The Variable costing is defined as all directly incurred costs involved in the development and extraction of the ore panel (e.g., drill & blast, haulage, processing, refining and royalties on sales.). The variable COG does not include capital development or fixed costs (i.e., costs not directly associated with extraction, processing and selling gold) that would be absorbed by the existing Reserve base.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The interpretation of mineralisation is independent of mining considerations. After modelling, the software 'Mineable Shape Optimiser' is used to generate optimal mining shape based on a 2m minimum mining width, and variable costing Cut-off grade at the A$1,750 gold price. Any isolated MSO shapes unlikely to be economic are removed from the estimated Resource. The Resource reported is the Measured, Indicated & Inferred material within the MSO shape generated.
Metallurgical factors or assumptions	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.	No metallurgical or recovery assumptions have been made during the MRE.
Environmental factors or assumptions	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 green fields 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.	No environmental assumptions have been made during the MRE.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density values have been applied based on the degree of weathering which has been coded into the model. The values used have been obtained from a previous MRE for the Barkers Deposit which is along strike from Strzelecki. No information has been provided on the number of measurements or method used to obtain these values.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No information has been provided on the number of measurements or method used to obtain these values.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	The Resource classification has been applied to the MR estimate based on the drilling data spacing, grade and geological continuity, and data integrity.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	The classification takes into account the relative contributions of geological and data quality and confidence, as well as grade confidence and continuity.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The classification reflects the view of the Competent Person.

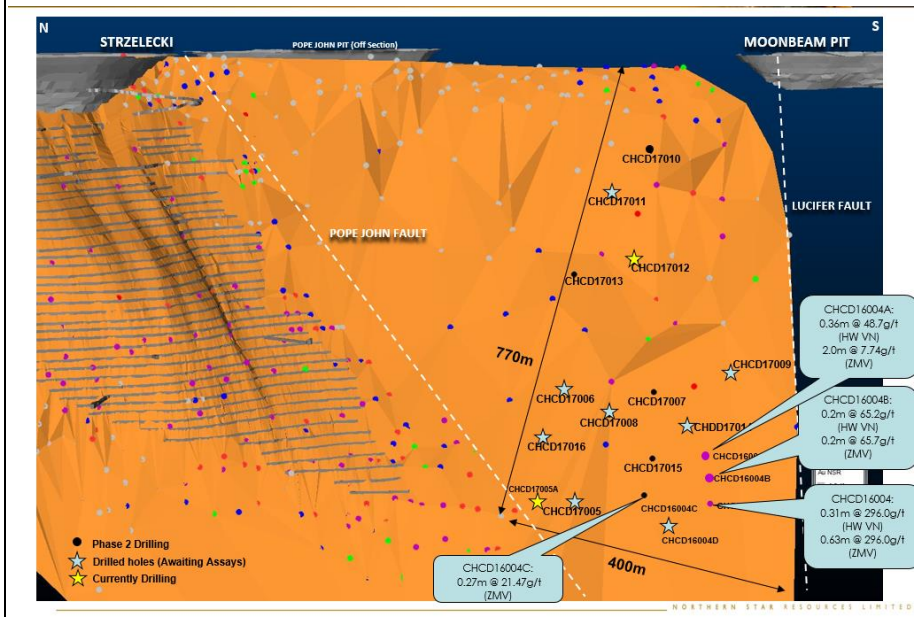
Criteria	JORC Code explanation	Commentary
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Mineral Resource estimate for Strzelecki deposit has not been audited by an external party.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC Code.
	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.	
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	The statement relates to global estimates of tonnes and grade.

STRZELECKI - REPRESENTATIVE LONG PROJECTION AND CROSS SECTION DIAGRAMS

Cross Section: Strzelecki Deposit



Long Projection: Strzelecki Deposit



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Northern Star Resources Limited June 2017 Mineral Resource.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person has conducted multiple sites visits, and has been involved in the operation from feasibility study to mine development.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	A minimum Pre-Feasibility level study has been completed.
	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.	Upgrade of previous Ore Reserve.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Forward looking forecast costs and physicals form the basis of the cut-off grade calculations. The assumed AUD gold price is at a conservative assumption of $1,500/oz.; Mill recovery factors are based on test work and historical averages from the region. Various cut-off grades are calculated including a fully costed cut-off grade (COG), variable cut-off grade (VCOG) and mill cut-off grade (MCOG). The VCOG is used as the basis for stope design, though any areas which are marginal or require significant development are assessed by a more detailed financial analysis to confirm their profitability.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Indicated Resources were converted to Probable Ore Reserves subject to mine design physicals and an economic evaluation. Stockpiled material was considered as Proved Reserve.
	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.	Ore is accessed from a decline located in the hangingwall through levels at 20m vertical spacing. A bottom up CRF fill mining method is applied and the levels are broken in to selectively sized stoping blocks to maximise production. The selected mining method was evaluated during the initial Pre-Feasibility study and was deemed the most appropriate. The mining method is similarly used at Northern Star for areas of the nearby Pegasus mine.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	The mine design considers well established geotechnical constraints and is reviewed by geotechnical engineers prior to being finalised. Independent geotechnical reviews were conducted for the Barkers and Strzelecki mines to provide guidance on pillar locations and extraction sequences. Historical geological and geotechnical information is gathered from the nearby operations that operated previously, including Barkers, Strzelecki and Centenary, and still in operation, Raleigh, Rubicon, Hornet and Pegasus, and learnings from this are applied to the geotechnical parameters used. Grade control is carried out through Resource definition drilling and face sampling of all ore drives.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	This Table 1 applies to underground mining only.
	The mining dilution factors used.	5% dilution is applied to CRF filled stopes to account for CRF dilution on the stopes. 10% dilution is applied to unfilled up hole stopes.
	The mining recovery factors used.	95% recovery is applied to CRF filled stopes. A calculated 74% recovery is applied to unfilled up hole stopes to account for pillar requirements.
	Any minimum mining widths used.	A minimum stope mining width of 2m has been used. This considers a minimum stope width of 2m +0.4m dilution in the Hangingwall and +0.4m dilution in the Footwall.

Criteria	JORC Code explanation	Commentary
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Designed stopes with greater than 50% inferred blocks are excluded from the reported Ore Reserve. No ounces have been included from Inferred material.
	The infrastructure requirements of the selected mining methods.	Remaining Site surface infrastructure requirements for the mining method include: • CRF Batch Plants for Millennium, Pope John, Barkers, and Strzelecki; • Pope John Pit dewatering system; • Moonbeam power infrastructure; • Moonbeam pit portal access; All other surface infrastructure was completed in FY16-17. Underground infrastructure requirements include: • Ventilation rises for Pope John and Moonbeam, and ventilation extensions on Millennium; • Primary ventilation fans for Pope John and Strzelecki; • Escape way systems and extensions for Millennium and Pope John; • Power and pumping infrastructure with mine extension; • Historical void dewatering infrastructure; and, • Underground Magazines. All other underground infrastructure was completed in FY16-17.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	All Kundana ore is treated at the Kanowna Belle milling facilities. The plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits. These facilities are designed to handle approximately 1.8 million tonnes of feed per annum. The plant has the capability to treat both refractory and free milling ores, through either using the flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery), or bypassing the flotation circuit and going directly to a CIL circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month.
	Whether the metallurgical process is well-tested technology or novel in nature.	Plus 10 years milling experience with Kundana ores.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Plus 10 years milling experience with Kundana ores.
	Any assumptions or allowances made for deleterious elements.	No assumptions made.
	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.	Plus 10 years milling experience with Kundana ores.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	Millennium, Centenary and Pope John are currently compliant with all legal and regulatory requirements. All government permits and licenses and statutory approvals are either granted or in the process of being granted. Operational expansions to Moonbeam, Barkers, and Strzelecki would be subject to new / amended applications. Based on the locations of these operations and considering historical activities, the Competent Person does not view this as presenting significant risk to the extraction of these ore bodies.
Infrastructure	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.	All current site infrastructure is suitable to the proposed mining plan.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Mine development capital cost based on historical performance on site and life-of-mine forward planning. Plant and equipment capital also based on site experience and the LOM plan.
	The methodology used to estimate operating costs.	All overhead costs and operational costs are projected forward on an AUD $/t based on historical data.

Criteria	JORC Code explanation	Commentary
	Allowances made for the content of deleterious elements.	No allowances made.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of AUD $1,500/oz., 2.5% WA state Government Royalty, as per NSR corporate guidance.
	The source of exchange rates used in the study.	All rates considered in Australian Dollars (AUD) as per NSR corporate guidance.
	Derivation of transportation charges.	Historic performance.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Historic performance.
	The allowances made for royalties payable, both Government and private.	All State Govt. and third party royalties are built into the cost model.
Revenue factors	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.	All revenue based on a gold price of AUD $1,500/oz.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	All product is sold direct at spot market prices.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not relevant for gold.
	Price and volume forecasts and the basis for these forecasts.	Not relevant for gold.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not relevant for gold.
Economic	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.	All costs assumptions are made based on historical performance from the mine and current economic forecast seen as representative of current market conditions.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities assessed at varying gold prices.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	No issues foreseen.
	Any identified material naturally occurring risks.	No issues foreseen.
	The status of material legal agreements and marketing arrangements.	No issues foreseen.
	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.	No issues foreseen.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves include Proved (if any) and Probable classifications. These classifications are based on Mineral Resource classifications as modified by subsequent grade control drilling and face sampling results.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	None.

Criteria	JORC Code explanation	Commentary
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	This ore Reserve has been prepared and peer reviewed internally within Northern Star Resources. There have been no external reviews of this Ore Reserve estimate.
Discussion of relative accuracy/ confidence	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.	Confidence in the model and Ore Reserve is considered high based on nearby Northern Star operated mines along the same ore bearing structures.
	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.	Ore Reserves are best reflected as global estimates.
	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.	Other than dilution and recovery factors described above, no additional modifying factors applied. There is high confidence in these models as the areas is well known and well drilled.
	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.	Reconciliation results from past mining at Centenary, Millennium, Barkers and Strzelecki reflect estimates in the Ore Reserve estimates. Production data for Pope John is not yet available as of 30th June 2017.

JORC Code, 2012 Edition – Table 1 Report
Carbine Open Pit - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using a combination of Reverse Circulation (RC), Rotary Air Blast (RAB) and Diamond (DD) drilling. RAB drilling was used in areas with no other drilling, where mineralisation is consistent. No areas using RAB drilling was categorised above Inferred status.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. Diamond core was placed in core trays for logging and sampling. Half core samples were nominated by the geologist from diamond core with a minimum sample width of either 20cm (HQ) or 30cm (NQ2).
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Samples were taken to Genalysis Kalgoorlie for preparation by drying, crushing to <3mm, and pulverising the entire sample to <75µm. 300g Pulps splits were then dispatched to Genalysis Perth for fire assay using a 50gmcharge and AAS analysis.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	The Resource calculation was based on both historic validated drill data and recent drilling. Recent RC drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Moisture content and sample recovery is recorded for each RC sample.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	RC drilling contractors adjust their drilling approach to specific conditions to maximise sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified during 2014 RC drilling. Recovery was poor at the very beginning of each hole, as is normal for this type of drilling in overburden.
	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.	No relationship or bias has identified between grade and sample recovery.
Logging	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.	RC sample chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every chip tray.
	The total length and percentage of the relevant intersections logged.	In all instances, the entire drill hole is logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	There has been no recent Carbine core drilling
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. All samples were intended and assumed to be dry, moisture content was recorded for every sample.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Sample preparation was conducted at Genalysis Kalgoorlie, commencing with sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Samples are jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverised to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g Pulp subsamples are then taken with an aluminium scoop and stored in labelled pulp packets.

Criteria	JORC Code explanation	Commentary
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size.
	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.	Field duplicates were taken for RC samples at a rate of 1 in 50.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50gm FIRE assay charge is used with a lead flux in the furnace. The prill is totally digested by HCl and HNO_3 acids before Atomic Absorption Spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted randomly into the sample sequence at a rate of 1 per 20 samples, except where high grade mineralisation is expected. Here, a blank is inserted after the high grade sample to test for contamination. Failures above 0.2gpt are followed up, and re-assayed. New pulps are prepared if failures remain. Field duplicates are taken for all RC samples (1 in 50 samples). No field duplicates are submitted for diamond core.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent Person to be signed off.
	The use of twinned holes.	No twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging is directly entered into an Acquire database. Assay files are received in csv format and loaded directly into the database by the project's responsible geologist with an Acquire importer object. Hardcopy and electronic copies of these are stored.
	Discuss any adjustment to assay data.	No adjustments are made to this assay data.
Location of data points	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.	A planned hole is pegged using a Differential GPS by the field assistants. The final collar is picked up after hole completion by Differential GPS in the MGA 94_51 grid. During drilling, single-shot surveys are every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system which measures the gravitational dip and magnetic azimuth results are uploaded directly from the Reflex software export into the Acquire database.
	Specification of the grid system used.	Collar coordinates are recorded in MGA94 Zone 51.
	Quality and adequacy of topographic control.	The Differential GPS returns reliable elevation data which has been confirmed against older (early 2000's) topographic surveys.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing across the area varies.
	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.	The data spacing is considered sufficient for an Inferred Resource.
	Whether sample compositing has been applied.	No compositing has been applied.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The orientation of the target is fairly well known. Knowledge of previous orebodies in the area suggests drilling direction is perpendicular to the orientation of mineralisation.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.

Criteria	JORC Code explanation	Commentary
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits have been undertaken for the drill holes at this stage.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All drilling in this report are located within Mining Lease M16/239 which is owned by Kundana Gold Pty Ltd, a wholly owned subsidiary of Northern Star Resources. There are no private royalty agreements applicable to this tenement.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The Carbine area has been explored since the late 1800's. Numerous companies, including BHP, Newcrest, Centaur Mining, Goldfields, Placer Dome and Barrick have been active in the area.
Geology	Deposit type, geological setting and style of mineralisation.	The Carbine area is northern extension of the regionally significant Zuleika Shear Zone. The tenements are in the Norseman-Wiluna Archaean greenstone belt in the Eastern Goldfields province of the Yilgarn Craton, Western Australia. Gold mineralisation in the Zuleika Shear Zone and adjacent greenstone sequences occurs in all rock types, although historical and recent production is dominated by two predominant styles: Brittle D2 faults with laminated (multiple crack-seal) quartz veining containing gold and trace base metal sulphides (galena, sphalerite, chalcopyrite, scheelite), Brittle quartz vein stock works developed within granophyric gabbro within the Powder Sill At the Carbine main deposit, gold is hosted in veins and disseminated sulphides associated with structural disruption caused by a series of thrust faults, where the lower mafic/ultramafic sequence has been thrust over younger sediments.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too numerous to present here. The Carbine Resource is based predominantly on historic validated drilling with the addition of recent drilling to validate and extend.
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No Exploration results being released.
	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.	No Exploration results being released.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No Exploration results being released.

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No Exploration results being released.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	There is enough historic exploration and production data at Carbine to infer geological continuity in mineralisation.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	No Exploration results being released.
Diagrams	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.	Appropriate plans and section have been included in this release.
Balanced reporting	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.	Both high and low grades have been reported accurately, clearly identified with the drill hole attributes and 'From' and 'To' depths. All target zone intercepts for all eight holes have been reported for this drill program regardless of grade.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No other material exploration data has been collected for this area.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further drilling is planned to target extensions.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Appropriate diagrams accompany this release.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

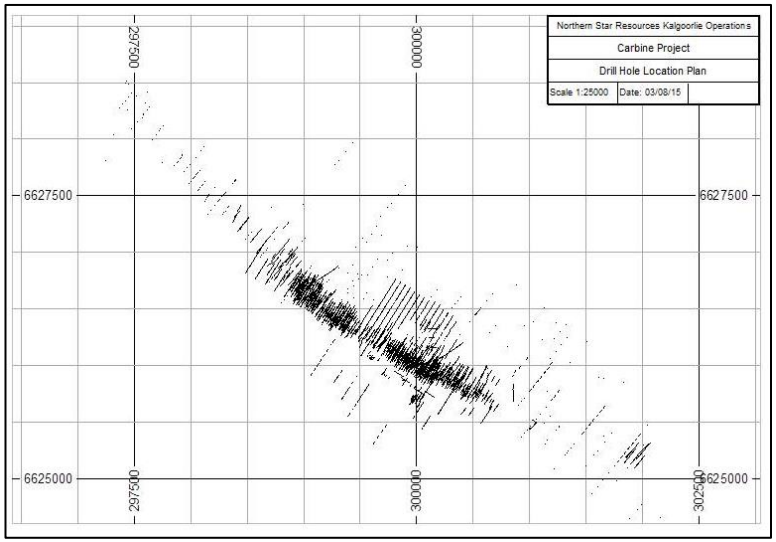
Criteria	JORC Code explanation	Commentary
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	All data is stored in a digital database with logging of changes and management of data integrity. Validation is enforced when the data is captured. Data is exported to ASCII files before importation into Resource modelling software, no manual editing is undertaken on any data during the export/import process The data extracted from the database was accepted as valid.
	Data validation procedures used.	
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Multiple site visits undertaken by geologists supervising the drilling programs and preparing the geological interpretation.
	If no site visits have been undertaken indicate why this is the case.	Site visits were undertaken.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The geological logging data supporting the interpretation was collected over a significant time frame utilizing legends designed by different companies. Some inconsistencies have been noted between the different generations of logging. However, the available data is sufficiently detailed to establish the geological controls on the mineralisation. In addition to the geological logging from drill data, geological mapping from the existing open pit is available and supports the interpretation. The interpretation is consistent with similar known ore bodies in the immediate area There are several known structural offsets in the ore body, however, detailed information on the localised impact of the structural controls is not currently available.
	Nature of the data used and of any assumptions made.	
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	
	The use of geology in guiding and controlling Mineral Resource estimation.	
	The factors affecting continuity both of grade and geology.	

Criteria	JORC Code explanation	Commentary
Dimensions	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.	Mineralisation has been identified over a strike length over 2,000m and over a depth of approximately 550m. Mineralisation is between 1m and 20m thick
Estimation and modelling techniques	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.	Drill holes were composited into 2m intervals down hole within each interpreted domain. The composite lengths were allowed to vary between 1.5m and 2.5m to ensure that no sampling was lost during the compositing process. The average grade and total length of the composite data was compared against the average grade and total length of the un-composited data to check the compositing process. The distribution of composite lengths was checked to ensure that the majority of the composites were close to the targeted length. Ordinary Kriging was used in areas with good drill coverage, Simple Kriging was used to estimate areas with poor drill coverage. The local mean value used for Simple Kriging was calculated from the declustered mean of the top-cut composited sample data. Search distances used for estimation based on variogram ranges and vary by domain. Drill spacing is generally around 20m x 20m. Top-cuts were applied to the sample data based on a statistical analysis of the data and vary by domain. The Kriging neighbourhood was refined using statistical measures of Kriging quality. The estimated grades were assessed against sample grades and against declustered mean values.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	
	The assumptions made regarding recovery of by-products.	
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	
	Any assumptions behind modelling of selective mining units.	
	Any assumptions about correlation between variables.	
	Description of how the geological interpretation was used to control the Resource estimates.	
	Discussion of basis for using or not using grade cutting or capping.	
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnes were assumed to be dry.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Cut-off grades for reporting the Resource were developed using a gold price of A$1,700 per ounce and budgeted mining costs for 2016/17.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	An open pit optimization study was conducted to determine the portion of the more to report as the Resource with the potential pit shell evaluated using a gold price of $A1,700/oz. Mining costs typical of those currently available for an operation of the anticipated size were assumed. The optimization study allowed for mining dilution of 10% and 98% ore recovery. Metallurgical recovery was assumed to be 93% based on past production records.
Metallurgical factors or assumptions	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.	Metallurgical recovery factors have been developed based on extensive experience processing similar material from the Kanowna area and based on past production records.
Environmental factors or assumptions	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 green fields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported.	The utilisation of existing Kundana/Kanowna infrastructure will minimise the impact of development of the project. Existing waste rock and tailings storage facilities have adequate available capacity to accommodate the project.

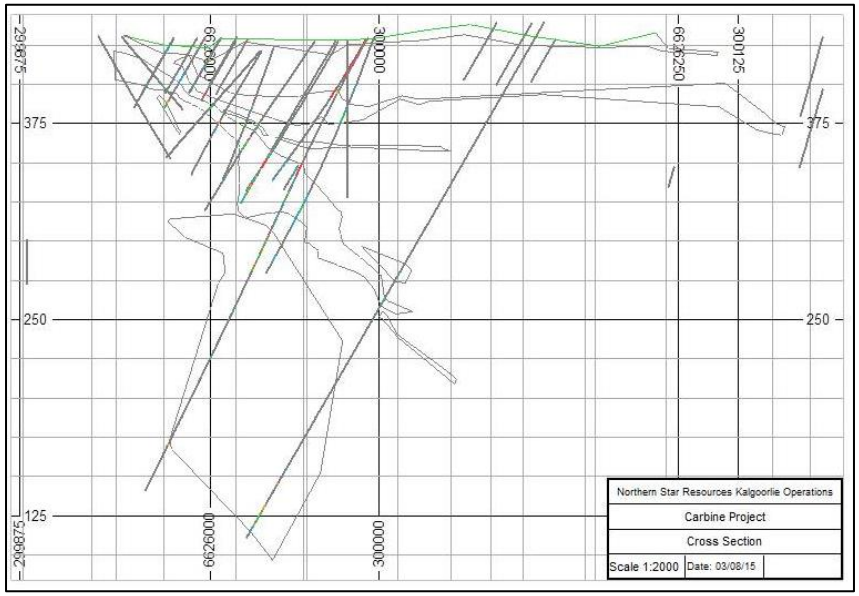
Criteria	JORC Code explanation	Commentary
	Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density measurements from project drilling and from past production within the area were used to assign values within interpreted weathering horizons.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	The classification of the Resource was based on a series of factors including: Geological and grade continuity; Density of available drilling; Statistical evaluation of the quality of the kriging estimate.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	
	Whether the result appropriately reflects the Competent Person's view of the deposit.	
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The Resource model has been reviewed internally by Northern Star staff.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This Mineral Resource estimate is considered as robust and representative of the Carbine style of mineralisation. The estimate is considered to be robustly estimated on a global scale for material classified as Inferred.
	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.	
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	

CARBINE - REPRESENTATIVE PLAN AND CROSS SECTION

Plan view: Carbine Resource drill collars and Traces



Cross Section: Carbine Resource with drilltraces and mineralisation interp



JORC Code, 2012 Edition – Table 1 Report
Paradigm Deposit – 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using a combination of Reverse Circulation (RC), Rotary Air Blast (RAB) and Diamond (DD) drilling. RAB drilling was used in areas with no other drilling, where mineralisation is suspected. No area using RAB drilling was included in Resource estimations. Face sampling (FS) was conducted during underground mining, however to date have not been validated. Data has been used as a guide for interpretation, however not included in the estimation.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. Diamond core was placed in core trays for logging and sampling. Half core samples were nominated by the geologist from diamond core with a minimum sample width of either 20cm (HQ) or 30cm (NQ2).
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	RC sampling was split using a rig mounted cone splitter to deliver a sample of approximately 3Kg DD drill core was cut in half using an automated core saw, where the mass of material collected will vary on the hole diameter and sampling interval. All samples were delivered to a commercial laboratory where they were dried, crushed to 95% passing 3mm if required, at this point large samples may be split using a rotary splitter, pulverisation to 95% passing 75µm, a 50g charge was selected for fire assay.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Both RC and Diamond Drilling techniques were used at the Paradigm project. Diamond drill holes completed pre-2014 were predominantly NQ2 (50.5mm). All Resource definition holes completed post 2014 up to 2016 were drilled using HQ (63.5mm) diameter core. 2017 drill holes have been predominately HQ from surface with NQ tails. Core was orientated using the Reflex ACT Core orientation system. RC Drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. In limited cases RC pre-collars were drilled followed by diamond tails. Pre-collar depth was to 180m or less if approaching known mineralization.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Moisture content and sample recovery is recorded for each RC sample.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	RC drilling contractors adjust their drilling approach to specific conditions to maximize sample recovery. No recovery issues were identified during 2014-2017 RC drilling. Recovery was poor at the very beginning of each hole, as is normal for this type of drilling in overburden. For diamond drilling the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	No relationship or bias has identified between grade and sample recovery.
Logging	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.	All diamond core is logged for Regolith, Lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones. RC sample chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	In all instances, the entire drill hole is logged.

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Diamond core is cut using an automated core saw. In most cases, half the core is taken for sampling with the remaining half being stored for later reference.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. All samples were intended and assumed to be dry, moisture content was recorded for every sample.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Preparation of NSR samples was conducted at Genalysis and Minanalytical preparation facilities, commencing with sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Samples are jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverized to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g Pulp subsamples are then taken with an aluminium scoop and stored in labelled pulp packets. The sample preparation is considered appropriate for the deposit.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Procedures are utilised to guide the selection of sample material in the field. Standard procedures are used for all process within the laboratory. Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size.
	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.	Field duplicates were taken for RC samples on a ratio of 1 in 20. Umpire sampling programs are carried out on an ad-hoc basis.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	The sample sizes are considered appropriate for the material being sampled.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50gm FIRE assay charge is used with a lead flux in the furnace. The prill is totally digested by HCl and HNO_3 acids before Atomic Absorption Spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples. The insertion points are selected at random, except where high grade mineralisation is expected. In these cases a Blank is inserted after the high grade sample to test for contamination. Results greater than 0.2gpt if received are investigated, and re-assayed if appropriate. New pulps are prepared if anomalous results cannot be resolved. Barren flushes are regularly inserted after anticipated high gold grades at the pulverising stage. Field Duplicates are taken for all RC samples and submitted for analysis based on a range of primary assay results skewed towards anomalous gold grades. No Field duplicates are submitted for diamond core. No bias has been established through the use of these procedures.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent person to be signed off.
	The use of twinned holes.	No Twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging is directly entered into an Acquire database. Assay files are received in csv format and loaded directly into the database by the project's responsible geologist with an Acquire importer object. Hardcopy and electronic copies of these are stored.
	Discuss any adjustment to assay data.	No adjustments are made to this assay data.
Location of data points	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.	A planned hole is pegged using a Differential GPS by the field assistants. The final collar is picked up after hole completion by Cardno Survey with a Differential GPS in the MGA 94_51 grid.

Criteria	JORC Code explanation	Commentary
		During drilling single-shot surveys are every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system which measures the gravitational dip and magnetic azimuth results are uploaded directly from the Reflex software export into the Acquire database.
	Specification of the grid system used.	Collar coordinates are recorded in MGA94 Zone 51.
	Quality and adequacy of topographic control.	The Differential GPS returns reliable elevation data which has been confirmed against a high resolution Digital Terrain Model survey performed by Arvista in 2015.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing across the area varies from approximately 20m to 100m spacing.
	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.	Resource definition drilling spacing was typically 40m x 40m, to allow the Resource to be upgraded to indicated. Surrounding exploration drilling can be spaced up to 200m apart.
	Whether sample compositing has been applied.	Sample data is composited before grade estimation is undertaken.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The orientation of the historically mined ore bodies is well known and suggests drilling direction is perpendicular to the orientation of mineralisation. The unexploited ore body has been extensively drilled, confirming a perpendicular drill direction.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits have been undertaken for the drill holes at this stage.

Section 2 Reporting of Exploration Results

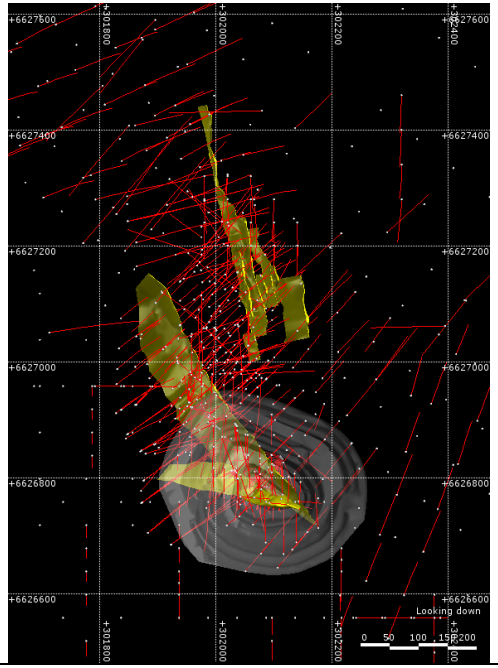
(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All drilling in this report are located within Mining Lease M16/548 which is owned by Kundana Gold Pty Ltd, a wholly owned subsidiary of Northern Star Resources. There are no private royalty agreements applicable to this tenement.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The Carbine - Paradigm area has been explored since the late 1800's. Numerous companies, including BHP, Newcrest, Centaur Mining, Goldfields Exploration, Placer Dome and Barrick have been active in the area. The Paradigm deposit was discovered by Goldfields Exploration via aircore drilling in the late 1990's.
Geology	Deposit type, geological setting and style of mineralisation.	The Carbine area is northern extension of the regionally significant Zuleika Shear Zone. The tenements are in the Norseman-Wiluna Archaean greenstone belt in the Eastern Goldfields province of the Yilgarn Craton, Western Australia. Gold mineralisation in the Zuleika Shear Zone and adjacent greenstone sequences occurs in all rock types, although historical and recent production is dominated by two predominant styles: Brittle D2 faults with laminated (multiple crack-seal) quartz veining containing gold and trace base metal sulphides (galena, sphalerite, chalcopyrite, scheelite), Brittle quartz vein stockwork developed within granophyric gabbro within the Powder Sill

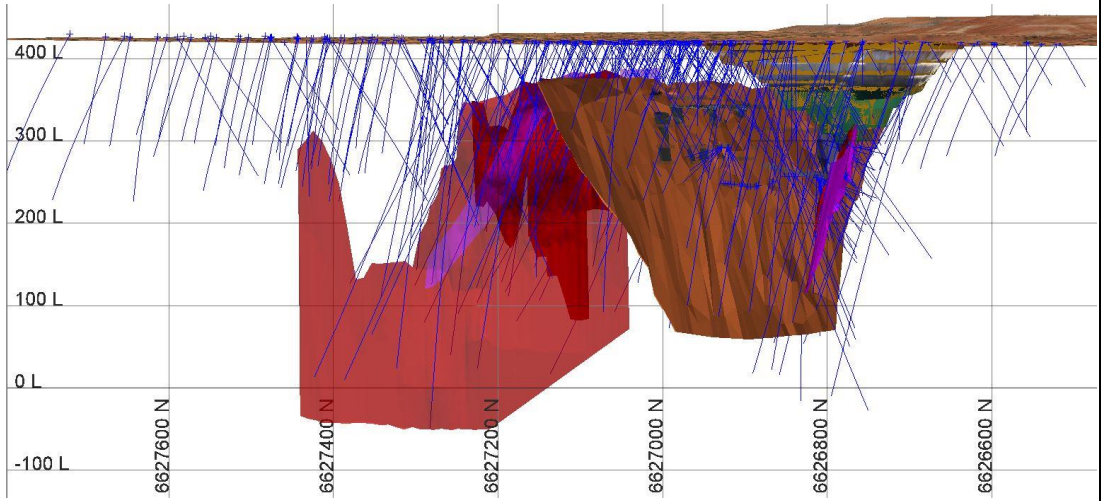
Criteria	JORC Code explanation	Commentary
		At the Paradigm deposit, gold is hosted in veins and disseminated sulphides associated with shearing along the large scale Lincancunbur fault and adjacent fine grained stratigraphic horizons
Drill hole Information	A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too numerous to present here. The Paradigm Resource is based predominantly on historic validated drilling with the addition of recent drilling to validate, infill and extend.
	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.	Exclusion of the drill information will not detract from the understanding of the report.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	All reported assay results have been length weighted to provide an intersection width. A maximum of 2m of barren material between mineralized samples has been permitted in the calculation of these widths. Typically grades over 1.0gpt are considered significant, however, where low grades are intersected in areas of known mineralisation these will be reported. No top-cutting is applied when reporting intersection results.
	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.	Where an intersection incorporates short lengths of high grade results these intersections will be reported in addition to the aggregate value. These will typically take the form of ##.#m @ ##.##gpt including ##.#m @ ##.##gpt.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values have been used for the reporting of these exploration results.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	True widths have been calculated for intersections of the known ore zones, based on existing knowledge of the nature of these structures.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Both the downhole width and true width have been clearly specified when used.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Denoted in the drill results table where applicable.
Diagrams	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.	Appropriate plans and section have been included in the body of this report
Balanced reporting	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.	Both high and low grades have been reported accurately, clearly identified with the drill hole attributes and 'From' and 'To' depths.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No other material exploration data has been collected for this area.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further drilling is planned to target extensions.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Appropriate diagrams accompany this release.

PARADIGM DEPOSIT - REPRESENTATIVE PLAN AND CROSS SECTION

Plan view: Paradigm Resource drill collars and Traces



Long Projection: Paradigm Resource with drilltraces and mineralisation interpretation



Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Northern Star personnel have validated the database during the interpretation of the mineralisation, with any drill holes containing dubious data excluded from the MRE. All face data has been excluded.
	Data validation procedures used.	Data validation processes are in place and run upon import into the database to be used for the MRE in Vulcan v9.1 by Mining Plus.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	MP have not undertaken a site visit, although the Northern Star personnel liaised with during the MRE process and responsible for the mineralisation interpretation have been to site and reviewed the core for this deposit.
	If no site visits have been undertaken indicate why this is the case.	Not applicable.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The geological interpretation is considered robust due to the nature of the mineralisation and that portions of the deposit have been developed along and mined.
	Nature of the data used and of any assumptions made.	Underground development mapping and sampling along with diamond drill core lithology, structure, alteration and mineralisation logs have been used to generate the mineralisation model. The primary assumption is that the mineralisation is hosted within structurally controlled quartz veins, which is considered robust.

Criteria	JORC Code explanation	Commentary
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	Due to the close spaced nature of the data from the historic mining and the consistency of the structure conveyed by this dataset, no alternative interpretations have been considered; however, the removal of internal dilution could significantly change the Mineral Inventory of Paradigm.
	The use of geology in guiding and controlling Mineral Resource estimation.	The mineralisation interpretation is based on a combination of logged quartz percentage or structure and assays.
	The factors affecting continuity both of grade and geology.	The structure is considered to be continuous over the length of the deposit with either quartz or the controlling structure used to guide this interpretation. The grade continuity is not as consistent and as such, the mineralisation has been sub-domained based on consistent grade zones, with these sub-domains used as hard boundaries during the estimation.
Dimensions	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.	The Paradigm Deposit has three lode orientations, Mishka WNW, Natasha NW and Arina NNW. Mishka comprises 2 sub-parallel lodes, the largest of which is approximately 260m along strike, 180m down dip with a width ranging from 1 to 10m. Natasha comprises 2 sub-parallel lodes the largest of which is approximately 500m along strike, 300m down-dip with a width ranging from 1 to 8m. Arina comprises numerous lodes which all strike NNW and range from 50 to 400m along strike, 50m to 100m down-dip and range from 2 to 10m across-dip.
Estimation and modelling techniques	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.	Grade estimation of gold has been completed using Ordinary Kriging (OK) for 14 domains and Inverse Distance squared (ID2) for the 2 supergene domains using Maptek Vulcan 10.0.4 software. Variography has been undertaken by domain where enough data exits. In domains with too few data points, variography parameters have been derived by grouping domain data or has been borrowed from similarly orientated domains.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	No check estimates or previous estimates are available for comparative analysis.
	The assumptions made regarding recovery of by-products.	No assumptions have been made regarding recovery of any by-products.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements have been considered and therefore estimated for this deposit.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The data spacing varies considerably within the deposit ranging from close spaced 20 m (along strike) to 25 m (down dip) spacing through to 75 m (along strike) to 100 m (down dip) spacing and greater. The parent block size of 20 m (X) by 20 m (Y) by 10m (Z) has been used with a sub-block size of 0.25 m (X) by 0.25 m (Y) by 0.25 m (Z) with the gold grades estimated at the parent block scale. ID2 has been used to estimate the two supergene domains; whereas all other domains have been estimated using OK. Supergene ID^2 • Pass 1 estimations have been undertaken using a minimum of 5 and a maximum of 20 samples into a search ellipse of 30 m (Dir 1) by 30 m (Dir 2) by 8 m (Dir 3) with a maximum of five samples from each drill hole allowed. • Pass 2 estimations have been undertaken using a minimum of 5 and a maximum of 20 samples into a search ellipse of 60 m (Dir 1) by 60 m (Dir 2) by 16 m (Dir 3) with a maximum of five samples from each drill hole allowed. • Pass 3 estimations have been undertaken using a minimum of 3 and a maximum of 20 samples into a search ellipse of 60 m (Dir 1) by 60 m (Dir 2) by 16 m (Dir 3) with no drill hole limit applied. Fresh OK • Pass 1 estimations have been undertaken using a minimum of 6 and a maximum of 25 samples into a search ellipse of 40 m (Dir 1) by 20 m (Dir 2) by 15 m (Dir 3) with a maximum of three samples from each drill hole allowed. • Pass 2 estimations have been undertaken using a minimum of 6 and a maximum of 25 samples into a search ellipse of 60 m (Dir 1) by 30 m (Dir 2) by 20 m (Dir 3) with a maximum of three samples from each drill hole allowed. • Pass 2 estimations have been undertaken using a minimum of 3 and a maximum of 25 samples into a search ellipse of 60 m (Dir 1) by 30 m (Dir 2) by 20 m (Dir 3) with no drill hole limit. The search ellipses and variography rotation applied during the estimation of Domains 3010 and 4010 blocks has been determined by the orientation of the hangingwall and footwall contacts through the use of the dynamic anisotropy function in Maptek Vulcan v10.0.4.

Criteria	JORC Code explanation	Commentary
		All other domains have been estimated using singly oriented search ellipses and variograms orientations.
	Any assumptions behind modelling of selective mining units.	No selective mining units are assumed in this estimate.
	Any assumptions about correlation between variables.	No other elements other than gold have been estimated.
	Description of how the geological interpretation was used to control the Resource estimates.	The mineralisation wireframes supplied by Northern Star have been sub-domained in consultation with Northern Star based on orientation and grade, with these sub-domains used to flag the drill hole intercepts in the database. These flagged intercepts have then been used to create composites in Maptek Vulcan v9.1 using a residual of 0.1 m. The composite length is 1 m in all data. The composites have been length weighted during the estimation to account for the different composite lengths used.
	Discussion of basis for using or not using grade cutting or capping.	The influence of extreme sample distribution outliers in the composited data has been reduced by top-cutting where required. The top-cut levels have been determined using a combination of histograms, log probability and mean variance plots. Top-cuts have been reviewed and applied for the grouped estimation domains.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Model validation has been carried out, including visual comparison between declustered composites and estimated blocks; check for negative or absent grades; statistical comparison against the input drill hole data and graphical plots.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	The tonnes have been estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	For Mineral Resources, the cut-off grade (COG) is generated using an A$1,750 gold price. Costs incorporated in the COG are built from first principals, based either on actual cost history or budgeted estimates. For Resources in active mine areas, a variable COG has been used for the Resource estimate. The Variable costing is defined as all directly incurred costs involved in the development and extraction of the ore panel (e.g., drill & blast, haulage, processing, refining and royalties on sales.). The variable COG does not include capital development or fixed costs (i.e., costs not directly associated with extraction, processing and selling gold) that would be absorbed by the existing Reserve base.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The interpretation of mineralisation is independent of mining considerations. After modelling, the software 'Mineable Shape Optimiser' is used to generate optimal mining shape based on a 2m minimum mining width, and variable costing Cut-off grade at the A$1,750 gold price. Any isolated MSO shapes unlikely to be economic are removed from the estimated Resource. The Resource reported is the Measured, Indicated & Inferred material within the MSO shape generated.
Metallurgical factors or assumptions	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.	No metallurgical or recovery assumptions have been made during the MRE.
Environmental factors or assumptions	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 green fields 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.	No environmental assumptions have been made during the MRE.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density values have been applied based on the degree of weathering which has been coded into the model. The values used have been obtained from a previous MRE for the Barkers Deposit. No information has been provided on the number of measurements or method used to obtain these values.

Criteria	JORC Code explanation	Commentary
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	Bulk density was calculated by standard displacement methods.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities were assigned based on weathering properties of the rock.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	The Resource classification has been applied to the MR estimate based on the drilling data spacing, grade and geological continuity, and data integrity, with input from NSR personnel.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	The classification considers the relative contributions of geological and data quality and confidence, as well as grade confidence and continuity.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The classification reflects the view of the Competent Person.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Mineral Resource estimate for the combined Paradigm Deposit has not been audited by an external party.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC code.
	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.	The statement relates to global estimates of tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Historic production records are incomplete, so no comparison or reconciliation has been made.

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Reported Ore Reserve is based on an updated Mineral Resource for the Paradigm area. This Mineral Resource has been prepared by independent consultants Mining Plus Pty Ltd to JORC 2012 standard and is being announced concurrently with this Ore Reserve.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	Mineral Resources are reported inclusive of ore Reserves.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The Competent Person has visited the site.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	The Ore Reserve is underpinned by mining studies conducted to a Pre-Feasibility Study level. Modifying factors accurate to the study level have been applied based on detailed stope design analysis. Modelling indicates that the resulting mine plan is technically achievable and economically viable.

Criteria	JORC Code explanation	Commentary
	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.	Pre-feasibility study completed.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Cut-off grades were determined based on an ex-royalty gold price of AU$1,500/oz. Mining costs for cut-off grade estimation were sourced from relevant detailed modelling for similar projects in the mining district. Processing costs were sourced from NST based on recent agreements.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Cut-off grades and geotechnical inputs were used to apply mathematical optimisation algorithms on the Mineral Resource to identify economic areas. Detailed underground mine designs were then carried out on the deposit incorporating the optimisation results, and these were used as the basis of the Ore Reserve estimate.
	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.	The Ore Reserve is planned to be mined using a top-down mechanised long hole open stoping method, with in-situ pillars left unmined for support. Diesel powered trucks and loaders will be used for materials handling. Diesel-electric jumbo drill rigs will be used for development and ground support installation, and diesel-electric long hole rigs used for production drilling. The mining method chosen is well-known and widely used in the local mining industry, and production rates and costing can be predicted with a suitable degree of accuracy. The method has been chosen based on the spatial characteristics of the orebody, geotechnical analysis, and location of the mine. Suitable access will be available through the existing open pit and underground workings, which are currently being dewatered. Allowance has been made for rehabilitation of ground support in the previously mined workings. Significant water bearing structures are known to exist in the mining area. Water inflows to the underground mine are expected to be significant (> 40 L/s). A system of dewatering bores with a capacity of up to 120 L/s, in addition to a mine dewatering system of up to 80 L/s capacity, has been allowed for in the mine plan.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	Independent geotechnical consultants Dempers and Seymour Pty Ltd contributed appropriate geotechnical analyses to a suitable level of detail. These form the basis of mining method selection, mine design, mining factors, and ground support design for the Ore Reserve estimate.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	The Mineral Resource model used for stope optimisation was the Paradigm Resource reported concurrent with this Ore Reserve. Stope economics were determined using the cut-off grade revenue and cost inputs. A minimum stoping width of 1.0 m with a dilution skin of 0.5 m on each contact was applied, making a minimum void width of 2.0 m. A sub-level interval of 20 m, and stope section strike length of 5.0 m, were also applied.
	The mining dilution factors used.	A dilution skin of 0.5 m was applied on each contact for a total dilution width of 1.0 m. The grade of this dilution was determined based on the Mineral Resource contained within this skin.
	The mining recovery factors used.	A 95% mining recovery factor was applied to all stoping. Mining Recovery was also reduced based on half-height rib pillars and 4.0 m thick sill pillars, placed as required by the geotechnical analysis and to avoid down-dip migration of local failures. Ore development had an assumed 100% mining recovery, based on historical experience and industry standards.
	Any minimum mining widths used.	A pre-dilution minimum mining width of 1.0 m was assumed. This results in a minimum void width of 2.0 m for stoping when combined with the dilution estimate.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Only the Indicated portion of the Mineral Resource was used to estimate the Ore Reserve. Any Inferred material contained within the Ore Reserve design had grade set to zero for the purposes of optimisation and evaluation. The Ore Reserve is technically and economically viable without the inclusion of Inferred Mineral Resource material.

Criteria	JORC Code explanation	Commentary
	The infrastructure requirements of the selected mining methods.	The Ore Reserve mine plan will require installation of infrastructure including electrical power (supply, transmission, and distribution), water and compressed air supply, offices, ablutions, workshops, surface magazines and ventilation infrastructure. A dewatering system to the near-by Carbine Pit is currently operational and this will also require expansion for the works. Allowance has been made for supply and installation of this expanded infrastructure, including dewatering bores. Additional allowance has been made for transfer of water to other nearby inactive pits. Based on information provided to the Competent Person by NST, there is currently no reason to believe that these pits would not be made available for additional water storage (if required) during the Ore Reserve mine plan. Processing will be conducted offsite. Allowance has been made for upgrade of the haul route to the processing plant.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	Metallurgical testing carried out by NST to an appropriate level of detail indicates that the ore can successfully be treated using conventional gravity separation and carbon-in-leach (CIL) processes. There are several processing plants in the district, including the NST-owned Kanowna Belle facility, capable of processing the ore. The current Ore Reserve plan model's treatment at a third-party processing plant located approximately 60 km from the mine.
	Whether the metallurgical process is well-tested technology or novel in nature.	The proposed process is well-tested and widely used.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Metallurgical test work was carried out by NST at the Kanowna Belle laboratory on representative samples for the portion of the Paradigm deposit contained within the Ore Reserve design. The metallurgical recovery factor determined during the test work was 97.7%. This correlates with test work undertaken at the Paddington Gold laboratory in the late 1990's.
	Any assumptions or allowances made for deleterious elements.	No problematic levels of deleterious elements were detected during the test work.
	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.	The ore was successfully processed previously at the Paddington Gold processing plant.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable, gold only.
Environmental	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.	The environmental permitting process for the mine has not yet commenced. Based on current data available, the Competent Person considers that environmental permitting does not present a significant risk to the potential for extraction of the Paradigm Ore Reserve as: The Paradigm deposit is contained within a previously mined area (operational in the late 1990's to early 2000's); and The NST metallurgical testing indicated that the rock mass is considered to have very low acid forming potential.
Infrastructure	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.	The Ore Reserve mine plan will require installation of infrastructure including electrical power (supply, transmission, and distribution), water and compressed air supply, offices, ablutions, workshops, surface magazines and ventilation infrastructure. A dewatering system to the near-by Carbine pit is currently operational and this will also require expansion for the works. Allowance has been made for supply and installation of this infrastructure. Suitable flat terrain exists for installation of all required infrastructure and the Competent Person sees no reason this infrastructure could not be installed at the site. Access to the site is via existing, well-maintained and gazetted roads. Allowance has been made for upgrade of the ore haul route to the processing plant. Waste material will be dumped against the existing Paradigm waste dump. The existing run-of-mine (ROM) pad will require some clearing and levelling before use. Labour will be sourced from Kalgoorlie on a residential basis. Sufficient water will be available for operations through normal mine dewatering activities.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Capital costs have been based on relevant supplier and contractor quotes for similar operations within the mining district.

Criteria	JORC Code explanation	Commentary
	The methodology used to estimate operating costs.	Mining operating costs have been based on relevant supplier and contractor quotes for similar operations within the mining district. Processing and ore haulage costs have been provided by NST based on previous agreements around toll treatment at the third-party plant. General and administration costs have been supplied by NST based on operational results. A spreadsheet model detailing capital and operating costs and has been used to complete a life of mine cash flow estimate.
	Allowances made for the content of deleterious elements.	No allowance made as no deleterious elements are expected, based on metallurgical test work.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of AU$1,500 per ounce per NST corporate guidance. The Competent Person considers this to be an appropriate commodity price assumption.
	The source of exchange rates used in the study.	All costs and revenues have been estimated in Australian dollars. No exchange rate adjustments were required.
	Derivation of transportation charges.	All ore transportation charges are based on supplier quotes. This cost component has been used to determine the cut-off grades as well as applied to the operating cash flow estimate.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Processing costs are based on data supplied by NST, with various processing options available in the local area.
	The allowances made for royalties payable, both Government and private.	A Western Australian State Government royalty of 2.5% has been applied.
Revenue factors	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.	Forecasts for head grade delivered to the plant are based on detailed mine plans and mining factors. Revenue has been based on the commodity price and exchange data provided by NST. Single commodity pricing for gold only, using a long-term gold price of A$1,500 per ounce, with a 2.5% WA State Government royalty.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	The assumed gold price is per NST Corporate Guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	Gold doré from the mine is to be sold at the Perth mint at spot price.
	A customer and competitor analysis along with the identification of likely market windows for the product.	N/A.
	Price and volume forecasts and the basis for these forecasts.	N/A.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	N/A.
Economic	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.	The Ore Reserve estimate is based on a financial model that has been prepared at a pre-feasibility study level of accuracy. All inputs from mining operations, processing, transportation and sustaining capital as well as contingencies have been scheduled and evaluated to generate a full life of mine cost model. • Economic inputs have been sourced from suppliers or generated from database information relating to the relevant area of discipline. • A discount rate of 8% has been applied. • The NPV of the project is positive at the assumed commodity price.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivity analysis shows that the project is most sensitive to commodity price/exchange rate movements. The project is still economically viable at unfavourable commodity price adjustments of 10%.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	he mine was previously successfully operated within the last twenty years. The tenements are all in good standing and wholly owned by NST, based on information provided to the Competent Person by NST. The project is located within a traditional mining district and will provide employment for local people. NST will continue to communicate and negotiate in good faith with key stakeholders. It is not expected that there will be any significant impediments to commencement of operations within a reasonable timeframe.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	

Criteria	JORC Code explanation	Commentary
	Any identified material naturally occurring risks.	A formal process to assess and mitigate naturally occurring risks will be undertaken prior to execution. Currently, all naturally occurring risks are assumed to have adequate prospects for control and mitigation.
	The status of material legal agreements and marketing arrangements.	None known. NST wholly owns the project, and intends to sell gold produced from the operation at spot price.
	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.	The permitting process has not yet been commenced for the operation. However; based on the information provided to him, the Competent Person sees no reason all required approvals will not be successfully granted within a reasonable timeframe.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	The Probable Ore Reserve is based on that portion of the Indicated Mineral Resource within the mine designs that may be economically extracted and includes an allowance for dilution and ore loss.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Person's view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	No Measured Mineral Resource contributes to Probable Ore Reserves.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserves reporting processes has been subjected to an internal review by Entech's senior technical personnel in July 2017, as well as Northern Star's technical services department.
Discussion of relative accuracy/ confidence	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.	The design, schedule, and financial model on which the Ore Reserve is based has been completed to a Pre-Feasibility Study standard, with a corresponding level of confidence.
	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.	All modifying factors have been applied to designed mining shapes on a global scale.
	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.	Considerations in favour of a high confidence in the Ore Reserve include: • The mining process is well-known, small scale and utilises proven technology and methods widely used in the local area, with sufficient data to generate adequate costing estimates to pre-feasibility standard. • There exist several processing options in the local area, including the NST-owned treatment plant at Kanowna Belle, which would be suitable for treatment of the ore based on metallurgical test work. • The project was previously operated within the last twenty years. Considerations in favour of a lower confidence in the Ore Reserve include: • Future commodity price forecasts carry an inherent level of risk. • There is a degree of uncertainty associated with geological estimates. The Ore Reserve classifications reflect the levels of geological confidence in the estimates. • There is a degree of uncertainty regarding estimates of impacts of natural phenomena including geotechnical assumptions, hydrological assumptions, and the modifying mining factors, commensurate with the level of study. • Further, i.e. quantitative, analysis of risk is not warranted or considered appropriate at the current level of technical and financial study.
	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.	

JORC Code, 2012 Edition – Table 1
Report EKJV Hornet Open Pit – 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using a combination of Reverse Circulation (RC) and Diamond Drilling (DD). RC drilling was used to drill pre-collars for many of the Resource definition holes with diamond tails. Diamond drilling constitutes the remainder of the drilling.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Diamond core was transferred to core trays for logging and sampling. Half core samples were nominated by the geologist from both NQ2 and HQ diamond core, with a minimum sample width of either 20cm (HQ) or 30cm (NQ2). RC samples were split using a rig-mounted cone splitter on 1m intervals to obtain a sample for assay. 4m Composite spear samples were collected for most of each hole, with 1m samples submitted for areas of known mineralization or anomalism.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Samples were taken to Genalysis Kalgoorlie for preparation by drying, crushing to <3mm, and pulverising the entire sample to <75µm. 300g Pulps splits were then dispatched to Genalysis Perth for 50g Fire assay charge and AAS analysis.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	RC, face sampling, grade control and Diamond Drilling techniques were used at the K2 deposits. Diamond drill holes completed pre-2011 were predominantly NQ2 (50.5mm). All Resource definition holes completed post 2011 were drilled using HQ (63.5mm) diameter core. Core was orientated using the Reflex ACT Core orientation system. RC Drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. 2 RC pre-collars were drilled followed by diamond tails. Pre-collar depth was to 160m or less if approaching known mineralization.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC drilling contractors adjust their drilling approach to specific conditions to maximise sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified in the RC drilling.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For diamond drilling the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	Recovery was excellent for diamond core and no relationship between grade and recovery was observed. For RC drilling, pre-collars were ended before known zones of mineralization and recovery was very good through any anomalous zones, so no issues occurred.
Logging	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.	All diamond core is logged for Regolith, lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	RC sample chips are logged in 1m intervals for the entire length of each hole. Regolith, lithology, alteration, veining and mineralisation are all recorded.
	If core, whether cut or sawn and whether quarter, half or all core taken.	All Diamond core is cut and half the core is taken for sampling. The remaining half is stored for later use.

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a 1m sample 3-4kg in size. These samples were submitted to the lab from any zones approaching known mineralization and from any areas identified as having anomalous gold. Outside of mineralized zones spear samples were taken over a 4m interval for composite sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Sampling quality is deemed appropriate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Field duplicates were taken for RC samples at a rate of 1 in 20.
	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.	Sample preparation was conducted at Genalysis Kalgoorlie, commencing with sorting, checking and drying at less than 110°C to prevent sulphide breakdown. Samples are jaw crushed to a nominal -6mm particle size. If the sample is greater than 3kg a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg (typically 1.5kg) at a nominal <3mm particle size. The entire crushed sample (if less than 3kg) or sub-sample is then pulverised to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g Pulp subsamples are then taken with an aluminium scoop and stored in labelled pulp packets.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Grind checks are performed at both the crushing stage(3mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50g Fire assay charge is used with a lead flux, dissolved in the furnace. The prill is totally digested by HCl and HNO3 acids before Atomic absorption spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples, This is random, except where high grade mineralisation is expected where blanks are inserted after the high grade sample to test for contamination. Failures above 0.2gpt are followed up, and re-assayed. New pulps are prepared if failures remain. Field Duplicates are taken for all RC samples (1 in 20 sample). No Field duplicates are submitted for diamond core.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by a Northern Star geologist during the drill hole validation process, and later by a Competent person to be signed off.
	The use of twinned holes.	No known twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging is captured using a wireless remote Acquire database if there network is available. If network is unavailable, data is entered via a remote licence set up into an offline Acquire database then transferred later into the live database. Both a hardcopy and electronic copy of these are stored, as well as being loaded in to the database using automatic acquire loaders. Assay files are received in csv format and loaded directly into the database by the Database administrator (DBA). A geologist then checks that the results have inserted correctly. Hardcopy and electronic copies of these are stored. No adjustments are made to this assay data.
	Discuss any adjustment to assay data.	
Location of data points	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.	Planned hole locations are pegged using a Differential GPS by the field assistants. The collar positions for underground diamond holes are located by the mine surveyors, During drilling, single-shot surveys are every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system. Upon hole completion, a gyroscopic survey is conducted by ABIMS taking readings every 5m for improved accuracy. Measurements are taken with reference to true north.
	Specification of the grid system used.	All data is collected using the local mine grid.
	Quality and adequacy of topographic control.	Quality topographic control has been achieved through Lidar data and survey pickups of holes over the last 15 years.

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing across the area varies. For Resource definition drilling, spacing was typically 20m x 20m to allow the Resource to be upgraded to an Indicated Resource.
	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.	The data spacing is considered appropriate for Resource and Ore Reserve classification.
	Whether sample compositing has been applied.	No compositing has been applied to these exploration results, although composite intersections are reported.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of the structures in the Kundana camp dip steeply (80°) to WSW. The Mary Fault structure has a shallow dip but orients to the NW, approximately 60°. To target these orientations the drill hole dips of 60-70° towards ~060° achieve high angle intersections on all structures.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits or reviews have recently been conducted on sampling techniques.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All holes mentioned in this report are located within the Mining Lease M16/309 held by The East Kundana Joint Venture (EKJV). The EKJV is majority owned and managed by Northern Star Resources Limited (51%). The minority holding in the EKJV is held by Tribune Resources Ltd (36.75%) and Rand Mining Ltd (12.25%). Mining Lease M16/309 is subject to two royalty agreements. The agreements that are on M16/309 are the Kundana-Hornet Central Royalty and the Kundana Pope John Agreement No. 2602-13.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Since the late 1990's the Hornet area has been drilled heavily, initially by Gilt Edge Mining (GEM) then by Goldfields Exploration Pty Limited who drilled extensively from Hornet all the way to Drake prospects. By 2001-2002, Aurion Gold Pty Limited had undertaken two infill programs totalling 43 DD and 63 RC holes. In 2003, Placer Dome Asia Pacific (PDAP) acquired 100% ownership and undertook infill drilling programmes for the K2, K2A, K2B and the Mary fault mineralisation. By mid-2003, PDAP drilled a grade control program to cover the K2 mineralisation to a depth of 35m below surface. Since 2003 the drilling campaigns around the Hornet project area has ceased until late 2000's when Barrick Gold drilled a few holes around the Mary Fault area.
Geology	Deposit type, geological setting and style of mineralisation.	The Kundana camp is situated within the Norseman-Wiluna Greenstone Belt, in an area dominated by the Zuleika shear zone, which separates the Coolgardie domain from the Ora Banda domain. K2-style mineralisation (Hornet) consists of narrow vein deposits hosted by shear zones located along steeply-dipping overturned lithological contacts. The K2 structure is present along the contact between a black shale unit (Centenary shale) and intermediate volcanoclastics (Spargoville formation). Minor mineralization, termed K2B, also occurs further west, on the contact between the Victorious Basalt and Bent Tree Basalt (both part of the regional upper Basalt Sequence). A shallow dipping fault, offsets the K2 structure at the south end of Hornet. This contact exists as a brecciated material hosting within the intermediate volcanoclastic tuff.

Criteria	JORC Code explanation	Commentary
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically list the complete dataset however a summary report has been collated to reflect the hole positions used for estimation.
	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.	The exclusion of this data will not adversely impact on the understanding of this release.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No exploration drill hole data is being released.
	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.	No exploration drill hole data is being released.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No exploration drill hole data is being released.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No exploration drill hole data is being released.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	No exploration drill hole data is being released.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	No exploration drill hole data is being released.
Diagrams	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.	Appropriate plans and section have been included in the body of this report.
Balanced reporting	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.	No exploration drill hole data is being released.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Metallurgical test work was conducted on 7 hornet holes in 2011 with gold recoveries following cyanidation above 95%. Lime consumption was high and cyanide consumption was low.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Further work will continue in the near future to further attempt to extend the shallow Hornet mineralisation further north towards Rubicon. The drilling extents between Hornet and Rubicon is very sparse.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Future work may be conducted to test the continuity of mineralisation between Hornet and Rubicon.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

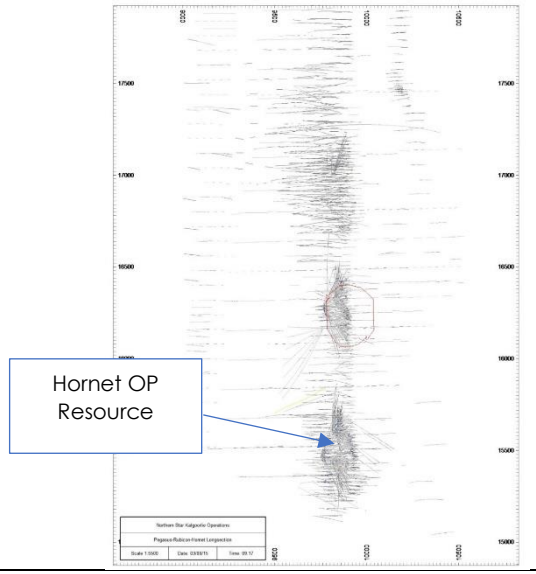
Criteria	JORC Code explanation	Commentary
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	Sampling and logging data is either recorded on paper and manually entered into to an Acquire database, or transferred from a logging laptop into Acquire via an offline database. There are checks in place to avoid duplicate holes and sample numbers.
	Data validation procedures used.	Where possible, raw data is loaded directly to the database from laboratory and survey derived files.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	This Resource estimate has been conducted by geologists working in the exploration department and in direct, daily contact with the ore body data used in this Resource estimate.
	If no site visits have been undertaken indicate why this is the case.	Multiple site visits undertaken by geologists supervising the drilling programs and preparing the geological interpretation.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource. The confidence in the geological interpretation is high with the information gained from ore development and underground drilling.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drill holes, 3D photogrammetry, structures.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed.
	The use of geology in guiding and controlling Mineral Resource estimation.	The interpretation of the main K2 structure is based on the presence of quartz veining and continuity between sections on the K2 structure. Drill core logging and face development mapping is used to create 3D constrained wireframes.
	The factors affecting continuity both of grade and geology.	Continuity is affected by the orientation of the K2 structure, and several dextral offset fault structures
Dimensions	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.	Strike length = > 600m; Width = ~1-2m average; Depth = from surface to ~500m maximum below surface.
Estimation and modelling techniques	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.	The K2 domain mineralisation was subdivided into three zones to separate the main high grade core and the low grade Hanging wall and footwall alteration halos. The K2 core was defined by the presence of quartz, the alteration zones were constrained based on grade. 3 dimensional wireframes were created in Datamine Studio to define the volumes for the mineralised domains. Simple Kriging was used to estimate the Hornet Resource. Drill holes were composited into 1m intervals down hole except for the supergene domains which were composited to 2m. The composite lengths could vary between 0.5m and 1.5m to ensure that no sampling was lost during the compositing process. The average grade and total length of the composite data was compared against the average grade and total length of the un-composited data to check the compositing process. The distribution of composite lengths was checked to ensure that most the composites were close to the targeted length. The local mean value used for Simple Kriging was calculated from the declustered mean of the top-cut composited sample data. Search distances used for estimation based on variogram ranges and vary by domain. Drill spacing is generally around 20m x 20m for the Indicated Resource and around 40m x 40m for the Inferred Resource. Top-cuts were applied to the sample data based on a statistical analysis of the data and vary by domain. The Kriging neighbourhood was refined using statistical measures of Kriging quality. The estimated grades were assessed against sample grades and against declustered mean values
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Post estimation, Resource estimations do not have tonnage or grade factors applied.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.

Criteria	JORC Code explanation	Commentary
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Parent cell size is 10m x 10m x 10m. Sub-cell to 2.5m x 2.5m to suit the narrow north-south orientation of the majority of the domains. Search ellipsoids vary for each domain but are typically around 50 – 100m down plunge, 50m across plunge and 5m perpendicular to plunge.
	Any assumptions behind modelling of selective mining units.	No assumptions made.
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill logging, face samples, and grade. Low grades can form part of an ore wireframe.
	Discussion of basis for using or not using grade cutting or capping.	Top-cuts were applied to the composited sample data with the intention of reducing the impact of outlier values on the average grade. Top cuts were selected based on a statistical analysis of the data with a general aim of not impacting the cut mean by more than 5%. Values selected range from 5gpt to 150gpt and vary by domain.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Validation is through swath plots comparing composites to block model grades, along 20m eastings and RL. Visual checks were also made comparing model grades against the supporting sample data.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Cut-off grades for reporting the Resource were developed using a gold price of A$1,700 per ounce and budgeted mining costs for 2015/16.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	Historical mining and reconciliation data does not affect wire frame interpretation.
Metallurgical factors or assumptions	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.	Metallurgical recovery factors have been developed based on extensive experience processing similar material from the Kundana area.
Environmental factors or assumptions	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 green fields 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.	A "Licence to Operate" is held by the operation which is issued under the requirement of the "Environmental Protection Act 1986", administered by the Department of Environment (DoE). The licence stipulates environmental conditions for the control of air quality, solid waste management, water quality, and general conditions for operation. Groundwater licenses are held for water abstraction, including production bore field water use for mineral processing, and mine dewatering, in accordance with the Rights in Water and Irrigation Act 1914. These licenses are also regulated by DoE and are renewable on a regular basis. Kanowna Operations conduct extensive environmental monitoring and management programs to ensure compliance with the requirements of the licences and lease conditions. An Environmental Management System is in place to ensure that Northern Star employees and contractors exceed environmental compliance requirements. The Kalgoorlie operations are fully permitted including groundwater extraction and dewatering, removal of vegetation, mineral processing, and open pits. Kalgoorlie Operations have been compliant with the International Cyanide Management Code since 2008.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density was determined from surface diamond drill holes with intervals taken from mineralized and non-mineralised zones within the project area. The bulk densities are derived from wet and dry weighting of core no greater than 30cm total length with core samples selected by changes in lithology/alteration or every 30-40m where no change is evident.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones.

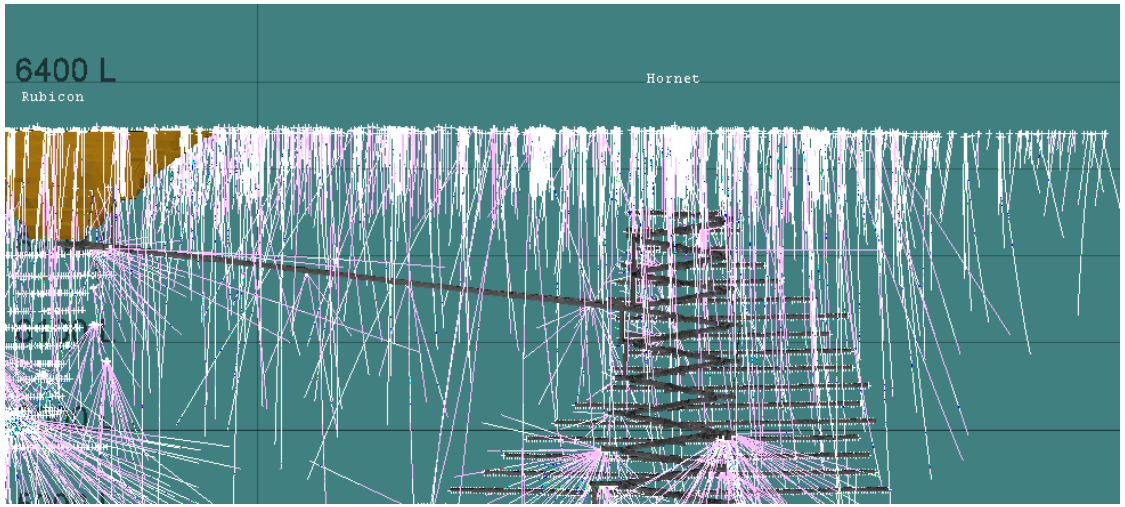
Criteria	JORC Code explanation	Commentary
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities are applied to domains for the ore zone and interpreted weathering domains
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on a series of factors including: Geologic grade continuity Density of available drilling Statistical evaluation of the quality of the kriging estimate
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	All considered
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This mineral Resource estimate is considered representative.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Resource has not been audited externally. Previous estimates of this area utilising the same, or very similar variables, have been reviewed by internal parties with protocols deemed appropriate.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This mineral Resource estimate is considered as robust and representative of the Kundana style of mineralisation. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource.
	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.	This Resource report relates to the entirety of the K2 ore zone and surrounding dilution skins. Each of these will show local variability even though the global estimate reflects the total average tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No comparison with production data has been made.

HORNET - REPRESENTATIVE PLAN AND CROSS SECTION

Plan view: Hornet O/P Resource drill collars and Traces



Long Section: Hornet surface Resource area with drill traces



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Reported Ore Reserve is based on updated or depleted Resource models for all areas of Rubicon/Hornet.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	Mineral Resources are reported inclusive of Ore Reserves.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	No site visit has been conducted by the Competent Person.
	If no site visits have been undertaken indicate why this is the case.	Site visits have been conducted by multiple personnel involved in the project from NST. The Competent Person is satisfied that the descriptions of the planned infrastructure and locality provided by NST along with the surveyed 3D topography are sufficient information to carry out the mine design and classify the Ore Reserves.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	Pre-Feasibility.
	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.	As above.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Cut-off grades were determined based on unit costs from the "pre-feasibility level" mining cost model. Costs have been sourced from contractor quotes based on a mine of similar size.

Criteria	JORC Code explanation	Commentary
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Ore Reserves have been calculated by generating detailed mining shapes for the proposed open pit. All open pit mining shapes include planned and unplanned dilution, being waste material that is located within the minable shape. Open pit unplanned dilution has been modelled within the mining shapes as a skin of material likely to be taken additional to material considered to be the smallest mining unit (SMU). This method is considered to be appropriate given the expected ground conditions, orebody width and proposed mining style.
	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.	The selected mining methods for the Hornet deposit are of a bench mining open pit method. The proposed open pit is to be mined using conventional open pit mining methods (drill, blast, load and haul) by a mining contractor utilising 120 t class excavators and 90 t trucks. This method is used widely in mines across Western Australia and is deemed appropriate given the mature of the ore body.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	Pit wall slopes are based on recommendations provided by Barrick geotechnical reviews and based upon expected rock type, weathering profile and depth below surface.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	The mineral Resource supplied by NST has been used for the open pit optimisation. To generate a series of 'nested' pit shells, a series of inputs are required to sufficiently estimate the value of the material being mined and the cost of extraction. The optimisation requires an economic value for each block in the model, as well as mining and milling costs. The cost of each block is derived from mining and processing costs, with the mining cost related to the block depth and the milling cost only being used if the block can be economically mined. Mining costs were based on quoted rates from a surface mining contractor for similar scaled operations. Revenue assumptions have been provided by Northern Star.
	The mining dilution factors used.	Physicals are reported within the generated mining shapes for the open pit Ore Reserve. SMU shapes have been generated for the reporting of Ore Reserve physicals. Dilution accounted for within the SMU is 18%; that is waste material carried within the mining shape. Mining recovery is considered to be 100% of the SMU.
	The mining recovery factors used.	No recovery factors were applied.
	Any minimum mining widths used.	The SMU dimensions for the Ore Reserve Estimate are 2.0 m Wide x 5.0 m High x 5.0 m Long.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Inferred material has not been included within this Ore Reserve estimate (treated as waste) but has been considered in LOM planning. It is assumed that Inferred material will be converted to Ore Reserve via grade control drilling which has been provided for and will be carried out ahead of mining.
	The infrastructure requirements of the selected mining methods.	Infrastructure required for the proposed Hornet Open Pit have been accounted for and included in all work leading to the generation of the Ore Reserve estimate. As there is currently infrastructure in place for the Rubicon/Hornet underground operations and the life of the project is limited planned infrastructure includes: • Offices, workshops and associated facilities; • Dewatering pipeline; • Access Road; • Waste Dump; and • RoM Pad. Processing will be conducted offsite at NST Konawa Bell operation; hence no processing infrastructure is required.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	Ore from the Hornet Open Pit operations is treated at the NST owned Kanowna Belle processing facility located adjacent to the Kanowna Belle mine. The plant is designed to handle approximately 1.8 million tonnes of feed per annum and has the capability to treat both refractory and free milling ores through the flotation circuit and associated concentrate roaster circuit, including carbon-in-leach (CIL) gold recovery, or bypassing the flotation circuit and going directly to a CIL circuit that is designed to treat flotation tails. Ore from the Rubicon/Hornet underground operations is currently processed at the Kanowna Bell facility.
	Whether the metallurgical process is well-tested technology or novel in nature.	Well tested for surface and underground ore.

Criteria	JORC Code explanation	Commentary
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Metallurgical test work was carried out by ALS Ammtec on representative samples for the Hornet deposit. Based on current information provided by NST from Kanowna Bell metallurgical recovery factors are as follows: • Oxide – 94%; • Transitional – 94%; • Fresh – 94%.
	Any assumptions or allowances made for deleterious elements.	There has been no allowance for deleterious elements.
	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.	Metallurgical test work was carried out by ALS Ammtec on representative samples for the Hornet deposit.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable, gold only.
Environmental	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.	Environmental impacts and hazards are being considered as part of the DOIR application process. Waste rock characterisation and hydrogeological investigations indicates the rock mass is considered non-acid forming. Tailings from the open pit operation are proposed to be stored within the existing Tailings Storage Facility (TSF) at Kanowna Bell. A previously granted clearing permit has expired. This will be re-applied for and expected to be granted closer to expected start of the pit.
Infrastructure	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.	There is currently infrastructure in place for the Rubicon/Hornet underground operations. Additional infrastructure is planned for the planned Hornet operations. TSF facilities are located Kanowna Belle processing facility located adjacent to the Kanowna Belle mine. It has been assumed that all development of surface infrastructure will be completed to enable to development of the Hornet Open Pit Resource. It has been assumed that there will be sufficient water available to develop the Project.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Capital and operating costs have been sourced from supplier and contractor quotes as well as Entech's cost database through the "pre-feasibility study" process.
	The methodology used to estimate operating costs.	A capital and operating cost model has been developed and has been used to complete a life of mine cash flow estimate.
	Allowances made for the content of deleterious elements.	Nil allowance, none expected.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of A$1,500 per ounce as per NST corporate guidance.
	The source of exchange rates used in the study.	NST report in Australian dollars. Therefore, no exchange rate is used or required.
	Derivation of transportation charges.	All transportation charges are based supplier and contractor quotes. This cost component has been used to determine the cut-off grades as well as applied to the operating cash flow estimate.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Processing costs are based on data supplied by NST. This cost component has been used to determine the cut-off grades as well as applied to the operating cash flow estimate.
	The allowances made for royalties payable, both Government and private.	WA State Government royalty of 2.5%. This cost component has been used to determine the cut-off grades as well as applied to the operating cash flow estimate.
Revenue factors	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.	Revenue has been based on the commodity price and exchange data provided by NST. Single commodity pricing for gold only, using a long-term gold price of A$1,500 per ounce. 2.5% WA State Government royalty.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.

Criteria	JORC Code explanation	Commentary
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	Gold doré from the mine is to be sold at the Perth Mint.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not applicable.
	Price and volume forecasts and the basis for these forecasts.	Not applicable.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not applicable.
Economic	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.	The Ore Reserve estimate is based on a financial model for that has been prepared at a "pre-feasibility study" level of accuracy economic modelling. All inputs from mining operations, processing, transportation and sustaining capital as well as contingencies have been scheduled and evaluated to generate a full life of mine cost model. Economic inputs have been sourced from suppliers or generated from database information relating to the relevant area of discipline. A discount rate of 0% has been applied. The NPV of the project is strongly positive at the assumed commodity prices.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities were conducted on metal price fluctuations of A$1,500 ± $200 per ounce. Due to the current short life, the project is not seen as highly sensitive to cost inputs.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders including traditional land owner claimants.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	None.
	Any identified material naturally occurring risks.	None.
	The status of material legal agreements and marketing arrangements.	None.
	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.	All permitting was in place but the clearing permit has expired. This will be re-applied for and expected to be granted closer to expected start of the pit.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves are reported as Probable classification which is made up of only Indicated Resource material. The Ore Reserve shapes have been generated using practical mining constraints.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	No Measured Mineral Resource contributes to Probable Ore Reserves.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserves reporting processes has been subjected to an internal review by Entech's senior technical personnel in July 2016.
Discussion of relative accuracy/ confidence	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.	The design, schedule and financial model on which the Ore Reserve is based has been completed to a "pre-feasibility study" standard, with a corresponding level of confidence.
	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	All modifying factors have been applied to design mining shapes on a global scale.

Criteria	JORC Code explanation	Commentary
	economic evaluation. Documentation should include assumptions made and the procedures used.	
	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.	The Ore Reserve is quoted to a "pre-feasibility' level. There is high confidence in the modifying factors and quoted Ore Reserve as physicals have been reported within minable shapes optimised to the SMU within the final pit design.
	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.	

JORC Code, 2012 Edition – Table 1 Report
EKJV (Hornet, Rubicon, Pegasus, Raleigh) Underground Deposits - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	A combination of sample types was used to collect material for analysis including both surface and underground diamond drilling (DD), reverse circulation (RC) surface drilling and face channel (FC) sampling.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	DD drilling is sampled within geological boundaries with a minimum sample length. Face channel sampling is constrained within geological and mineralised boundaries. RC drilling is primarily sampled on 1m intervals, 4m composite spear samples may be collected in areas where mineralisation is not expected.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	RC sampling was split using a rig mounted cone splitter to deliver a sample of approximately 3Kg. DD drill core was cut in half using an automated core saw the mass of material collected will depend on the hole size and sampling interval. A sample size of at least 3Kg of material was targeted for each face sample interval. All samples were delivered to a commercial laboratory where they were dried, crushed to 95% passing 3mm if required, at this point large samples may be split using a rotary splitter, pulverisation to 95% passing 75µm, a 30g charge was selected for fire assay.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Both RC and Diamond Drilling techniques were used at the K2 deposits (Hornet, Rubicon, Pegasus) and at Raleigh Diamond drill holes completed pre-2011 were predominantly NQ2 (50.5mm). All Resource definition holes completed post 2011 were drilled using HQ (63.5mm) diameter core. Core was orientated using the Reflex ACT Core orientation system. RC Drilling was completed using a 5.75" drill bit, downsized to 5.25" at depth. In many cases RC pre-collars were drilled followed by diamond tails. Pre-collar depth was to 180m or less if approaching known mineralisation.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC drilling contractors adjust their drilling approach to specific conditions to maximize sample recovery. Moisture content and sample recovery is recorded for each RC sample. No recovery issues were identified during RC drilling programs. Recovery was poor at the very beginning of each hole, as is normal for this type of drilling in overburden.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	For diamond drilling the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor.
	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.	Recovery was excellent for diamond core and no relationship between grade and recovery was observed. For RC drilling, pre-collars were ended before known zones of mineralization and recovery was very good through any anomalous zones, no issues were noted.
Logging	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.	All diamond core is logged for regolith, lithology, veining, alteration, mineralisation and structure. Structural measurements of specific features are also taken through oriented zones.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging is quantitative where possible and qualitative elsewhere. A photograph is taken of every core tray.
	The total length and percentage of the relevant intersections logged.	RC sample chips are logged in 1m intervals. For the entire length of each hole. Regolith, Lithology, alteration, veining and mineralisation are all recorded.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Diamond core is cut using an automated core saw. In most cases, half the core is taken for sampling with the remaining half being stored for later reference. Whole core sampling was only utilised in areas where the Geology is well understood and there is less requirement to retain core for future reference.

Criteria	JORC Code explanation	Commentary
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	All RC samples are split using a rig-mounted cone splitter to collect a sample 3-4kg in size from each 1m interval. These samples were utilised for any zones approaching known mineralization and from any areas identified as having anomalous gold. Outside known mineralized zones spear samples were taken over a 4m interval for composite sampling.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sampling types used are considered appropriate for the deposits.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Procedures are available to guide the selection of sample material in the field. Standard procedures are used for all process within the laboratory.
	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.	Field duplicates were taken for RC samples at a rate of 1 in 20. Umpire sampling programs are carried out on an ad-hoc basis.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	The sample sizes are considered appropriate for the material being sampled.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 30g Fire assay charge is used with a lead flux, dissolved in the furnace. The prill is totally digested by HCl and HNO3 acids before Atomic absorption spectroscopy (AAS) determination for gold analysis.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) are inserted into the sample sequence randomly at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations are re-assayed with a new CRM. blanks are inserted into the sample sequence at a rate of 1 per 20 samples. The insertion points are selected at random, except where high grade mineralisation is expected. In these cases, a blank is inserted after the high grade sample to test for contamination. Results greater than 0.2gpt is received are investigated, and re-assayed if appropriate. New pulps are prepared if anomalous results cannot be resolved. Field Duplicates are taken for all RC samples (1 in 20 sample). No Field duplicates are submitted for diamond core. Umpire sampling programs are undertaken on an ad-hoc basis.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections are verified by another Northern Star geologist during the drill hole validation process, and later by a Competent person to be signed off.
	The use of twinned holes.	No Twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging was captured using excel templates. Both a hardcopy and electronic copy of these are stored, as well as being loaded in to the database using automatic acquire loaders. Assay files are received in csv format and loaded directly into the database. A geologist then checks that the results have inserted correctly. Hardcopy and electronic copies of these are stored.
	Discuss any adjustment to assay data.	No adjustments are made to this assay data.
Location of data points	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.	Planned surface hole positions are located using a Differential GPS by Northern Star staff. Underground diamond hole positions are marked before drilling by mine survey staff and the actual hole collar position located by mine survey staff once drilling is completed. During drilling, single-shot surveys are every 30m to ensure the hole remains close to design. This is performed using the Reflex Ez-Trac system. Upon hole completion, a Gyroscopic survey is conducted by ABIMS, taking readings every 5m for improved accuracy. Direction measurements are collected relative to true north. For UG holes multi-shot surveys are taken every 9m when retreating out of the hole. The final collar position for each surface hole is picked up after hole completion by Differential.
	Specification of the grid system used.	Data is collected using both local mine grid (Kundana 10) and MGA 94 Zone 51 as appropriate.
	Quality and adequacy of topographic control.	Quality topographic control has been achieved through Lidar data and survey pickups of holes over the last 15 years.

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing across the area varies. For the Resource definition drilling, spacing was typically 40m x 40m, to allow the Resource to be upgraded to indicated. For the Pode drilling spacing was approximately 20m x 20m. The HRPD and Raleigh drilling was much wider spaced, as this is largely unclassified. Spacing is wider than 160m in some areas
	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.	The data spacing and distribution is considered sufficient to support the Resource and Reserve estimates.
	Whether sample compositing has been applied.	Sample data is composited before grade estimation is undertaken. Average intersection grades are reported in ASX and corporate announcements.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The majority of the structures in the Kundana camp dip steeply (80°) to WSW. The Pode structure has a much shallower dip in a similar direction, approximately 60°. To target these orientations the drill hole dips of 60-70° towards ~060° achieve high angle intersections on all structures. Drill holes with low intersection angles will be excluded from Resource estimation where more suitable data is available.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission samples are stored by Northern Star Resources in a secure yard. Once submitted to the laboratories they are stored in a secure fenced compound, and tracked through their chain of custody and via audit trails.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	No audits or reviews have recently been conducted on sampling techniques.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All holes mentioned in this report are located within the M16/309 and M16/326 Mining leases and are held by The East Kundana Joint Venture (EKJV). The EKJV is majority owned and managed by Northern Star Resources Limited (51%). The minority holding in the EKJV is held by Tribune Resources Ltd (36.75%) and Rand Mining Ltd (12.25%). The tenement on which the Rubicon, Hornet and Pegasus deposits are hosted (M16/309) is subject to three royalty agreements. The agreements that are on M16/309 are the Kundana- Hornet Central Royalty, the Lake Grace Royalty and the Kundana Pope John Agreement No. 2602-13. The southern portion of Raleigh is located on M15/993, which is held by the East Kundana joint venture entities. The northern extent of Raleigh is located on M16/157 which is 100% owned by Northern Star Resources. Ambition is located on M16/326.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The first reference to the mineralization style encountered at the Kundana project was the mines department report on the area produced by Dr. I. Martin (1987). He reviewed work completed in 1983 – 1984 by a company called Southern Resources, who identified two geochemical anomalies, creatively named Kundana #1 and Kundana #2. The Kundana #2 prospect was subdivided into a further two prospects, dubbed K2 and K2A. Between 1987 and 1997, limited work was completed. Between 1997 and 2006 Tern Resources (subsequently Rand Mining and Tribune Resources), and Gilt-edged mining focused on shallow open pit potential which was not considered viable for Pegasus, however the Rubicon open Pit was considered economic and production commenced in 2002. In 2011, Pegasus was highlighted by an operational review team and follow-up drilling was planned through 2012.

Criteria	JORC Code explanation	Commentary
		This report is concerned solely with 2014 drilling that led on from this period.
Geology	Deposit type, geological setting and style of mineralisation.	The Kundana camp is situated within the Norseman-Wiluna Greenstone Belt, in an area dominated by the Zuleika shear zone, which separates the Coolgardie domain from the Ora Banda domain. K2-style mineralisation (Pegasus, Rubicon, Hornet) consists of narrow vein deposits hosted by shear zones located along steeply-dipping overturned lithological contacts. The K2 structure is present along the contact between a black shale unit (Centenary shale) and intermediate volcaniclastics (Spargoville formation). Minor mineralization, termed K2B, also occurs further west, on the contact between the Victorious basalt and Bent Tree Basalt (both part of the regional upper Basalt Sequence). As well as additional mineralisation including the K2E and K2A veins, Polaris/Rubicon Breccia (Silicified and mineralised Shale) and several other HW lodes adjacent to the main K2 structure. A 60° W dipping fault, offsets this contact and exists as a zone of vein-filled brecciated material hosting the Pode-style mineralisation at Pegasus and the Nugget lode at Rubicon. Ambition is interpreted similar in style to the north of Pegasus
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many holes to practically list the complete dataset, the long section and plan reflect the hole positions used for previous estimation stated.
	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.	
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No exploration results are reported in this release.
	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.	No exploration results are reported in this release.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No exploration results are reported in this release.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No exploration results are reported in this release.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	No exploration results are reported in this release.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	
Diagrams	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.	Appropriate plans and section have been included in the body of this report.
Balanced reporting	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.	Both high and low grades have been reported accurately, clearly identified with the drill hole attributes and 'From' and 'To' depths.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density,	Metallurgical test work was conducted on 9 Pegasus samples. The results are summarized as follows: • All Pegasus recoveries were above 91% for the leach tests; • Gravity gold recovery estimated at 55%;

Criteria	JORC Code explanation	Commentary
	groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Cyanide consumption 0.62 kgpt; Lime 2.29 kgpt; • Oxygen Consumption 60 gpt per hour; • Bond Ball mill work index average 18.1 kWh/t; • Bond Abrasion Index average 0.1522.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Additional drilling is planned with the intention of extending known mineralisation along strike and at depth. Drilling will also be undertaken to improve confidence in previously identified mineralisation and to assist in the location of high grade shoots.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Basic plans and representative cross sections are provided with this report.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Sampling and logging data is either recorded on paper and manually entered into a database system, or is captured digitally via a logging laptop and directly loaded into the database system. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly into the database from laboratory and survey derived files.
	Data validation procedures used.	Random checks through use of the data and data validation procedure prior to Resource estimation.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The geological interpretations underpinning these Resource models were prepared by geologists working in the mine and in direct, daily contact with the ore body. The estimation of grades was undertaken by personnel familiar with the particular ore body and the general style of mineralisation encountered.
	If no site visits have been undertaken indicate why this is the case.	Multiple site visits undertaken by Geologists supervising the drilling programs and preparing the Geological interpretation.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource. The confidence in the geological interpretation is high and is supported with information acquired during ore development as well as from drilling.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drill holes, 3D photogrammetry and structural models.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed.
	The use of geology in guiding and controlling Mineral Resource estimation.	The interpretation of the main K2 and Raleigh structures is based on the presence of Quartz veining and continuity between sections on the K2 and Strzelecki (Raleigh) structures respectively. Drill core logging and face development mapping is used to create 3D constraining wireframes.
	The factors affecting continuity both of grade and geology.	Continuity is affected by the orientation of the host structures structure, and several dextral offset fault structures
Dimensions	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.	The strike length of the different ore systems varies from around 100m to 1000m. The individual ore bodies occur in a major regional shear system extending over 10s of kilometres. Ore body widths are typically in the range of 1 - 2m. Mineralisation is known to occur from the base of cover to around >1,000m below surface.
Estimation and modelling techniques	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	All grade values were estimated using Kriging, Ordinary Kriging was the preferred method in areas with good sample coverage, Simple Kriging was preferred in areas of poor sample coverage.

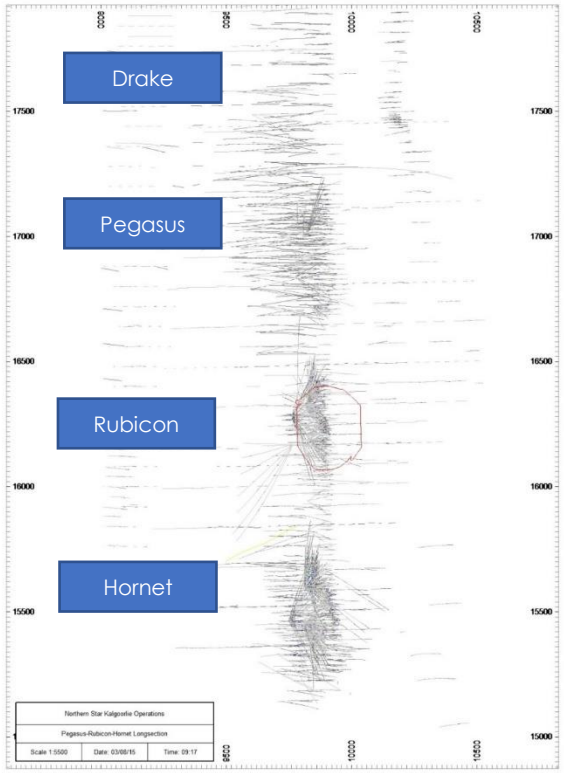
Criteria	JORC Code explanation	Commentary
	assisted estimation method was chosen include a description of computer software and parameters used.	Narrow vein style mineralisation, typically less than 5m width, was estimated using grade accumulation in 2D. The true thickness of each intersection was estimated using the local strike and dip of the interpreted ore body. Values were estimated into model cells for true thickness metre grams and true thickness. The final grade estimate was calculated by dividing the estimated accumulation value by the estimated thickness value. Thicker mineralised horizons used direct grade estimation supported by composited sample data. Typically, composite lengths of 1m were used. The composite files were checked to ensure that no sampling was lost or created during the compositing process. Sub-domaining was utilised when estimating values into zones where significant local differences in the mineralisation were observed. This included, but was not limited to, localised shoots where significantly higher grade mineralisation was observed relative to the surrounding material. Top cuts were developed for each domain and sub-domain based on a statistical analysis of the data. Note was taken of the number of composites impacted by the application of the top cut as well as the impact the top cut had on the mean and variance of the data set. The top cuts were applied to the data after the sample data had been composited. Variogram models were developed for each domain and sub-domain. Variogram models were developed in 2D or in 3D as appropriate for the estimation protocol adopted for each domain. Search distances used for estimation based on variogram ranges and vary by domain. The Kriging neighbourhood of each domain was refined using statistical measures of Kriging quality. The global mean values used during Simple Kriging were estimated from the declustered mean of the top-cut composited sample data. Drill spacing is generally around 20m x 20m for the indicated Resource and around 40m x 40m for the inferred Resource. The estimated grades were assessed against sample grades and against declustered mean values. Extensive use of computer software was made during the estimation process. The principal packages used included Datamine Studio RM, Surpac, Vulcan, Supervisor and Isatis.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Most deposits in the Kundana area have a history of prior production. Previously mined areas can be estimated and the results obtained compared with production records. Ongoing monitoring of the performance of the Resource models is undertaken through the production reporting system.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Cell sizes are selected for each deposit with reference to the available supporting data and the degree of geological confidence the company has in the deposit. For domains estimated in 2D panels ranging in size from 5m x 5m to 20m x 20m were used. The average thickness of the domain was used to set the panel thickness. Grades for 3D models were estimated into cells with sizes varying from 5m x 5m x 5m to 20m x 20m x 20m. Search ellipse dimensions were derived from the variogram model ranges and octant declustering was used to ensure that as much as possible the composites selected for use were evenly distributed around the cell to be estimated.
	Any assumptions behind modelling of selective mining units.	Selective mining units were not used during the estimation process. A minimum mining width was used when selecting material for inclusion in Resource tabulations.
	Any assumptions about correlation between variables.	All variables were estimated independently of each other.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralised domains are defined using a pair of wireframes surfaces representing the hanging wall and footwall of the domain. The surfaces are created from manually selected drill intersections. During core logging the occurrence of important structures is recorded in the geological database. When the interpretation is undertaken the start and end points of the flagged intervals are used to create the hanging wall and foot wall surface wireframes. In recognition that the material immediately adjacent to the main ore structures usually has grades elevated above the general background grade separate domains are generated to capture these values. In deposits where

Criteria	JORC Code explanation	Commentary
		appropriate sampling has been undertaken a 0.5m skin is used, in all other deposits a 1.0m skin is used. The wireframes to define the dilution skins are created by projecting the vein hanging wall surface to the West and the footwall surface to the east. For mine planning purposes a waste model is created by projecting the hanging wall and footwall surfaces 5m. Sub-domains are defined with reference to geological controls, declustered data sets and contour plots of grade, accumulation and thickness.
	Discussion of basis for using or not using grade cutting or capping.	Top-cuts were applied to the composited sample data with the intention of reducing the impact of outlier values on the average grade. Top cuts were selected based on a statistical analysis of the data with a general aim of not impacting the mean by more than 5% and vary by domain (ranging from 1 to 400gpt for individual domains and deposits).
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Statistical measures of Kriging error, such as Kriging Efficiency and Regression, are used to assess the quality of the estimation for each domain. Swath plots comparing composites to block model grades are prepared and plots are prepared summarising the critical model parameters. Visually, block grades are assessed against drill hole and face data.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	For Mineral Resources, the cut-off grade (COG) is generated using an A$1,750 gold price. Costs incorporated in the COG are built from first principals, based either on actual cost history or budgeted estimates. For Resources in active mine areas, a variable COG has been used for the Resource estimate. The Variable costing is defined as all directly incurred costs involved in the development and extraction of the ore panel (e.g., drill & blast, haulage, processing, refining and royalties on sales.). The variable COG does not include capital development or fixed costs (i.e., costs not directly associated with extraction, processing and selling gold) that would be absorbed by the existing Reserve base.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The interpretation of mineralisation is independent of mining considerations. After modelling, the software 'Mineable Shape Optimiser' is used to generate optimal mining shape based on a 2m minimum mining width, and variable costing Cut-off grade at the A$1,750 gold price. Any isolated MSO shapes unlikely to be economic are removed from the estimated Resource. The Resource reported is the Measured, Indicated & Inferred material within the MSO shape generated.
Metallurgical factors or assumptions	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.	Metallurgical test work results show that the mineralisation is amendable to processing through the Kanowna Belle treatment plant. Ore processing throughput and recovery parameters were estimated based on historic performance and potential improvements available using current technologies and practices.
Environmental factors or assumptions	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 green fields 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.	A "Licence to Operate" is held by the operation which is issued under the requirement of the "Environmental Protection Act 1986", administered by the Department of Environment (DoE). The licence stipulates environmental conditions for the control of air quality, solid waste management, water quality, and general conditions for operation. Groundwater licenses are held for water abstraction, including production bore field water use for mineral processing, and mine dewatering, in accordance with the Rights in Water and Irrigation Act 1914. These licenses are also regulated by DoE and are renewable on a regular basis. Kanowna Operations conduct extensive environmental monitoring and management programs to ensure compliance with the requirements of the licences and lease conditions. An Environmental Management System is in place to ensure that Northern Star employees and contractors exceed environmental compliance requirements. The Kalgoorlie operations are fully permitted including groundwater extraction and dewatering, removal of vegetation, mineral processing, and open pits. Kalgoorlie Operations have been compliant with the International Cyanide Management Code since 2008.

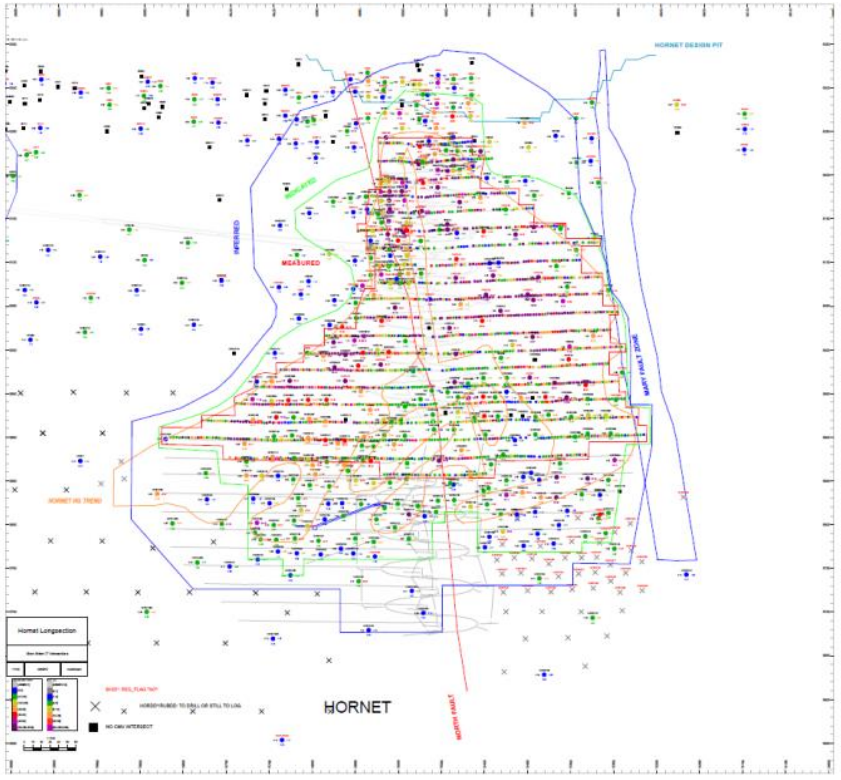
Criteria	JORC Code explanation	Commentary
		Compliance with air quality permits is particularly important at Kanowna because of the roaster operation and because there are three facilities in the Kalgoorlie region emitting SO_2 gas. Kanowna has a management program in place to minimize the impact of SO_2 on regional air quality, and ensure compliance with regulatory limits.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density was determined from surface diamond drill holes with intervals taken from mineralized and non-mineralised zones within the project area. The bulk densities are derived from wet and dry weighting of core no greater than 30cm total length, with core samples selected by changes in lithology/alteration or every 30-40m where no change is evident.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	No/minimal voids are encountered in the ore zones and underground environment.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk densities are applied to domains for the ore zone, footwall and hangingwall as constrained by the lode wireframes.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on a series of factors including: • Geologic grade continuity • Density of available drilling • Statistical evaluation of the quality of the kriging estimate
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	All relevant factors have been given due weighting during the classification process.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The Resource model methodology is appropriate and the estimated grades to reflect the Competent Persons view of the deposit.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	All Resource models have been subjected to internal peer reviews. The MY16 Pegasus model was audited by Cube Consulting with no material flaws identified.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	These Mineral Resource estimates are considered as robust and representative of the Kundana style of mineralisation. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource.
	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.	This Resource report relates to the entirety of the K2 ore zone (Hornet, Rubicon, Pegasus & Drake) and Raleigh deposit, including surrounding dilution skins and splays. Each of these will show local variability even though the global estimate reflects the total average tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No reconciliation factors are applied to the Resource post-modelling.

EKJV - REPRESENTATIVE PLANS AND CROSS SECTIONS

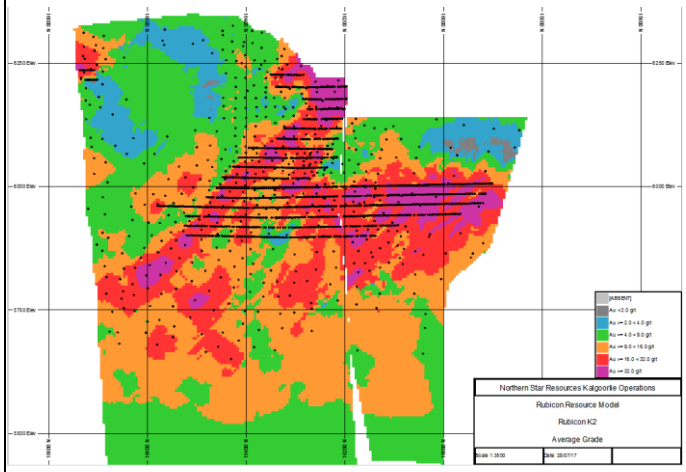
Plan view: Hornet – Rubicon – Pegasus - Drake Resource drill collars and Traces



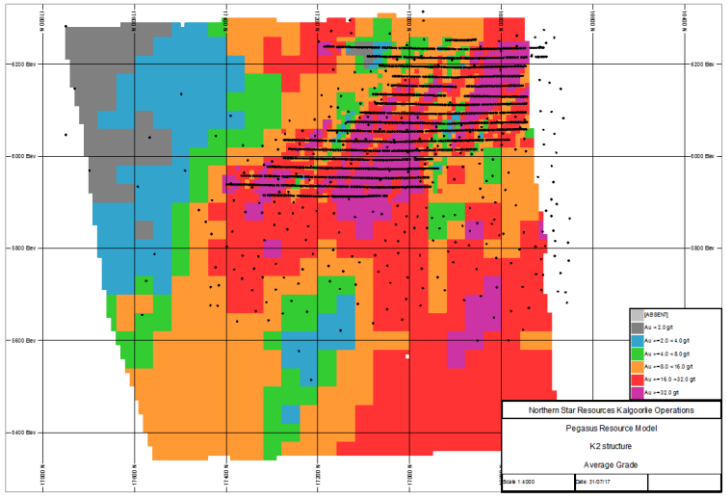
Long Section: Hornet Deposit with drillhole pierce points

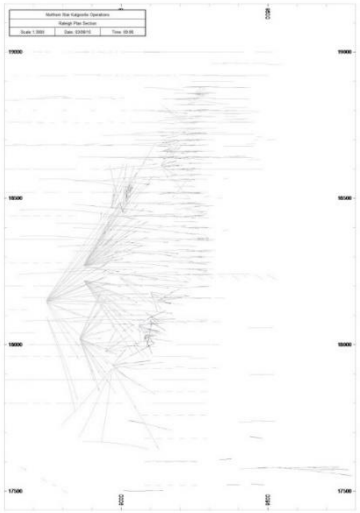


Long Section: Rubicon Resource model with drill hole pierce points

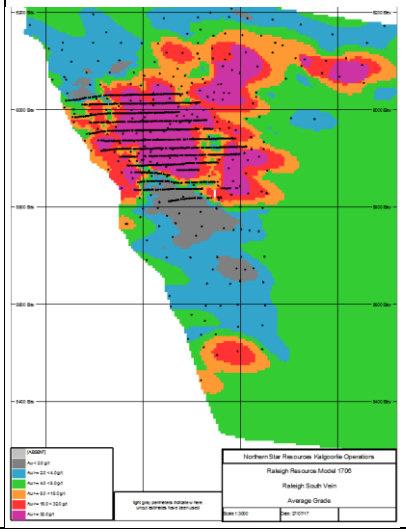


Long Section: Pegasus Resource model with drill hole pierce points





Plan View: Raleigh Deposit with drill hole traces



Long Section: Raleigh Resource model with drill hole pierce points.

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Northern Star 2017MY Resource.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Site visits have been undertaken by the competent person. The competent person is currently engaged to work on site.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	Feasibility Study.
	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.	Upgrade of previous Ore Reserve.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	For Rubicon Hornet and Pegasus, a break even cut off of 3.09 gpt applied based on actual historic costs. For Raleigh, a break even cut off of 4.94 gpt applied based on actual historic costs.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Mineral Resource is converted to Ore Reserve after completing a detailed mine design and associated financial assessment.
	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.	Selected mining method deemed appropriate as it has been used at Raleigh since 2005 & Rubicon / Hornet / Pegasus since 2011.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	Stope strike length generally 15m for dilution control purposes. Level spacings are typically 20m.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	This table one applies to underground mining only. The latest 2017 Resource models were used to generate the Reserves.
	The mining dilution factors used.	Based on historical mine performance, mining dilution of 1% Rock and 6% Paste dilution (7% total) for stoping additional to minimum mining width is applied as well as 10% dilution for Ore development.
	The mining recovery factors used.	Mining recovery factor of 94% is applied based on historical data.
	Any minimum mining widths used.	At Rubicon, Hornet, Pegasus and Raleigh: Minimum stope width of 3.0m where the vein is less than 2m wide. 1m additional to vein width when greater than 2m wide.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Designed stopes with greater than 50% inferred blocks are excluded from the reported Reserve.
	The infrastructure requirements of the selected mining methods.	Infrastructure in place, currently an operating mine.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	All Kundana ore is treated at the Kanowna Belle milling facilities. These facilities are designed to handle approximately 1.8 million tonnes of feed per annum. The plant has the capability to treat both refractory and free milling ores, through either using the flotation circuit and associated concentrate roaster circuit (including carbon-in-leach (CIL) gold recovery), or bypassing the flotation circuit and going directly to a CIL circuit designed to treat flotation tails. The plant campaigns both refractory and free milling ores every month. Between campaigns, the circuit is "cleaned out" using mineralised waste. The plant is made up of crushing, grinding, gravity gold recovery, flotation, roasting, CIL, elution and gold recovery circuits.
	Whether the metallurgical process is well-tested technology or novel in nature.	Plus 10 years milling experience with Kundana ores.

Criteria	JORC Code explanation	Commentary
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Plus 10 years milling experience with Kundana ores.
	Any assumptions or allowances made for deleterious elements.	No assumption made.
	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.	Plus 10 years milling experience with Kundana ores.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Not applicable.
Environmental	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.	Rubicon, Hornet, Pegasus and Raleigh are currently compliant with all legal and regulatory requirements. All government permits and licenses and statutory approvals are either granted or in the process of being granted.
Infrastructure	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.	All current site infrastructure is suitable to the proposed mining plan.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Mine development capital cost based on historical performance on site and life-of-mine forward planning. Plant and equipment capital also based on site experience and the LOM plan.
	The methodology used to estimate operating costs.	All overhead costs and operational costs are projected forward on a $/t based on historical data.
	Allowances made for the content of deleterious elements.	No allowances made.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Corporate guidance.
	The source of exchange rates used in the study.	Corporate guidance.
	Derivation of transportation charges.	Historic performance.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Historic performance.
	The allowances made for royalties payable, both Government and private.	All royalties are built into the cost model.
Revenue factors	The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.	AUD$ 1,500/oz. gold.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Corporate guidance.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	It is assumed all gold is sold directly to market at the Corporate gold price guidance of AUD$1,500/oz.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not Applicable.
	Price and volume forecasts and the basis for these forecasts.	Corporate guidance.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not Applicable.
Economic	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.	All costs assumptions are made based on historical performance from the mine and current economic forecast seen as representative of current market conditions.

Criteria	JORC Code explanation	Commentary
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities have been used with gold price ranges of A$1,300 to A$1,700 per ounce.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	No Issues.
	Any identified material naturally occurring risks.	No Issues.
	The status of material legal agreements and marketing arrangements.	No Issues.
	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.	No Issues.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	Ore Reserves classifications are derived from the underlying Resource model classifications – i.e. Measured Resource material is converted to either Proved or Probable Reserves, with Indicated Resource material converting to Probable Reserve.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results accurately reflect the competent persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	Nil.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	There have been no external reviews of this Ore Reserve estimate.
Discussion of relative accuracy/ confidence	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.	Confidence in the model and Ore Reserve Estimate is considered high based on current mine and reconciliation performance.
	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.	Estimates are global but will be reasonably accurate on a local scale.
	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.	Not applicable.
	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.	Historical reconciliation of Raleigh, Rubicon, Hornet and Pegasus mine production has been used in the generation both the underlying Resource estimate and subsequent modifying factors applied to develop a Reserve.

JORC Code, 2012 Edition – Table 1 Report
Paulsens Surface (Belvedere, Merlin) - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	This deposit is sampled by Diamond Drilling (DD) and Reverse Circulation (RC) drilling. Diamond core sample intervals are defined by the geologist to honour geological boundaries. RC initially sampled to 4m comps, any samples reporting > 0.1gpt were re-split and re-assayed as 1m composites.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Core is aligned and measured by tape, comparing back to down hole core blocks consistent with industry practice. RC drilling completed by previous operators, assumed to be to industry standard at the time (1998). Northern Star Resources(NSR) sampling methodologies are to current industry standard.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	DD completed to industry standard using varying sample lengths (0.3 to 1.2m) based on geological intervals, which are then crushed and pulverised to produce a ~200g pulp sub sample to use in the assay process. NSR and Intrepid Mines Ltd diamond core samples are fire assayed (50gm charge). Fine grained free gold is encountered occasionally. Pre NSR, Taipan Resources NL RC sampling assumed to be industry standard at that time. NSR RC sampling using mounted static cone splitter used for dry samples to yield a primary sample of approximately 4kg.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Surface RC drilling of 73 holes used ~5.25" face sampling bit. Surface DD core, 8 holes using NQ2. The surface core was orientated using the ORI-shot device.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC – Approximate recoveries are sometimes recorded as percentage ranges based on a visual weight estimate of the sample. DD – Recoveries are recorded as a percentage calculated from measured core versus drilled intervals. Overall recoveries are good.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	RC and diamond drilling by previous operators to industry standard at that time.
	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.	There has been no work completed on the relationship between recovery and grade.
Logging	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.	RC chips and surface DD core logged by company geologists to industry standard. All relevant items such as interval, lithologies, structure, texture. Grains size, alterations, oxidation mineralisation, quartz percentages and sulphide types and percentages are recorded in the geological logs. RC logging completed by previous operators to industry standard.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is qualitative, all core photographed and visual estimates are made of sulphide, quartz alteration percentages.
	The total length and percentage of the relevant intersections logged.	100% of the drill core and RC drilling chips were logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Core sample intervals are generally to 0.3-1.2m in length, honouring lithological boundaries to intervals less than 1m as deemed appropriate. NQ2 core is half core sampled cut with Almonté diamond core saw. The right half is sampled, to sample intervals defined by the Logging Geologist along geological boundaries. The left half of core is archived.

Criteria	JORC Code explanation	Commentary
		All samples are oven-dried overnight (105ºC), jaw crushed to <10mm. The total sample is pulverised in an LM5 to 90% passing 75µm and bagged. The analytical sample is further reduced to a 50gm charge weight using a spatula, and the pulp packet is stored awaiting collection by NSR.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	NSR RC initially sampled to 4m comps, any samples reporting > 0.1gpt were re-split and re-assayed as 1m composites. Rig mounted static cone splitter used for dry samples to yield a primary sample of approximately 4kg. Off-split retained. Duplicate samples are taken at an incidence of 1 in 25 samples. Pre- NSR assumed to be industry standard.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	There was no data available on Taipan sample preparation practices. It is assumed to be industry standard along with NSR processes which are Industry standard.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	NSR standard QAQC procedures and previous owners in the case of Taipan are assumed as Industry standard.
	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.	The field QAQC protocols include; duplicate samples at a rate of 1 in 25, coarse blanks inserted at a rate of 3%, commercial standards submitted at a rate of 4%. Industry standard QAQC procedures are assumed to have been employed by Taipan.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	DD - Core is half cut. Repeat analysis of pulp samples (for all sample types – diamond, RC, rock and soil) occurs at an incidence of 2 in 50 samples. Total gold is determined by fire assay using the lead collection technique (50 gm sample charge weight) and AAS finish. Various multi-element suites are analysed using a four-acid digest with an ICP-OES finish. Taipan Resources NL assay techniques were assumed to be industry standard.
	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.	Not applicable to this report.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	The laboratory QAQC protocols include a repeat of pulps at a rate of 3%, sizing at a rate of 1 per batch. The labs internal QAQC is loaded into NST database. In addition to the above, about 5% of samples are sent to an umpire laboratory. Failed standards trigger re-assaying a second 50g pulp sample of all samples in the fire above 0.1ppm. Both the accuracy component (CRM's and umpire checks) and the precision component (duplicates and repeats) are deemed acceptable. Although no formal heterogeneity study has been carried out or nomograph plotted, informal analysis suggests that the sampling protocol currently in use is appropriate to the mineralisation encountered and should provide representative results. Industry standard QAQC procedures are assumed to have been employed by pre NSR operators
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections are verified by NSR senior staff as required.
	The use of twinned holes.	There is no purpose drilled twin holes however holes BVRC018 and BVRC027 are 4m apart and reported 6m @ 2.6gpt and 5m @ 2.4gpt respectively.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	NSR data thoroughly vetted by database administrators. Data is stored in GBIS database has several inbuilt validations. Taipan holes of the 2006 database collated and extensively verified by Maxwell Geoservices previously.
	Discuss any adjustment to assay data.	No adjustments are made to any assay data.
Location of data points	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.	NST collar positions were surveyed using DGPS. Taipan Resources NL collars were surveyed at the end of a drill program. Old mine workings have been picked up on surface but actual extent and depth has been estimated using 1930's survey plan.

Criteria	JORC Code explanation	Commentary
		Topographic control uses Avista photo data supplemented with local DGPS pickups.
	Specification of the grid system used.	MGA 94_50.
	Quality and adequacy of topographic control.	Topographic control is based on the collar surveys and Avista photogrammetric survey.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Exploration results are based on the Drill traces as attached.
	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.	Data spacing is approximately 20m by 20m. Except one area where deviating holes have left a larger gap of 20m by 40m. Data spacing is adequate for the Resource estimation.
	Whether sample compositing has been applied.	Drill core is sampled to geology; sample compositing is not applied until the estimation stage. NSR RC samples initially taken as 4m composites to be replaced by 1 m samples if assays >0.1gpt were reported. Taipan RC samples treated similarly though historical details not fully reviewed.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	Intercept angles are predominantly moderate to high angle (70° to 90°) to the interpreted mineralisation resulting in unbiased sampling.
	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.	Unknown, assumed to not be material.
Sample security	The measures taken to ensure sample security.	Chain of custody is managed by NSR. Samples are stored on site and are delivered to assay laboratory in Perth by Contracted Transport Company. Consignment notes in place to track the samples. Whilst in storage they are kept in a locked yard. Pre NSR operator sample security assumed to be adequate.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	There have not been improved reviews of sampling techniques on NSR drilling phases.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	Mining Lease M08/222 is wholly owned by Northern Star Resources Limited and is in good standing. Heritage surveys have been conducted and the area was cleared for drilling. Relationship with the traditional owners is well informed and adequate.
	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.	Mining Lease M08/222 is valid currently to 2021. The access road L08/15 is valid until 2020.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Pre NSR data relevant to this Resource was collected by Taipan Resources NL (35 RC holes in 1998). All previous work is accepted as to industry standard at that time.
Geology	Deposit type, geological setting and style of mineralisation.	Mineralisation at this deposit is considered a mesothermal quartz reef (s) associated with quartz carbonate +/ pyrite, arsenopyrite chalcopyrite and galena, on the contact of by a north south trending dolerite dyke and surrounding sediments. A smaller domain is fault hosted and external to the dolerite host.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole	No exploration results being released this time.

Criteria	JORC Code explanation	Commentary
	o down hole length and interception depth o hole length.	
	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.	No exploration results being released this time.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	No exploration results being released this time.
	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.	Weighted by length when compositing for estimation.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	No exploration results being released this time.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Geometry of the mineralisation to drill hole intercepts is at a high angle, often nearing perpendicular.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	No exploration results being released this time.
Diagrams	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.	See plan view of drill traces for Belvedere and surrounding areas.
Balanced reporting	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.	No exploration results being released this time.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Old Belvedere mine, extents Other Exploration results not considered material. Geotechnical holes were drilled in 2015, results from these are used in pit optimisations.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Follow up drilling to infill and extend.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	See attached plan view.

Section 3 Estimation and Reporting of Mineral Resources

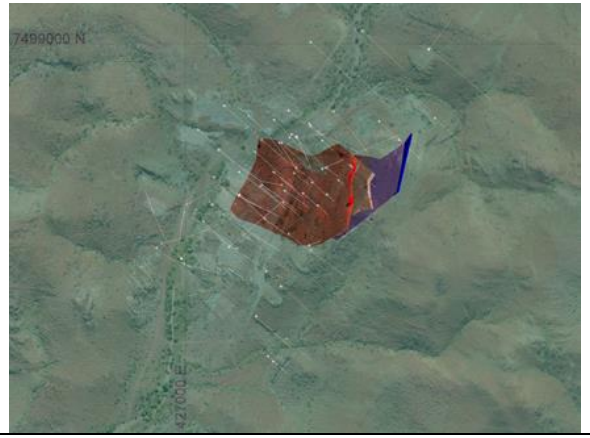
(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Sampling and logging data is entered directly into the logging package OCRIS. Constrained look-up lists, depth and some interval validation are inbuilt and ensure that the data collected is correct at source. Data is imported to a GBIS relational geological database where additional validation checks are carried out, including depth checks, interval validation, out of range data and coding. Where possible, raw data is loaded directly to the database. Pre-Northern Star Resources Limited(NSR) data assumed correct but no validation has been undertaken. For all data, the drilling looked reliable visually and no overlapping intervals were noted.
	Data validation procedures used.	NSR data validated by database administrators by checking 2% of raw data files. Taipan Resources NL data has not been validated apart from resurveying the old collar positions where found. No inconsistencies were found.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Site visits have been undertaken several times by the competent person.
	If no site visits have been undertaken indicate why this is the case.	Site visited.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology by the supervising and logging geologists. Sectional interpretations were digitized in Vulcan software and triangulated to form three dimensional solids. Confidence in the geological interpretation is moderate. Weathering zones and bedrock sub surfaces were also created.
	Nature of the data used and of any assumptions made.	All available valid data was used including drill data, mapping previous interpretations and existing 1930's mine development extents. Where pre-NSR drill data was used, it is assumed to be correct.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	There are currently no different interpretations.
	The use of geology in guiding and controlling Mineral Resource estimation.	Geology is used to constrain the quartz veins to the dolerite host.
	The factors affecting continuity both of grade and geology.	Grade continuity is related to quartz vein extent, within the constrained dolerite dyke host.
Dimensions	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.	Strike length = 150m; Width = 80m with zones 2 to 3m thick; Depth = from surface to ~160m below surface (top ~20m mined in the 1930's and wholly excluded from the Resource).
Estimation and modelling techniques	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.	ID2 was used to estimate this Resource using Vulcan 9.1 software. Domains are snapped to drilling, and composited to 1m downhole, Composites of less than 0.15m length are merged with the last composite. Four domains were used to reflect the 2 styles of mineralisation.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	A Resource was estimated internally in June 2015.
	The assumptions made regarding recovery of by-products.	No assumptions of by product recovery are made.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Block size is 2.5m x 2.5m x 2.5m. Sub-celled down to 1.25m x 1.25m x 1.25m to best fit estimation domains. Average drill hole spacing is variable ranging from <10m to 40m (average sample spacing~ 25m). Two search ellipse 70m x 25m x 9m (for Main, Hanging-wall and footwall zone) and 50m x 50m x 10m (belvedere fault zone) were used. Minimum of 4 samples to estimate, max 2 samples per octant.
	Any assumptions behind modelling of selective mining units.	No assumptions made.

Criteria	JORC Code explanation	Commentary
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill core logs, mapping and grade. Low grades can form part of an ore wire frame.
	Discussion of basis for using or not using grade cutting or capping.	Composites were cut to 20gpt (Main and hanging-wall) and 5gpt (Footwall and Belvedere Fault mineralisation) based on log distribution.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Block grades were compared visually to drilling data. Validation is also through swath plots comparing composites to block model grades, along 10m eastings, 10m nothings and 5m elevation's, comparing Inverse distance to nearest neighbour estimations. All compared favourable but there was no reconciliation against previous mining.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis. Moisture content within the ore is expected to be low (~1-2 %) as it is fresh rock with minimal voids reported.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Reporting cut off = 1.0gpt based on similar gold projects in the Ashburton Goldfields. Modeling lower grade cut off = 0.3gpt nominally, not more than 2m of internal dilution and requires minimum 2 holes.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	It is assumed Belvedere will initially be mined by open cut mining methods, and quick evaluations support the economics. Below the economic pit depth, grades are high enough to potentially be mined by underground methods.
Metallurgical factors or assumptions	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.	Extensive metallurgical testing including comminution, leaching and adsorption, flocculation, rheology and geochemistry test work was completed by ALS metallurgy in early 2015. Belvedere ore will be amenable to processing in the existing plant though the thickener may need to be optimised for best recovery.
Environmental factors or assumptions	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 green fields 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.	No environmental, permitting, legal, taxation, socio-economic, marketing or other relevant issues are known, that may affect the estimate.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk density used was based on 756 samples from 5 diamond holes. Measurements were taken using the immersion method and related back to dominant rock code.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	Bulk density of the host rock is well covered, but of the mineralisation only lower grade intersections are represented in only 7 samples. Ten samples were used to determine an average SG of weathered rock.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Individual bulk densities are applied to geological units.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on drill spacing to delineate inferred and indicated Resource. There is no Measured category.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Confidence in the relative tonnage and grade is high, NSR data input reliable, Taipan data assumed to be reliable (based on Paulsens experience). Distribution of data and continuity is moderate.

Criteria	JORC Code explanation	Commentary
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The result appropriately reflects the Competent Person(s)' view of the deposit.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This particular Resource has not been externally reviewed or audited.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This mineral Resource estimate is considered as robust and representative. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource on a global scale. It relies on historical data being of similar standard as recent infill drilling. This applies to approximately half of the holes. The relevant tonnages and grade are variable on a local scale.
	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.	This Resource report relates to the Belvedere area where it is likely to have local variability. The global assessment is more of a reflection of the average tonnes and grade estimate.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	There is no production data available.

PLAN VIEW OF THE BELVEDERE DEPOSIT



JORC Code, 2012 Edition – Table 1 Report
Paulsens Underground (Voyager, Titan, Upper Paulsens & Galileo) - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	This deposit is sampled by Reverse Circulation (RC), Diamond Drilling (DD) and face chip sampling. Sample intervals are defined by the geologist to honour geological boundaries. RC drill results are also used in the Upper Paulsens model.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Core is aligned and measured by tape, comparing back to down hole core blocks consistent with industry practice. RC and most surface core drilling completed by previous operators to industry standard at the time (late 1990's to 2011).
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Diamond drilling and face sampling are completed to industry standard using varying sample lengths (0.3 to 1.2m) based on geological intervals, which are then crushed and pulverised to produce a ~200g pulp sub sample to use in the assay process. Pre-June 2013, diamond core samples are fire assayed (30gm charge), current fire assay charge is 40gm. Face samples are assayed by Leachwell. Visible gold is occasionally encountered in core and face sampling. RC sampling to industry standard at the time. There is evidence of mineralisation widths being exaggerated in the lower zone particularly, these areas have now been mined out and do not affect current Resource.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Upper Paulsens model: Surface RC drilling, 332 holes (face sampling hammer, ~5 1/4" bit size), Surface drill core, 140 holes, (NQ2 sized, standard tube), 1,399 Underground DD, 4,983faces used to generate sample composite. Titan model: Surface diamond drill holes 2, 551 Underground drill holes, 592 faces/rises used to generate sample composite. Voyager model: 2689 Underground drill holes and 6122 faces/rises used to generate the sample composite. Galileo model: 463 Underground drill holes and 12 faces/rises used to generate the sample composite. Underground diamond holes are LTK60 or NQ2 size. Surface core is orientated using the EZ ORI-shot device, underground drill core is rarely oriented. Faces are chip sampled aiming to sample every ore development cut but ~10% of ore cuts were missed pre-2015, now all faces are mapped and sampled.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Diamond drill recoveries are recorded as a percentage calculated from measured core versus drilled intervals. Achieving >95% recovery. Greater than 0.2 metre discrepancies are resolved with the drill supervisor. Surface RC drill recoveries are unknown.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Standard diamond drilling practice results in high recovery due to competent nature of the ground. RC drilling by previous operators to industry standard at the time.
	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.	There is no known relationship between sample recovery and grade, sample recovery is very high.
Logging	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.	Core logging is carried out by company geologists, who delineate intervals on geological, structural, alteration and/or mineralogical boundaries, to industry standard. Surface core and RC logging was completed by previous operators to industry standard.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is qualitative and all core is photographed. All sampled development faces are photographed. Visual estimates are made of sulphide, quartz and alteration percentages.
	The total length and percentage of the relevant intersections logged.	100% of the drill core is logged. 100% of RC drilling is logged.

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	LTK 60 is generally whole core sampled, NQ2 core is generally half core sampled. If not whole core sampled, then core is half cut with an Almonté diamond core saw and half core sampled. The right half is sampled, to sample intervals defined by the logging geologist along geological boundaries. The left half is archived. All major mineralised zones are sampled, plus associated visibly barren material, >5m of the hangingwall and footwall. Quartz veins >0.3m encountered outside the know ore zone and ±1m on either side are also sampled. Ideally, sample intervals are to be 1m in length, though range from 0.30m to 1.20m in length. Total weight of each sample generally does not exceed 5kg. All samples are oven-dried overnight (max 1200), jaw crushed to <6mm, and split to <3kg in a static riffle splitter. The coarse reject is then discarded. The remainder is pulverised in an LM5 to >85% passing 75µm (Tyler 200 mesh) and bagged. The analytical sample is further reduced to a 30gm charge weight using a spatula, and the pulp packet is stored awaiting collection by Northern Star Resources Limited(NSR). Post 2013, samples are crushed to 90% passing 3mm before a rotary split to 2.5 kg, all of which is then pulverised to 90% passing 75 microns. For older core, pre- NSR, best practice is assumed.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Development face samples are chipped directly off the face into a sample bag, aiming for >2.5kg. Sample intervals range between 0.3 – 1.2m in length, modified to honour geological boundaries, and taken perpendicular to the mineralisation if practical. Site lab sample preparation since January 2013 uses a Boyd to crush and split to 3mm. Before that a jaw crusher (6mm aperture) and 50/50 rifle splitter were used.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Sample preparation is deemed adequate.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	For drill core the external labs coarse duplicates are used. One face sub sample per day is sent offsite for fire assay analysis to compare to Leachwell assay results. RC drilling by previous operators to industry standard at that time.
	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.	Field duplicates, i.e. other half of cut core, are not been routinely assayed. For each development face, one field duplicate is taken of the highest grade area, to assess the reproducibility of the assays, and the variability of the samples. Variability is very high due sampling technique and to nuggetty nature of the mineralisation. The variability is accepted, countered by the high density of sampling.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	For all drill core samples, gold concentration is determined by fire assay using the lead collection technique with a 30 gram sample charge weight. An AAS finish is used, considered to be total gold. A 40 gram fire assay charge is used post June 2013. Various multi-element suites are analysed using a four-acid digest with an ICP-OES finish. Face samples are analysed using Leachwell process, and are not considered total gold. RC drill samples by previous operators assumed fire assay with AAS finished.
	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.	No other sources of data reported.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	The QAQC protocols used include the following for all drill samples: Site sourced coarse blanks are inserted at an incidence of 1 in 40 samples. From April 2013, commercial blanks are used. Commercially prepared certified reference materials are inserted at an incidence of 1 in 40 samples. The CRM used is not identifiable to the laboratory. NSR's blanks and standards data is assessed on import to the database and reported monthly, quarterly and yearly. The primary laboratory QAQC protocols used include the following for all drill samples:

Criteria	JORC Code explanation	Commentary
		Repeat of pulps at a rate of 5%. Screen tests (percentage of pulverised sample passing a 75µm mesh) are undertaken on 1 in 100 samples. The laboratory and Geology department report QAQC data monthly. Failed standards are followed up by re-assaying a second 30g pulp sample of the failed standard ± 10 samples either side by the same method at the primary laboratory. One standard is inserted with every face sampling submission to assess site lab performance. Both the accuracy component (CRM's and umpire checks) and the precision component (duplicates and repeats) are deemed acceptable. QAQC protocols for surface RC and diamond drilling by previous operators is unknown, assumed to be industry standard.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections are reviewed by the geology manager and senior corporate personnel.
	The use of twinned holes.	Twinned holes are not specifically designed. Occasionally deviating holes could be considered twins, showing similar tenor of mineralisation.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Until June 2014, data was hard keyed or copied into excel spreadsheets for transfer and storage in an access database. Data is now entered in the OCRIS data capture system, where it is then exported to the GBIS Geology database after validating. Hard copies of face and core / assays and surveys are kept on site. All face sheets are scanned and saved electronically as well. Internal checks are made comparing database to raw assays files. Visual checks are part of daily use of the data in Vulcan. Data from previous operators taken from 2006 database compilation by Maxwell Geoservices and further maintained by a succession of Paulsens owners. All data now stored in GBIS and electronically logged and downloaded.
	Discuss any adjustment to assay data.	No adjustments are made to any assay data. First gold assay is utilised for any Resource estimation.
Location of data points	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.	Drill hole collar positions are picked up by survey using a calibrated total station Leica 1203+ instrument. Drill hole, downhole surveys are recorded at 15m and 30m, and then every 30m after, by calibrated Pathfinder downhole cameras. Face samples are located by laser distance measurement device and digitised into Vulcan software. The faces are represented as "pseudo-drill holes" to allow assignation of survey, lithology, assay, and other relevant information. Underground workings are tied into defined surface survey stations. Surface hole collars picked up by the mine surveyors in mine grid. Pre - NSR survey accuracy and quality assumed to be industry standard.
	Specification of the grid system used.	A local grid system (Paulsen Mine Grid) is used. It is rotated 40.61 degrees to the west of MGA94 grid. Local origin is 50,000N and 10,000E Conversion. MGA E = (East_LOC*0.75107808+North_LOC*0.659680194+381504.5)+137.5 MGA N = (East_LOC*-0.65968062+North_LOC*0.751079811+7471806)+153.7 MGA RL = mRL_LOC-1000
	Quality and adequacy of topographic control.	Topographic control is not that relevant to the underground mine. For general use, recent Arvista aerial surveys are flown annually. Resolution is +/- 0.5m.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Exploration result data spacing can be highly variable, up to 100m and down to 10m.
	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.	Measured data spacing is better than 7m x 7m, and restricted to areas in immediate proximity to mined development. Data spacing for indicated material is approximately, or better than, 20m x 20m. All other areas where sample data is greater than 20m x 20m, or where intercept angle is low, is classified as inferred.

Criteria	JORC Code explanation	Commentary
	Whether sample compositing has been applied.	Core and faces are sampled to geology, sample compositing is not applied until the estimation stage. RC samples initially taken as 4m composites to be replaced by 1 m samples in ores zones above assumed threshold.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	Intercept angles are mixed; however, all material remains inferred until reconciled by moderate to high angle (45° to 90°) grade control drilling, or mining activities. Hanging-wall drill drives provide excellent intercept orientation to the geological structures used in the estimate.
	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.	The drill orientation to mineralised structures biases the number of samples per drill hole. It is not thought to make a material difference in the Resource estimation. As the opportunity arises, better angled holes are drilled with higher intersection angles.
Sample security	The measures taken to ensure sample security.	All samples are selected, cut and bagged in tied numbered calico bags, grouped in larger tied plastic bags, and placed in large sample cages with a sample submission sheet. The cages are transported via freight truck to Perth, with consignment note and receipts. Sample pulp splits are returned to NSR via return freight and stored in shelved containers on site. Pre NSR operator sample security assumed to be similar and adequate.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	Recent external review confirmed core and face sampling techniques are to industry standard. Data handling is considered adequate and was further improved recently with a new database. Pre NSR data audits found less QAQC reports, though in line with industry standards at that time.

Section 2 Reporting of Exploration Results

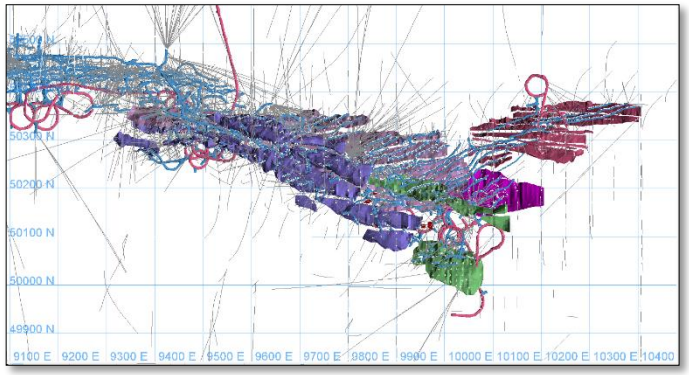
(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	M08/196 and M08/99 are wholly owned by Northern Star Resources (NSR) and in good standing. Surface expression of the Paulsens Gold Mine is on M08/99, most of underground workings are on neighbouring M08/196. There are no heritage issues with the current operation. Relationship with the traditional owners is good. There is an on-going Production royalty payment to the traditional owners the terms of which are confidential.
	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.	M08/196 and M08/99 are valid for 21 years and are renewable.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Data relevant to these Resources was collected by CRA, Hallmark, Taipan, St Barbara, Nustar and Intrepid Mines Ltd before NSR. All previous work is accepted as to be at industry standard at the time.
Geology	Deposit type, geological setting and style of mineralisation.	Paulsens is a high grade, quartz hosted, mesothermal gold deposit within metasediments.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many (>6000) holes to practically summarise all information for all drill holes and faces used in the Resources. Detailed drill hole data is periodically released on ASX with all relevant information attached and can be found on the Northern Star website.
	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.	Exclusion of information does not detract from this report. For reference, recent releases were dated as follows: 29/2/2016, 4/8/2015, 13/01/2015, 19/02/2014, 05/09/2013, 23/09/2013, 02/08/2013, 29/05/2013, 16/05/2013, 20/01/2013, 12/12/2012, 1/10/2012, 24/8/2012, 04/07/2012, 07/06/12, 29/05/2012, 12/04/2012, 6/03/2012, 25/11/2011, 17/11/2011, 09/11/2011, 13/10/2011, 12/09/11, 30/05/2011, 12/04/2011, 16/03/2011, 06/01/2011, 04/01/2011, 22/12/2010, 10/12/2010, 02/12/2010, 14/10/2010, 04/08/2010.

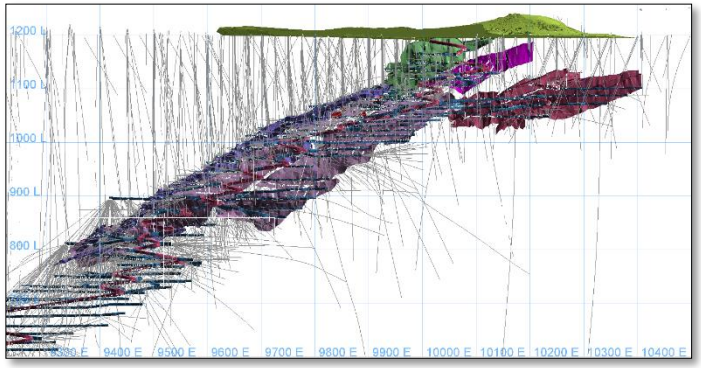
Criteria	JORC Code explanation	Commentary
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Reported exploration results are uncut.
	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.	Short intervals are length weighted to create the final intersections.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Due to complex mineralisation geometry and varying intercept angles the true thickness is manually estimated on a hole by hole basis.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Downhole length in addition to estimated true width is shown in the report tables.
Diagrams	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.	Relevant diagrams are contained with this report
Balanced reporting	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.	The results released are considered representative of the results received to date.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	No other relevant data to report.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Drilling will continue down plunge, to the north, and as needed for grade control in line with the mine plan.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Part of this ASX announcement.

PAULSENS UNDERGROUND - REPRESENTATIVE PLAN & LONG SECTION

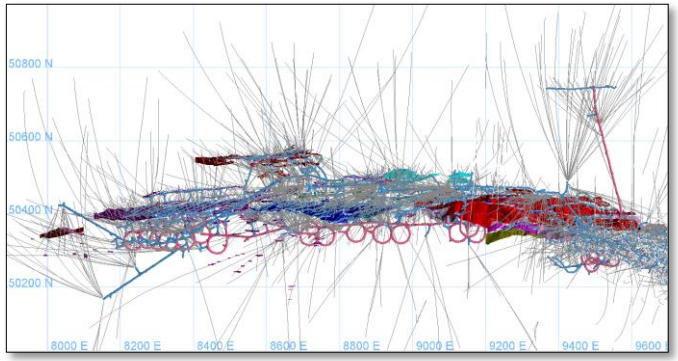
Plan View – Paulsens upper Levels



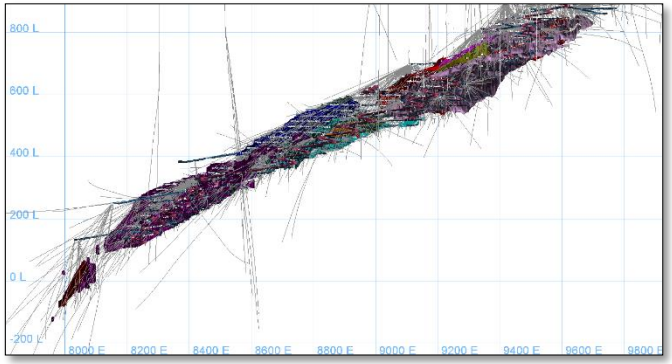
Long Section View – Paulsens upper levels looking north.



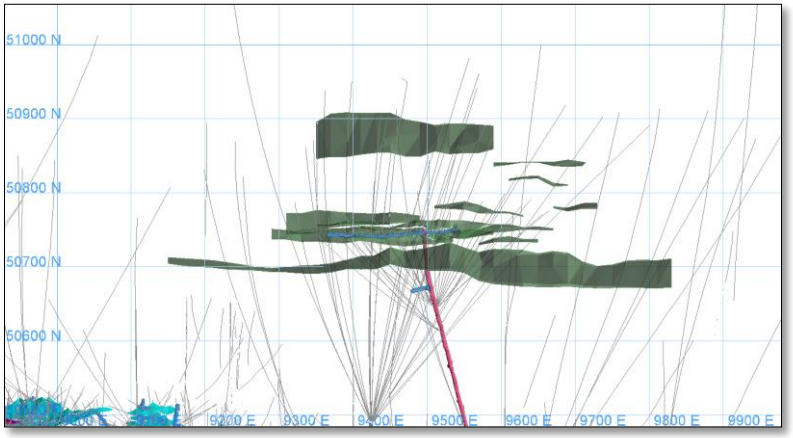
Plan View – Paulsens Voyager & Titan deposits



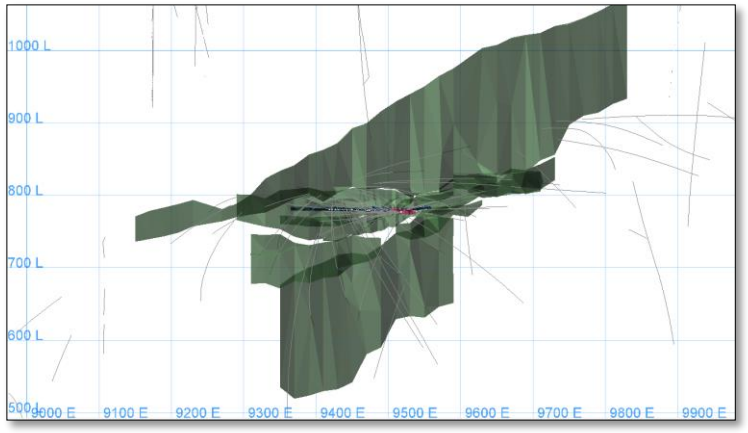
Long Section View – Paulsens Voyager & Titan deposits looking north



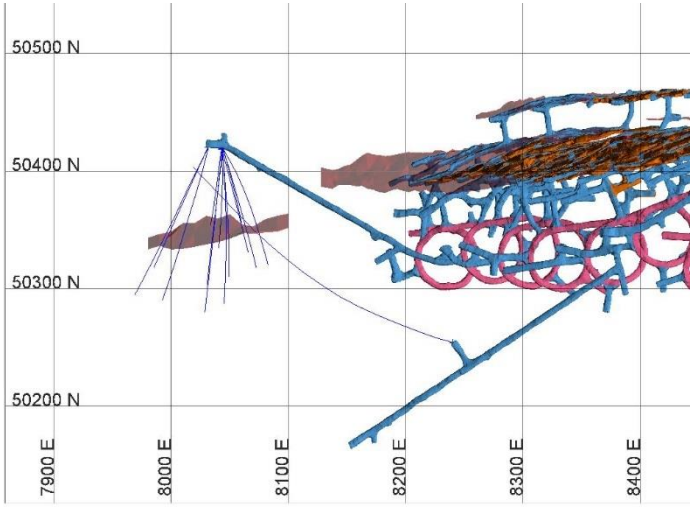
Plan View – Paulsens Galileo deposit



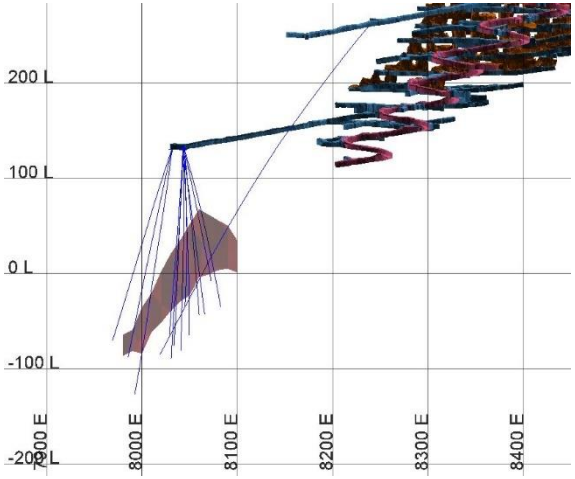
Long Section View – Paulsens Galileo deposit looking north



PAULSENS UNDERGROUND – EXPLORATION DRILLHOLES IN THIS RELEASE



Plan view of reported exploration results



Section view of reported exploration results

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Sampling and logging data is entered into the OCRIS logging data capture system then transferred to GBIS database. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly to the database from the laboratory. Pre-Northern Star Resources (NSR) data assumed correct, maintained by database administrators.
	Data validation procedures used.	Random checks through use of the data as well as database validations. Checks as part of reporting significant intersections and end of program completion reports are also completed. In addition to this, 5% of the underground drill holes, faces and sludge samples have been validated against the raw data collected. Maxwell Geo Services extensively validated the 2006 data compilation.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	This Resource estimate has been conducted by geologists working in the mine and in direct, daily contact with the ore body data used in this Resource estimate. The competent person, has worked at the deposit for 3 years, and is the current Geology Manager.
	If no site visits have been undertaken indicate why this is the case.	See above.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource. The confidence in the geological interpretation is high with all the information and plus 13 years of operation.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drilling faces, photos, structures.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No substantially different, alternative interpretations have been completed or put forward.
	The use of geology in guiding and controlling Mineral Resource estimation.	The majority of mineralisation is located within a large, variably folded and faulted quartz host, close to, or on, the contacts with the surrounding wall rock sediments between an offset Gabbro intrusive. Drill core logging and face development is used to create 3D constrained wireframes.
	The factors affecting continuity both of grade and geology.	Grade continuity is related to the quartz and sulphide events within the boundaries of the gabbro extent. Mineralised veins are also within the gabbro.
Dimensions	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.	Upper Paulsens: • Strike length = 1,100m down plunge at 30-35deg to the west; • Width = ~80m (though high grade component ~ 5m wide); • Depth = from ~130m below surface to ~550m below surface; Voyager: • Strike length = 1,850m down plunge, 25-30 deg to grid west; Width = ~190m; • Depth = from ~550m below surface to ~1,100m below surface; Titan: • Strike length = 350m down plunge, 25 degrees to grid west; • Width = 50m; • Depth = from 750 to 925m below surface; Galileo: • Strike length = 360m down plunge,10 degrees to grid west; • Width = 50m; • Depth = from 380 to 520m below surface;
Estimation and modelling techniques	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.	Inverse distance squared (ID2) was used to estimate this Resource, using Vulcan 8. Mineralisation domains (in four models) were used to constrain the various lodes, defined by orientation, geological continuity, and grade population. Each domain is validated against the lithology, and then snapped to the drill-hole and face data to constrain the mineralised envelope as a 3D wireframe. Compositing of drill-hole samples was completed against these wireframed domains at 1m (downhole) interval.

Criteria	JORC Code explanation	Commentary
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Recent reconciliations of the area have been in line with Resource expectations.
	The assumptions made regarding recovery of by-products.	No assumptions are made, but silver is a by-product that makes up part of the refinery revenue. This is not in the model and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Block size is 5m x 4m x 5m, sub-blocked to 1m x 0.25m x 1m to suit the narrow east-west orientation of the majority of the domains. Average sample spacing is 3.5m in the case of face samples. Search ellipsoids are 25 * 12 * 6m to 50 * 20 * 10 m, varying the minimum number of samples required on successive passes as well as utilizing an octant search to decluster.
	Any assumptions behind modelling of selective mining units.	No assumptions made.
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill core logs, mapping and grade. Low grades can form part of an ore wireframe.
	Discussion of basis for using or not using grade cutting or capping.	Top-cuts were used based on statistical analysis undertaken in Supervisor that ranges from 10 to 200gpt on individual domains. Top cuts are set to incorporate approximately 97.5% of the available sample population for each domain.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Validation is through swath plots comparing composites to block model grades, along 20m eastings and RL, comparing the block model means vs composite means for each domain. Visually, block grades are assessed against drill hole data.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis. Moisture content within the ore is low (~1-2 %).
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Resource reporting based on MSO (Mining Stope Optimiser) using blocks 10m high by 10m wide (variable widths) and a grade of 2.25gpt. Individual MSO Blocks are then visually assessed for "mineability". Remnant stope "skins", small remote blocks and inaccessible pillars are removed.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	Standard sub level retreat mining methods are predominantly used. Historical mining and reconciliation data has been taken into consideration but without affecting wire frame interpretation. The total model has been coded to identify previously mined areas and only reports remnant mineralisation.
Metallurgical factors or assumptions	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.	The ore is free milling (Life of Mine over 13 years 91.5% recovery), average hardness (BWI15-16), and with no significant refractory component. There are few deleterious elements, the footwall graphitic shales being a concern in that this can affect recovery through preg-robbing if processed on its own. High percentages of pyrrhotite and chalcopyrite have been known to affect recovery. This known effect is managed through blending the ROM feed to the crusher prior to milling.
Environmental factors or assumptions	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 green fields project, may not always be well advanced, the	Paulsens is an operating mine with 13 years' history and all permits and closure plans in place. As with all unweathered, underground deposits, when mined, natural oxidation and weathering occurs, however, the ore and waste material mined at Paulsens has been reviewed several times by both independent and contracted consultants with the overall comment that there appears to be no major effects on the environment outside of the environmental conditions imposed with the granting of the initial mining license.

Criteria	JORC Code explanation	Commentary
	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.	
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Over 4,000 bulk density measurements from diamond drill holes have been taken from 199 mineralized and un-mineralised intervals within the project area. The bulk densities are derived from laboratory pycnometer readings, with some of the domain densities adjusted over time through mine tonnage reconciliations. Immersion method SG calculations are now routinely preformed to validate against the block model bulk density estimates.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	Minimal voids are encountered in the ore zones and underground environment.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Individual bulk densities are applied to geological units and ore zones.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is defined by data spacing of diamond holes, face/wall and rise sampling and reflects the degree of confidence in the areas specified. Measured Resource classification is where the estimate is supported by data less than 5m apart and/or within 5-7m of development. Indicated Resource classification is where the mineralisation has been sufficiently defined by a drill spacing of 12-15m x 12-15m or better, and/or where development has occurred within 12-15m. Inferred Resource is based in addition to the above to a maximum search distance of 50 m from last sample point and high angle drill intercepts. The Upper Paulsens Resource has not been audited externally. Previous estimates of this area utilising the same, or very similar variables, have been reviewed by external parties and internal parties with protocols deemed appropriate. The area has also been externally estimated by Ordinary Kriging (Hellman and Schofield 2007-2010), Inverse distance (ResEval Pty Ltd) 2004-2006, Conditional Simulation and Ordinary Kriging (Golders) 2002.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Classification is primarily based on 13 years of Paulsens mining experience.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This mineral Resource estimate is considered representative.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This particular Resource has not been audited externally. Previous estimates of this area utilising the same, or very similar variables, have been reviewed by external parties and internal parties with protocols deemed appropriate.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This Resource is one in an iterative, evolutionary approach, attempting to increase confidence with each estimation. Taking account of all reconciliation, audits, mentor, and increased ore body knowledge the qualitative confidence improves with mining and drilling.
	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.	This Resource report relates to the Upper Paulsens, Voyager, Titan and Galileo areas, and will show local variability. The global assessment is more of a reflection of the average tonnes and grade estimate.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	The current inverse distance estimation methodology appears to perform sufficiently as an estimation technique for the Paulsens mineralisation.

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	NST MY 2017 Resource.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person has conducted numerous site visits, as well as consulted on a range of operating elements.
	If no site visits have been undertaken indicate why this is the case.	Site visits undertaken.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	Update of previous Ore Reserve.
	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.	Update of previous Ore Reserve.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Break even cut off of 3.83 gpt applied.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Indicated Resources were converted to Probable Ore Reserves subject to mine design physicals and an economic evaluation. Measured material existed in the Voyager Resource model which subsequently converted to Proved Reserves. Further to this stockpiles and gold in circuit (GIC) and gold in transit (GIT) were considered as Proved.
	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.	Selected mining method deemed appropriate as it has been used at Paulsens since 2005.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	Assumptions based on actual mining conditions.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	This table one applies to underground miring only.
	The mining dilution factors used.	Based on historical mine performance, mining dilution of 20% for stoping and 17% for development is applied based on historical data.
	The mining recovery factors used.	Mining recovery factor of 90%, mining dilution of 20% for stoping and 17% for development is applied based on historical data.
	Any minimum mining widths used.	2.0m.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Designed stopes with greater than 50% inferred blocks are excluded from the reported Reserve.
	The infrastructure requirements of the selected mining methods.	Infrastructure in place, currently is an operating mine.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	The Paulsens gold mill utilises a CIL (Carbon In Leach) circuit for the extraction of gold. Reserves are based on historical data from the operation of the plant and a Processing recovery of 88% is used for Paulsens based on historical results.
	Whether the metallurgical process is well-tested technology or novel in nature.	Milling experience gained since 2005, 12 years' continuous operation.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Milling experience gained since 2005, 12 years' continuous operation.
	Any assumptions or allowances made for deleterious elements.	No assumption made.

Criteria	JORC Code explanation	Commentary
	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.	Milling experience gained since 2005, 12 years' continuous operation.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Gold only being reported.
Environmental	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.	Paulsens is currently compliant with all legal and regulatory requirements. All government permits and licenses and statutory approvals are either granted or in the process of being granted.
Infrastructure	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.	All current site infrastructure is suitable to the proposed mining plan.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Actual mine operating costs used.
	The methodology used to estimate operating costs.	Processing, Mining Services, Geology Services and Administration costs have been estimated as a cost per ore tonne based on tracked historical performance. Mining Services fixed cost is based on the monthly lump sum provided in the schedule of rates and then annualised and divided by the budgeted annual processing rate to obtain a cost per ore tonne.
	Allowances made for the content of deleterious elements.	No allowances made for deleterious elements.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Single commodity pricing for gold only, using a long-term gold price of AUD$1,500 per ounce 2.5% WA State Government royalty.
	The source of exchange rates used in the study.	All in $AUD.
	Derivation of transportation charges.	Historic performance.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Refining charge built into the cost model.
	The allowances made for royalties payable, both Government and private.	All royalties are built into the cost model.
Revenue factors	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.	Revenue was based on a gold price of AUD $1,500 per ounce.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	NSR internal Resource and Reserve guidelines 2017. These are documented in emails and memos.
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	It is assumed that all gold is sold direct to the market.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Not relevant to gold.
	Price and volume forecasts and the basis for these forecasts.	Not relevant to gold.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	Not relevant to gold.
Economic	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.	All costs assumptions are made based on historical performance from the mine and current economic forecast seen as representative of current market conditions.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	Sensitivities not assessed.

Criteria	JORC Code explanation	Commentary
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders including traditional land owner claimants.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	
	Any identified material naturally occurring risks.	No issues foreseen.
	The status of material legal agreements and marketing arrangements.	No issues foreseen.
	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.	As a current operation, all government approvals are in place. No impediments are seen in any of these agreements for the continuation of mining activities.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves include Proved (if any) and Probable classifications.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results accurately reflect the competent persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	None.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	There have been no external reviews of this Ore Reserve estimate. Internally reviewed by site and corporate staff.
Discussion of relative accuracy/ confidence	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.	Confidence in the model and Ore Reserve Estimate is considered high based on current mine and reconciliation performance.
	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.	Estimates are global but will be reasonable accurate on a local scale.
	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.	Other than dilution and recovery factors, no additional factors have been applied to the 2017 MY estimation.
	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.	Reconciliation results from past mining at Paulsens has been considered and factored into the Reserve assumptions where appropriate.

JORC Code 2012 Edition – Table 1 Report
Ashburton Mt Olympus Deposit (including Waugh, Zeus, Electric Dingo & Romulus) - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	This deposit is sampled by diamond drilling and RC drilling completed by NSR (Northern Star Resources Limited) and previous operators. NSR – DD. Sampled sections are generally NQ2. Core sample intervals are defined by the geologist to honour geological boundaries ranging from 0.3 to 1.5m in length. NSR - RC - Rig-mounted static cone splitter used with the aperture set to yield a primary sample of approximately 4kg for every metre (representing approximately one eighth of the total sample). Off-split retained. RC and DD sampling by previous operators to industry standard at that time often using 1m samples after initial 4m composites. It is unknown what grade threshold triggers the 1m re-samples.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Core is aligned and measured by tape, comparing back to down hole core blocks consistent with industry practice. RC and surface core drilling completed by previous operators to industry standard at that time (1988 initial discovery, to 2004).
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Diamond drilling completed to industry standard using varying sample lengths (0.3 to 1.5m) based on geological intervals, which are then crushed and pulverised to produce a ~200g pulp sub sample to use in the assay process. NSR diamond core samples are fire assayed (50g charge). Visible gold is occasionally encountered in core. RC sampling to industry standard at the time of drilling.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	RC – Reverse circulation drilling is carried out using a face sampling hammer and a 5¼ inch diameter bit. NSR surface diamond drilling carried out by using both HQ3 (triple tube) and NQ2 (standard tube) techniques. Sampled sections are generally NQ2. Core is orientated using the ORI-shot device.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC – Approximate recoveries are sometimes recorded as percentage ranges based on a visual and weight estimate of the sample. *DD – Recoveries are recorded as a percentage calculated from measured core verses drilled intervals.*
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	NSR diamond drilling practice results in high recovery due to the competent nature of the ground. For RC drilling, efforts are made to ensure good recoveries are achieved by the use of auxiliary compressors and high pressure booster units supplying compressed air at a high enough pressure to keep water from the hole and the samples dry in most circumstances. Where water is encountered in the pre-collar and wet samples result, more frequent cleaning of the cyclone and splitter is carried out and the hole is thoroughly flushed at the end of each sample. RC and diamond drilling by previous operators to industry standard at that time.
	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.	There is no known relationship between sample recovery and grade, diamond drill sample recovery is very high.
Logging	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.	Core and chip samples have been logged by qualified Geologist to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. Percussion holes logging were carried out on a metre by metre basis and at time of drilling. Surface core and RC logging completed by previous operators assumed to be to industry standard.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is Qualitative and Quantitative and all core is photographed both wet and dry (some older core is pre-digital, photos not all reviewed). Visual estimates of sulphide, quartz alteration as percentages. Selected RC chip trays are archived.

Criteria	JORC Code explanation	Commentary
	The total length and percentage of the relevant intersections logged.	100% of the drill core is logged. 100% of RC drilling is logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	DD – Core is half cut with an Almonté diamond core saw. Sample intervals are defined by a qualified geologist to honour geological boundaries. The left half is archived. All major mineralised zones are sampled, plus associated visibly barren material, >5m of mineralised zones. Ideally, sample intervals are to be 1m in length, though range from 0.3m to 4.0m in length. Total weight of each sample generally does not exceed 5kg. Following drying at 105°C to constant mass, all samples below approximately 4kg are totally pulverised in LM5's to nominally 90% passing a 75µm screen. The very few samples generated above 4kg are crushed to <6mm and riffle split first prior to pulverisation. For RC drilling, duplicate samples are taken from the cone splitter at an incidence of 1 in 25 samples. Repeat analysis of pulp samples (for all sample types – diamond, RC, rock and soil) occurs at an incidence of 2 in 50 samples. No formal heterogeneity study has been carried out or nomograph plotted. An informal analysis suggests that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results. All samples are oven-dried overnight (max 1200), jaw crushed to <6mm, and split to <3kg in a static riffle splitter. The coarse reject is then discarded. The remainder is pulverised in an LM5 to >85% passing 75µm (Tyler 200 mesh) and bagged. The analytical sample is further reduced to a 30gm charge weight using a spatula, and the pulp packet is stored awaiting collection by NSR. For older pre- NSR samples, best practice is assumed.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	RC - Rig-mounted static cone splitter used for dry samples. Pre NSR RC sub sampling assumed to be at industry standard at that time.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Following drying at 105°C to constant mass, all samples below approximately 4kg are totally pulverised in LM5's to nominally 90% passing a 75µm screen. The very few samples generated above 4kg are crushed to <6mm and riffle split first prior to pulverisation. No formal heterogeneity study has been carried out or nomograph plotted. An informal analysis suggests that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results. For older pre- NSR samples, best practice is assumed.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	For RC drilling, duplicate samples are taken from the cone splitter at an incidence of 1 in 25 samples. Repeat analysis of pulp samples (for all sample types – diamond, RC, rock and soil) occurs at an incidence of 2 in 50 samples. For drill core the external labs coarse duplicates are used. RC drilling by previous operators to industry standard at the time. With new database protocol, older QAQC data is being retrieved but was not reviewed at the time of this report.
	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.	Field duplicates, i.e. other half of cut core, have not been routinely assayed. RC drilling by previous operators assumed to be to industry standard at that time.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	For all NSR drill core samples, gold concentration is determined by fire assay using the lead collection technique with a 30 gram (or 50g depending on which lab was used) sample charge weight. An AAS finish is used, considered to be total gold. Various multi-element suites are analysed using a four-acid digest with an ICP-OES finish. RC drilling by previous operators to industry standard at the time and not reviewed for this Resource.
	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.	Not applicable to this report.

Criteria	JORC Code explanation	Commentary
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	The field QAQC protocols used include the following for all drill samples: ▪ Duplicate samples are taken from the cone splitter at an incidence of 1 in 25 samples, ▪ Coarse blanks are inserted at an incidence of 1 in 30 samples, ▪ Commercially prepared certified reference materials (CRM) are inserted at an incidence of 1 in 25 samples. The CRM used is not identifiable to the laboratory, ▪ NSR's QAQC data is assessed on import to the database and reported monthly and yearly. The laboratory QAQC protocols used include the following for all drill samples: ▪ Repeat analysis of pulp samples occurs at an incidence of 2 in 50 samples, ▪ Screen tests (percentage of pulverised sample passing a 75µm mesh) are undertaken on 1 in 100 samples, ▪ The laboratories own standards are loaded to the NST database, ▪ The laboratory reports its own QAQC data on a quarterly basis. ▪ In addition to the above, about 5% of samples are sent to an umpire laboratory. ▪ Failed standards are followed up by re-assaying a second 50g pulp sample of all samples in the fire above 0.1ppm by the same method at the primary laboratory. Both the accuracy component (CRM's and umpire checks) and the precision component (duplicates and repeats) of the QAQC protocols are thought to demonstrate acceptable levels of accuracy and precision. QAQC protocols for Surface RC and diamond drilling by previous operators unknown, assumed to be industry standard.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections not verified.
	The use of twinned holes.	There are no purpose twinned holes.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	NSR data was hard keyed or copied into excel spreadsheets for transfer and storage in an access database, now replaced by SQL database and more automated data entry. Hard copies of NSR core assays and surveys are kept at head office. Visual checks are part of daily use of the data in Vulcan. Data from previous operators thoroughly vetted and imported to Access initially, now SQL database.
	Discuss any adjustment to assay data.	No adjustments are made to any assay data. First gold assay is utilised for any Resource estimation. Some minor adjustments have been made to overlapping data.
Location of data points	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.	NSR collar positions were surveyed using DGPS, and were set-out and picked-up in MGA 1994 Zone 50 grid. This information is digitally transferred to the geology database. Multi shot cameras and gyro units were used for down-hole survey. Previous drilling has been set-out and picked up in both national and local grids using a combination of GPS and Survey instruments, and are assumed to be to NST standards.
	Specification of the grid system used.	MGA94 grid, zone 50
	Quality and adequacy of topographic control.	Topographic control is from the Fugro 2002 Aerial photo data and site surveyed pit pickups. Accuracy would be to 10cm within the pits.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing on the order of 20m by 10m in the shallow portions of the deposit. Up to 100m on the down plunge extents.
	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.	The Resource development drilling over the deposit was generally 20m x 20m or better for the indicated Resource and up to 50m x 50m for the inferred Resource. *The data spacing and distribution is sufficient to establish geological and/or grade continuity appropriate for the Mineral Resource and classifications to be applied.*
	Whether sample compositing has been applied.	Core is sampled to geology; sample compositing is not applied until the estimation stage.

Criteria	JORC Code explanation	Commentary
		RC samples initially taken as 4m composites to be replaced by 1 m samples in mineralised zones though it is unknown at what grade threshold the 1m sub-samples were analysed for. Compositing of the data to 1m was used in the estimate.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The orientation of sampling is generally perpendicular to Zoe shear zone mineralisation and slightly oblique to the main sedimentary beds and mineralisation. Steep topography as also affected the orientation of drilling. The orientation achieves unbiased sampling of all possible mineralisation and the extent to which this is known.
	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.	The drill orientation to mineralised structures biases the number of samples per drill hole. It is not thought to make a material difference in the Resource estimation. As the opportunity arises better angled holes are infill drilled.
Sample security	The measures taken to ensure sample security.	All samples are selected, cut and bagged in tied numbered calico bags, grouped in larger tied plastic bags, and placed in large sample cages with a sample submission sheet. The cages are transported via freight truck to Perth, with consignment note and receipted by external and independent laboratory. All sample submissions are documented and all assays are returned via email. Sample pulp splits are returned to NSR via return freight and stored in shelved containers at the Paulsens mine site. Pre NSR operator sample security assumed to be similar and adequate.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	There has been no audit of the sampling techniques, however all recent NST sample data has been extensively QAQC reviewed both internally and externally. Pre NSR data audits found to be light on in regard to QAQC though in line with industry standards of the time.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	M52/639 is wholly owned by NSR (Northern Star Resources Limited) and in good standing. There are no heritage issues with the current operation. Relationship with the traditional owners is good, though contact has become very limited. Several heritage surveys have been completed and there are no heritage issues with the current planned pit extents.
	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.	M52/639 granted for 25/11/1996 for 21 years.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Data relevant to this Resource was predominantly collected by SIPA who operated the Mt Olympus mine from start up to closure, previous to the NSR purchase. Gold mineralisation was discovered in 1988 by BP minerals. All previous work is accepted and assumed to industry standard at that time.
Geology	Deposit type, geological setting and style of mineralisation.	Mount Olympus is a medium grade, structurally-controlled, sediment hosted epigenetic gold deposit. Mineralisation is hosted mainly by thick tensional quartz veins cross cutting bedding parallel shears.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many (692) holes to practically summarise all drill information used. (See diagram). The detail is available in the Dec 2012 Resource Report.

Criteria	JORC Code explanation	Commentary
	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.	Exclusion of the drill information will not detract from the understanding of the report. Holes are close spaced and tightly constrained to an active mine area.
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Not Applicable. Exploration results previously released.
	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.	Not Applicable. Exploration results previously released.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	Exploration results previously released by NSR, do include an estimate of true thickness.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Due to complex mineralisation geometry and varying intercept angles the true thickness is manually estimated on a hole by hole basis.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Exploration results previously released with downhole depth and estimated true thickness.
Diagrams	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.	See long section in main release and previous ASX releases (18/2/2011, 27/9/11, 2/12/11, 6/3/12, 12/3/12,1/7/12, 26/7/12, 27/8/12, 10/9/12, 7/2/13). Plan view and long section view of Mt Olympus showing drill collars is attached.
Balanced reporting	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.	When previously reported by NSR, exploration results do include all intersections for the period / area.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Exploration results not being released at this time.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	A program of 13,000m (both RC and Diamond) is currently on hold, primarily due to current gold price and focus on other projects. This drilling would aid a pit optimization, test for free milling (oxide) extensions, test deeper plunge extensions and test high grade underground targets. A Metallurgical test study is also currently on hold.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Part of main announcement.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	NSR (Northern Star Resources Limited) sampling and logging data is digitally entered into OCRISS then transferred to an SQL based database. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly to the database from lab, logging and survey derived files. Pre NSR data considered correct, has been maintained by SIPA company database administrators.
	Data validation procedures used.	Pre NSR data has been partially validated by internal database administrators.

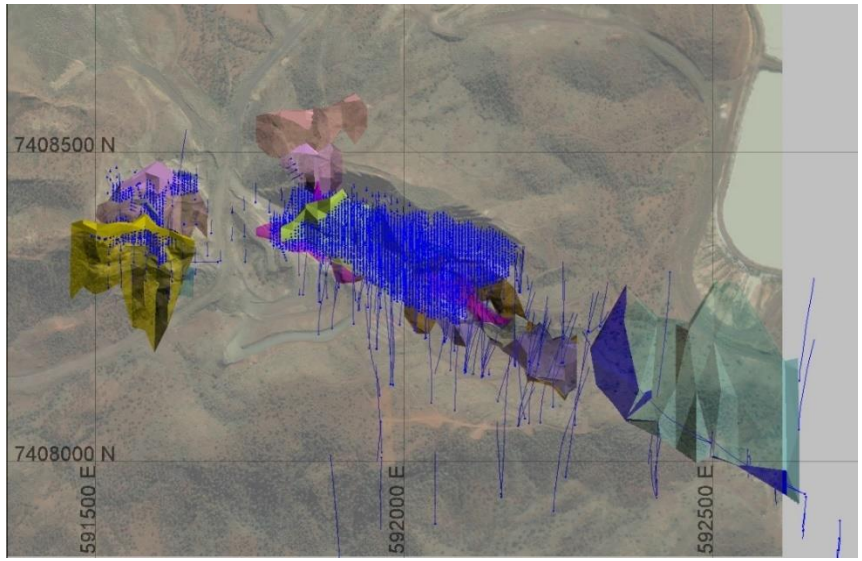
Criteria	JORC Code explanation	Commentary
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person for this Resource report has worked on site for extensive periods between 2012 and 2013.
	If no site visits have been undertaken indicate why this is the case.	Site visits have been undertaken.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource using Vulcan software. The confidence in the geological interpretation is high with all the information and 5 years of open pit operation.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drilling, oxidation surfaces, and underground style high grade ore zone interpretations.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed or put forward.
	The use of geology in guiding and controlling Mineral Resource estimation.	Drill core logging and pit development data used to create 3D constrained wireframes.
	The factors affecting continuity both of grade and geology.	Continuity of the grade closely follows sedimentary bedding planes, particularly the coarser grained units.
Dimensions	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.	Strike length = 800m (east – west); Width = 200m (North-south); Depth = surface to -90mRl (~500m below surface).
Estimation and modelling techniques	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.	Compositing of drill-hole samples was completed against one mineralised domain at 1m (downhole) intervals. The ordinary kriging interpolation (OK) method was used in the first 2 passes of the estimation. A final nearest neighbor method was used to fill empty blocks. 73% of blocks were estimated in the first 2 passes Maximum distance of extrapolation from data points was statistically determined and varies by domain Vulcan software was used for data compilation, domain wire framing, calculating and coding composite values and reporting. Block model volumes were compared to wireframe volumes to validate sub-blocking.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Reconciled historical production from open pit operations is comparable with new estimate.
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The parent block size is 10m (Y) x 10m (X) x 10m (Z), with sub-block to 1.25m x 1.25m x 1.25m. Average sample spacing is 20 by 20 or better for the main part of the Resource, up to 20m by 40m on the peripheries.
	Any assumptions behind modelling of selective mining units.	A 3m minimum mining width for both the surface and underground environment is assumed.
	Any assumptions about correlation between variables.	In the fresh material, there is a correlation between the Au grade and the bulk density measurement (see bulk density section).
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill core logs, mapping and grade. Low grades can form part of an ore wireframe. Estimations are constrained by the interpretations.
	Discussion of basis for using or not using grade cutting or capping.	Top cuts were determined by statistical techniques and vary by domain.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Block grades are assessed against drill hole data visually, by using swath plots and de-clustered means.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis. Moisture content within the ore is expected to be low.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Reporting cut off = 0.7gpt. Modelling lower grade cut off = 0.5gpt nominally.

Criteria	JORC Code explanation	Commentary
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	The Resource has been created based on open pit and underground mining methods.
Metallurgical factors or assumptions	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.	The metallurgical conditions and characteristics of the Mount Olympus mineralisation are generally known with free milling material mined by Sipa from within oxide zones. Fresh mineralisation is refractory in nature with its high pyrite content and fine gold at times locked within this matrix. Local areas of graphite rich mineralisation have in certain cases preg-robbing properties. Initial test work has shown favorable results, more detailed studies are required. No Metallurgical assumptions have been built into the Resource model.
Environmental factors or assumptions	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 green fields 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.	Mt Olympus was a going concern and as such the previous practice have shown to be effective and practical.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	The bulk density for oxide and transition material was assumed due to the low number of measurements within these zones.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	A total of 4440 bulk density measurements from 30 diamond drill holes have been taken from mineralised and un-mineralised intervals within the project area.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Individual bulk densities are applied in accordance with specific geological units and weathering states. In fresh material, a correlation between the bulk density valve and gold assay grade exists and was used to assign bulk density values.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	The Resource classification is based primarily on the geological and grade continuity as shown by drilling (open pit Grade control data not considered). If a wireframe has been constructed with geological or grade continuity, all block within the wireframe are assigned as inferred. Assignment of the indicated Resource category was done on each ore zone individually using a number of different criteria including: • continuity of both grade and geology; • drill holes' density; • number of passes to fill the blocks; and • Quality of the estimate (kriging efficiency). The halo (non-wireframed material) is assigned a Resource category of inferred if it is within the inferred wireframe and the block is filled in the first pass.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Input and geological data is assumed accurate backed up by previous successful mining operations.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This mineral Resource estimate is considered representative with comments noted in the discussion below.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The Mineral Resource has been subjected to a review by Northern Star Resources' senior technical personal.

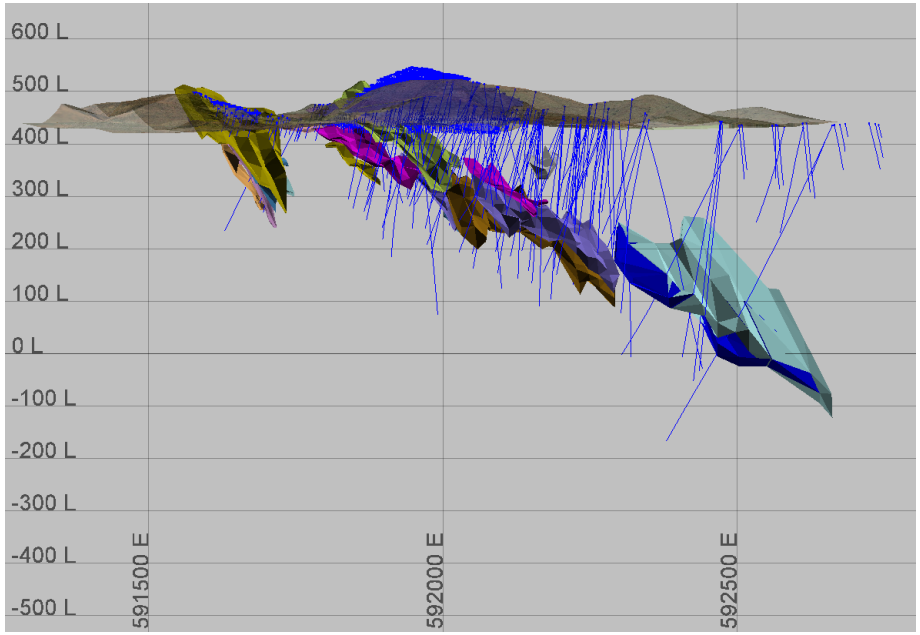
Criteria	JORC Code explanation	Commentary
		The process and validation of Mineral Resource estimates was undertaken by an independent consultant from Optiro.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This mineral Resource estimate is considered as robust and representative of the Mount Olympus mineralisation. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource on a global scale.
	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.	This Resource report relates to the Mt Olympus and West Olympus ore zones and are likely to have local variability. The global assessment is more of a reflection of the average tonnes and grade estimate.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Reconciliation comparison between the previously mined Mount Olympus (including West Olympus) and the MTO_Resource_jan2013 block model is favourable with reported reconciled production of 2.5mt @3gpt for 242koz (Mining cut-off grade is variable but assumed to be 0.7gpt when mined for stockpiling). At 0.7gpt lower cut-off and 92% recovery the block model reports 2.8mt @ 3.0gpt for 243,000koz.

ASHBURTON MT OLYMPUS DEPOSIT - REPRESENTATIVE PLAN & LONG SECTION

Plan View – Mt Olympus deposit



Long Section View – Mt Olympus Deposit



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Reported ore Reserve is based on a previous Resource model by SIPA Exploration (mt_olympus_geoogy25_0304).
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	Mineral Resources are reported inclusive of Ore Reserves.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	No specific site visit was undertaken by the Competent Person.
	If no site visits have been undertaken indicate why this is the case.	Familiarity with the region and a review of satellite imagery and surveyed topography was considered sufficient information to provide the Reserve Estimate.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	Pre-Feasibility Study level.
	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.	Yes.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Break even cut-off of 1.6gpt applied, based ultimate pit shells, modified for mining practicalities, and expected operating costs, revenue and recoveries.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Whittle shells initially then fully designed pit shapes.
	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.	Deemed appropriate.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	Geotechnical parameters based on historical mining at Ashburton. Bench height- 5m, Batter angle 55^0, Berm width 4m.
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	mt_olympus_geoogy25_0304 used for pit optimisations, oxidised and transitional material only.
	The mining dilution factors used.	10%.
	The mining recovery factors used.	95%.
	Any minimum mining widths used.	One of the major limitations of pit optimisation packages is that an optimisation cannot be run with defined practical minimum mining widths and as such it is possible, when looking at deposits that have been previously mined, to end up with a pushback that is so small that it could not physically be mined. As such, optimisation results must be further analysed to understand the practicality of the results.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Only measured and indicated blocks are used.
	The infrastructure requirements of the selected mining methods.	Camp, workshop, office, water bores, ROM pad.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	Assumed that material will be trucked and processed in the Paulsens Mill. Fresh material recovery was set to 0% to exclude it from the Estimate pending further study. Oxide recovery was estimated at 90%, transitional recovery at 80%.
	Whether the metallurgical process is well-tested technology or novel in nature.	Well tested for oxide and transitional. Fresh rock processing studies proposed though currently on hold.

Criteria	JORC Code explanation	Commentary
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	5 years processing experience of Ashburton ore by SIPA. The metallurgical domaining is applied through modelled oxidation surfaces though internally can vary due to sulphide content.
	Any assumptions or allowances made for deleterious elements.	No.
	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.	Previously mined and milled Mt Olympus pit.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Yes.
Environmental	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.	Ashburton (Mt Olympus/Peake/Zeus) is currently compliant with all legal and regulatory requirements. To the best of the Competent Person's knowledge, there is no reason to assume any government permits and licenses or statutory approvals will not be granted within expected timeframes.
Infrastructure	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.	There is currently no infrastructure in place at the Ashburton tenement apart from access roads. The Ashburton site will require an accommodation camp, power station, road upgrades, offices and mining workshop. No processing plant or related infrastructure will be required. It is expected that Mt Olympus will carry all infrastructure costs.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	The capital cost estimate is used to provide current costs suitable for use in assessing the economics of the Ore Reserve. The capital cost estimate for the infrastructure is based upon an EPC (Engineering, Procurement and Construct contract) approach.
	The methodology used to estimate operating costs.	The operating cost estimate has been prepared on the basis of contractor mining. The operating costs have been provided by a mining contractor based on the material movement requirements. Site based processing costs from Paulsens to the planned expanded 450kt/a processing facility.
	Allowances made for the content of deleterious elements.	No, none expected.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Revenue was based on a gold price of AUD $1,600/oz.
	The source of exchange rates used in the study.	All economics completed in AUD.
	Derivation of transportation charges.	Mining and Haulage costs are based on contractor estimates and first principle calculations.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Processing costs are based on historical processing data from the plant at Paulsens.
	The allowances made for royalties payable, both Government and private.	WA State Govt. royalty of 2.5%.
Revenue factors	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.	Corporate guidance at the time.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Revenue was based on a gold price of AUD $1,600/0z (which is seen as representative of economic forecasts for the period).
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	All product is sold direct at market prices with no hedges in place.
	A customer and competitor analysis along with the identification of likely market windows for the product.	N/A.
	Price and volume forecasts and the basis for these forecasts.	N/A.
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	N/A.

Criteria	JORC Code explanation	Commentary
Economic	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.	All costs assumptions are made based on historical performance from the plant and quotes from experienced mining contractors. The economic forecast is seen as representative of the current market condition.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	NPV Scheduler pit optimisations were run using gold prices of A$1,750/oz., A$1,600/oz. and A$1,450/oz. at the model cut-off grade of 1.6gpt. At $1,600/oz it results in a positive NPV.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders including traditional land owner claimants.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	
	Any identified material naturally occurring risks.	None.
	The status of material legal agreements and marketing arrangements.	Project will have a negative NPV with lower gold price.
	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.	As this project has been mined in recent history it is anticipated that all necessary required government approvals will be obtained in a timely fashion. Presently there are three areas of immediate concern. These items are significant due to the potential for timing implications. These items include: Existing compliance/status with DMP environmental branch (e.g. rehabilitation commitments; ecologies; soil/AMD); Additional investigations/surveys needed. Currency of former Operating Permits (i.e. Works Approvals).
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves include Proved (if any) and Probable classifications.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	None, Indicated and Measured blocks only used.
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserve has been prepared and peer reviewed by an independent consultant and is in line with current industry standards.
Discussion of relative accuracy/ confidence	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.	Confidence in the Reserve is high based on current industry practices and costs. The oxide material for which the Reserve is based on and the operating parameters of the Paulsens Mill has a high confidence. Further drilling and metallurgical test work will be required to include any of the sulphide material into a Reserve.
	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.	Global estimates.
	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.	N/A.
	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.	Reconciliation comparison between the previously mined Mount Olympus (including West Olympus) and the SIPA model used show a very good comparison to tonnes and reasonable comparison to grade.2.5Mt @ 3gpt produced vs 2.6Mt @ 3.4 modelled.

JORC Code, 2012 Edition – Table 1 Report
Ashburton - Peake Deposit - 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	This deposit is sampled by diamond drilling (DD) and Reverse Circulation (RC) drilling completed by NSR (Northern Star Resources Limited) and previous operators. NSR – DD - Sampled sections are generally NQ2. Core sample intervals are defined by the geologist to honour geological boundaries ranging from 0.3 to 1.5m in length. NSR - RC - Rig-mounted static cone splitter used with the aperture set to yield a primary sample of approximately 4kg for every metre (representing approximately one eighth of the total sample). Off-split retained. RC and DD sampling by previous operators to industry standard at that time often using 1m samples after initial 4m composites. It is unknown what grade threshold triggers the 1m re-samples.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Core is aligned and measured by tape, comparing back to down hole core blocks consistent with industry practice. RC and surface core drilling completed by previous operators to industry standard at that time (1988 initial discovery, to 2004).
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Diamond drilling completed to industry standard using varying sample lengths (0.3 to 1.5m) based on geological intervals, which are then crushed and pulverised to produce a ~200g pulp sub sample to use in the assay process. NSR diamond core samples are fire assayed (50g charge). Visible gold is occasionally encountered in core. RC sampling to industry standard at the time of drilling.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	RC – Reverse circulation drilling is carried out using a face sampling hammer and a 5¼ inch diameter bit NSR surface diamond drilling carried out by using both HQ3 (triple tube) and NQ2 (standard tube) techniques. Sampled sections are generally NQ2. Core is orientated using the ORI-shot device.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	RC – Approximate recoveries are sometimes recorded as percentage ranges based on a visual and weight estimate of the sample. *DD – Recoveries are recorded as a percentage calculated from measured core verses drilled intervals.*
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	NSR diamond drilling practice results in high recovery due to the competent nature of the ground. For RC drilling, efforts are made to ensure good recoveries are achieved by the use of auxiliary compressors and high pressure booster units supplying compressed air at a high enough pressure to keep water from the hole and the samples dry in most circumstances. Where water is encountered in the pre-collar and wet samples result, more frequent cleaning of the cyclone and splitter is carried out and the hole is thoroughly flushed at the end of each sample. RC and diamond drilling by previous operators to industry standard at that time.
	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.	There is no known relationship between sample recovery and grade, diamond drill sample recovery is very high.
Logging	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.	Core and chip samples have been logged by qualified Geologist to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies Percussion holes logging were carried out on a metre by metre basis and at time of drilling. Surface core and RC logging completed by previous operators assumed to be to industry standard.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging is Qualitative and Quantitative and all core is photographed both wet and dry (some older core is pre-digital, photos not all reviewed). Visual estimates of sulphide, quartz alteration as percentages Selected RC chip trays are archived.

Criteria	JORC Code explanation	Commentary
	The total length and percentage of the relevant intersections logged.	100% of the drill core is logged. 100% of RC drilling is logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	DD – Core is half cut with an Almonté diamond core saw. Sample intervals are defined by a qualified geologist to honour geological boundaries. The left half is archived. All major mineralised zones are sampled, plus associated visibly barren material, >5m of mineralised zones. Ideally, sample intervals are to be 1m in length, though range from 0.3m to 4.0m in length. Total weight of each sample generally does not exceed 5kg. Following drying at 105°C to constant mass, all samples below approximately 4kg are totally pulverised in LM5's to nominally 90% passing a 75µm screen. The very few samples generated above 4kg are crushed to <6mm and riffle split first prior to pulverisation. For RC drilling, duplicate samples are taken from the cone splitter at an incidence of 1 in 25 samples. Repeat analysis of pulp samples (for all sample types – diamond, RC, rock and soil) occurs at an incidence of 2 in 50 samples. No formal heterogeneity study has been carried out or nomograph plotted. An informal analysis suggests that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results. All samples are oven-dried overnight (max 1200), jaw crushed to <6mm, and split to <3kg in a static riffle splitter. The coarse reject is then discarded. The remainder is pulverised in an LM5 to >85% passing 75µm (Tyler 200 mesh) and bagged. The analytical sample is further reduced to a 30gm charge weight using a spatula, and the pulp packet is stored awaiting collection by NSR. For older pre- NSR samples, best practice is assumed.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	RC - Rig-mounted static cone splitter used for dry samples. Pre NSR RC sub sampling assumed to be at industry standard at that time.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Following drying at 105°C to constant mass, all samples below approximately 4kg are totally pulverised in LM5's to nominally 90% passing a 75µm screen. The very few samples generated above 4kg are crushed to <6mm and riffle split first prior to pulverisation. No formal heterogeneity study has been carried out or nomograph plotted. An informal analysis suggests that the sampling protocol currently in use are appropriate to the mineralisation encountered and should provide representative results. For older pre- NSR samples, best practice is assumed.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	For RC drilling, duplicate samples are taken from the cone splitter at an incidence of 1 in 25 samples. Repeat analysis of pulp samples (for all sample types – diamond, RC, rock and soil) occurs at an incidence of 2 in 50 samples. For drill core the external labs coarse duplicates are used. RC drilling by previous operators to industry standard at the time. With new database protocol, older QAQC data is being retrieved but was not reviewed at the time of this report.
	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.	Field duplicates, i.e. other half of cut core, have not been routinely assayed. RC drilling by previous operators assumed to be to industry standard at that time.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	For all NSR drill core samples, gold concentration is determined by fire assay using the lead collection technique with a 30 gram (or 50g depending on which lab was used) sample charge weight. An AAS finish is used, considered to be total gold. Various multi-element suites are analysed using a four-acid digest with an ICP-OES finish. RC drilling by previous operators to industry standard at the time and not reviewed for this Resource.
	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.	Not applicable to this report.

Criteria	JORC Code explanation	Commentary
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	The QAQC protocols used include the following for all NSR drill samples: The field QAQC protocols used include the following for all drill samples: • Duplicate samples are taken from the cone splitter at an incidence of 1 in 25 samples, • Coarse blanks are inserted at an incidence of 1 in 30 samples, • Commercially prepared certified reference materials (CRM) are inserted at an incidence of 1 in 25 samples. The CRM used is not identifiable to the laboratory, • NSR's QAQC data is assessed on import to the database and reported monthly and yearly. The laboratory QAQC protocols used include the following for all drill samples: • Repeat analysis of pulp samples occurs at an incidence of 2 in 50 samples, • Screen tests (percentage of pulverised sample passing a 75µm mesh) are undertaken on 1 in 100 samples, • The laboratories own standards are loaded to the NST database, • The laboratory reports its own QAQC data on a quarterly basis. • In addition to the above, about 5% of samples are sent to an umpire laboratory. • Failed standards are followed up by re-assaying a second 50g pulp sample of all samples in the fire above 0.1ppm by the same method at the primary laboratory. Both the accuracy component (CRM's and umpire checks) and the precision component (duplicates and repeats) of the QAQC protocols are thought to demonstrate acceptable levels of accuracy and precision. QAQC protocols for Surface RC and diamond drilling by previous operators unknown, assumed to be industry standard.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections not verified.
	The use of twinned holes.	There are no purpose twinned holes.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	NSR data was hard keyed or copied into excel spreadsheets for transfer and storage in an access database, now replaced by SQL database and more automated data entry. Hard copies of NSR core assays and surveys are kept at head office. Visual checks are part of daily use of the data in Vulcan. Data from previous operators thoroughly vetted and imported to Access initially, now SQL database.
	Discuss any adjustment to assay data.	No adjustments are made to any assay data. First gold assay is utilised for any Resource estimation. Some minor adjustments have been made to overlapping data.
Location of data points	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.	NSR collar positions were surveyed using DGPS, and were set-out and picked-up in MGA 1994 Zone 50 grid. This information is digitally transferred to the geology database. Multi shot cameras and gyro units were used for down-hole survey. Previous drilling has been set-out and picked up in both national and local grids using a combination of GPS and Survey instruments, and are assumed to be to NST standards.
	Specification of the grid system used.	MGA94 grid, zone 50.
	Quality and adequacy of topographic control.	Topographic control is from the Fugro 2002 Aerial photo data and site surveyed pit pickups. Accuracy would be to 10cm within the pits.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing on the order of 20m by 20m in the shallow portions of the deposit. Up to 200m by 200m on the down plunge extents.
	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.	*The data spacing and distribution is sufficient to establish geological and/or grade continuity appropriate for the Mineral Resource and classifications to be applied.*
	Whether sample compositing has been applied.	Core is sampled to geology; sample compositing is not applied until the estimation stage.

Criteria	JORC Code explanation	Commentary
		RC samples initially taken as 4m composites to be replaced by 1 m samples in mineralised zones though it is unknown at what grade threshold the 1m sub-samples were analysed for. Compositing of the data to 1m was used in the estimate.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The orientation of sampling is generally perpendicular to mineralisation. Steep topography may also have affected the orientation of drilling. The orientation achieves unbiased sampling of all possible mineralisation and the extent to which this is known.
	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.	The drill orientation to mineralised structures biases the number of samples per drill hole. It is not thought to make a material difference in the Resource estimation. As the opportunity arises better angled holes are infill drilled.
Sample security	The measures taken to ensure sample security.	All samples are selected, cut and bagged in tied numbered calico bags, grouped in larger tied plastic bags, and placed in large sample cages with a sample submission sheet. The cages are transported via freight truck to Perth, with consignment note and receipted by external and independent laboratory All sample submissions are documented and all assays are returned via email. Sample pulp splits are returned to NSR via return freight and stored in shelved containers at the Paulsens mine site Pre NSR operator sample security assumed to be similar and adequate.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	There has been no audit of the sampling techniques, however all recent NST sample data has been extensively QAQC reviewed both internally and externally. Pre NSR data audits found to be light on in regard to QAQC though in line with industry standards of the time

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	M52/734 is wholly owned by NSR (Northern Star Resources Limited) and in good standing. There are no heritage issues with the current operation. Relationship with the traditional owners is good, though contact has become very limited. A new heritage survey will be required for further deep drilling and pit expansions.
	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.	M52/734 granted 9/5/2001 for 21 years.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Data relevant to this Resource was collected by Sipa who operated the Mt Olympus mine from start up to closure, previous to the NSR purchase. All previous work is accepted and assumed to industry standard at that time.
Geology	Deposit type, geological setting and style of mineralisation.	Peake is a medium grade, structurally-controlled, sediment hosted epigenetic gold deposit. Mineralisation is hosted mainly within in a vertical, bedding parallel shear zone.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Too many (408) holes to practically summarise all drill information used. (See diagram). The detail is available in the Dec 2012 Resource Report.
	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.	Exclusion of the drill information will not detract from the understanding of the report. Holes are close spaced and tightly constrained to an active mine area.

Criteria	JORC Code explanation	Commentary
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Not Applicable. Exploration results previously released.
	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.	Not Applicable. Exploration results previously released.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	Exploration results previously released by NSR, do include an estimate of true thickness.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Drill hole angle to orientation of mineralisation is perpendicular to 45 degrees at most.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	Exploration results previously released with downhole depth and estimated true thickness.
Diagrams	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.	See previous ASX releases (18/2/2011, 27/9/11, 2/12/11, 6/3/12, 12/3/12,1/7/12, 26/7/12, 27/8/12, 10/9/12, 7/2/13). Plan view and long section view of Peake area collars and all drill traces used is attached.
Balanced reporting	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.	When previously reported by NSR, exploration results do include all intersections for the period / area.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Exploration results not being released at this time.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	A program of 11,000m (both RC and Diamond) is currently on hold, primarily due to current gold price and focus on other projects. This drilling would aid a pit optimization, test for free milling (oxide) extensions and test deeper plunge extensions A Metallurgical test study is also currently on hold.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Part of main announcement.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	NSR (Northern Star Resources Limited) sampling and logging data is digitally entered into OCRISS then transferred to an SQL based database. There are checks in place to avoid duplicate holes and sample numbers. Where possible, raw data is loaded directly to the database from lab, logging and survey derived files. Pre NSR data considered correct, has been maintained by Sipa company database administrators.
	Data validation procedures used.	Pre NSR data has been partially validated by internal database administrators.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	The competent person for this Resource has worked on site for extensive periods between 2012 and 2013.
	If no site visits have been undertaken indicate why this is the case.	Site visits have been undertaken.

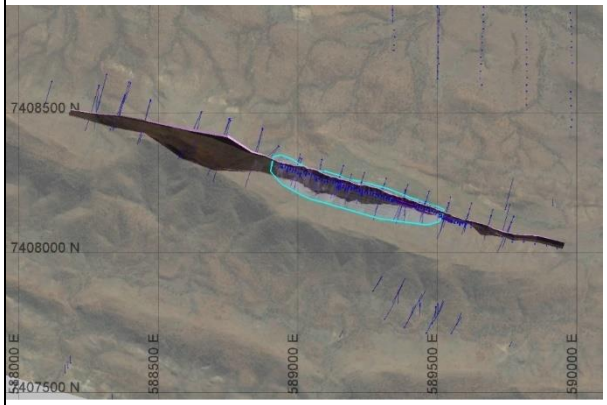
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology and estimated mineral Resource using Vulcan software. The confidence in the geological interpretation is high with all the information and several years of open pit operation.
	Nature of the data used and of any assumptions made.	All available geological data was used in the interpretation including mapping, drilling, oxidation surfaces, and underground style high grade ore zone interpretations.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations have been completed or put forward.
	The use of geology in guiding and controlling Mineral Resource estimation.	Drill core logging and pit development data used to create 3D constrained wireframes.
	The factors affecting continuity both of grade and geology.	Mineralisation is hosted within shallower south dipping siltstones of the Mount McGrath formation. Its true width is approximately 2 to 4 metres and is very continuous along strike. Mineralisation is easily identifiable in the pit as a strongly foliated pale cream siltstone that is carbonate, silica and sericite altered. The siltstone may contain ex-pyrite as well as primary sulphides at depth. Gold is generally found within stringers and veinlets of quartz within this zone. There is a sharp grade cut-off on the hangingwall side of the structure and it is marked by a change into a more hematite-rich siltstone. The grade boundary is more diffuse on the footwall side of mineralisation.
Dimensions	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.	Strike length = 1850m (east – west); Width = 5-10m (North-south); Depth = surface to 50mRL (~450m below surface).
Estimation and modelling techniques	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.	Compositing of drill-hole samples was completed against one mineralised domain at 1m (downhole) intervals. The ordinary kriging interpolation (OK) method was used in the first 2 passes of the estimation. A final nearest neighbor method was used to fill empty blocks. 99.3% of the blocks were filled in the first 2 passes. Maximum distance of extrapolation from data points was statistically determined and varies by domain Vulcan software was used for data compilation, domain wire framing, calculating and coding composite values and reporting. Block model volumes were compared to wireframe volumes to validate sub-blocking.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Reconciled historical production from open pit operations is comparable with new estimate
	The assumptions made regarding recovery of by-products.	No assumptions are made and only gold is defined for estimation.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The parent block size is 16m (Y) x 8m (X) x 8m (Z), with sub-block to 1m x 0.5m x 0.5m. Drill hole spacing varies from 5m to 200m. Average sample spacing is 40 by 40 or better for the main part of the Resource, up to 40m by 120m on the peripheries.
	Any assumptions behind modelling of selective mining units.	A 3m minimum mining width for both the surface and underground environment is assumed.
	Any assumptions about correlation between variables.	N/A.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill core logs, mapping and grade. Low grades can form part of an ore wireframe. Estimations are constrained by the interpretations.
	Discussion of basis for using or not using grade cutting or capping.	Top cuts were determined by statistical techniques and vary by domain.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Three validation processes were used to compare the block model against drill-hole data, including visual, declustered means and Swath plots.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis. Moisture content within the ore is expected to be low.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Reporting cut off = 0.9gpt. Modelling lower grade cut off = 0.5gpt nominally.

Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	It is assumed that the surface portion of the Resource will be mined via conventional surface mining techniques (diesel excavator and haul truck). Mining of the underground portion of the Resource has been assumed to be via conventional underground mining technique.
Metallurgical factors or assumptions	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.	The metallurgical conditions and characteristics of the Peake mineralisation are generally known with free milling material mined by Sipa from within oxide zones. Fresh mineralisation is refractory in nature with its high pyrite content and fine gold at times locked within this matrix. Initial test work has shown favorable results, more detailed studies are required. No Metallurgical assumptions have been built into the Resource model
Environmental factors or assumptions	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 green fields 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.	Peake was a going concern and as such the previous practice have shown to be effective and practical.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Specific Gravity (SG) or Bulk Density measurement data were conducted on diamond core samples from the Peake deposit. A total of 898 Specific gravity measurements were taken from 12 NST drill core. The method used was the submersion technique as stated in procedure IMS-EXP_SWP_XXX Specific Gravity Procedure (see Appendix 4). Most the specific gravity measurements were conducted on fresh material. Fresh un-mineralised material was given SG of 2.95 given as a result of NST SG measurement at Peake and MT Olympus (similar geology). The average SG given to fresh mineralized material (inside ore wireframes) was 3.10. This is due to the increase in heavy sulphide minerals (pyrite). For transitional material, a conservative Specific Gravity measurement of 2.75 was used considering SG's from current data, previous Resource models and Mount Olympus which has similar geology. For oxide material, a conservative SG of 2.65 was given. This considers current data and previous Resource models and reconciled data from mining the open pit.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	A total of 899 bulk density measurements from 12 recent diamond drill holes have been taken from mineralised and un-mineralised intervals within the project area.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Individual bulk densities are applied in accordance with specific geological units and weathering states.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	The Resource classification is based primarily on the geological and grade continuity as shown by drilling (open pit Grade control data not considered). If a wireframe has been constructed with geological or grade continuity, all block within the wireframe are assigned as inferred. Assignment of the indicated Resource category was done on each ore zone individually using several different criteria including. • continuity of both grade and geology. • drill holes' density. • number of passes to fill the blocks and • Quality of the estimate (kriging efficiency). The Halo (non-wire framed material) is assigned a Resource category of inferred if it is within the inferred wireframe and the block is filled in the first pass.

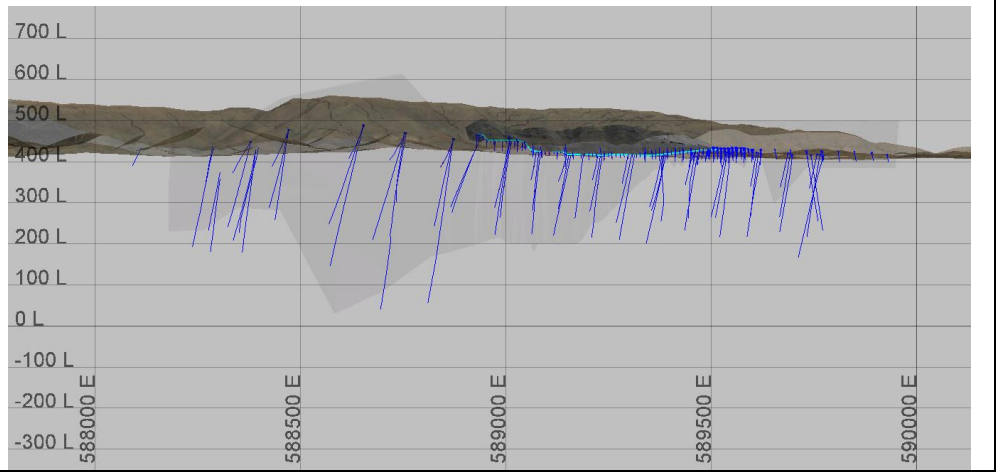
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Input and geological data is assumed accurate backed up by previous successful mining operations
	Whether the result appropriately reflects the Competent Person's view of the deposit.	This Mineral Resource estimate is considered representative with comments noted in the discussion below.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The Mineral Resource has been subjected to a review by Northern Star Resources' senior technical personal. The process and validation of Mineral Resource estimates was undertaken by an independent consultant from Optiro.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	This mineral Resource estimate is considered as robust and representative of the Peake mineralisation. The application of geostatistical methods has helped to increase the confidence of the model and quantify the relative accuracy of the Resource on a global scale.
	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.	This Resource report relates to the Peake ore zones and are likely to have local variability. The global assessment is more of a reflection of the average tonnes and grade estimate.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Reconciliation comparison between the previously mined Peake and this the Peake_Resource_final Mar_2013 block model is favourable with reported reconciled production of 0.08mt @ 7gpt for 15koz (Mining cut-off grade is variable but assumed to be 0.9gpt). At 0.9gpt lower cut-off and 92% recovery the block model reports 0.08mt @ 6.4gpt for 15.8koz.

PEAKE DEPOSIT - REPRESENTATIVE PLAN & LONG SECTION

Plan View – Peake deposit



Long Section View - 7408250N looking north – Peake with drillhole traces and mineralised domains. Grade contol holes shown, but not used for estimation. Current Peake pit extents shown in light blue.



Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.	Reported ore Reserve is based on a previous model by MPR Geological consultants in February 2012.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	Mineral Resources are reported inclusive of Ore Reserves.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	No specific site visit was undertaken by the Competent Person.
	If no site visits have been undertaken indicate why this is the case.	Familiarity with the region and a review of satellite imagery and surveyed topography was considered sufficient information to provide the Reserve Estimate.
Study status	The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.	Pre-Feasibility Study level.
	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.	Yes.
Cut-off parameters	The basis of the cut-off grade(s) or quality parameters applied.	Break even cut-off of 1.6gpt applied based on expected operating costs, revenue and recoveries.
Mining factors or assumptions	The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).	Whittle shells initially then fully designed pit shapes.
	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.	Deemed appropriate.
	The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.	The geotechnical parameters used in the optimisation and design were taken from the existing pits. Mining ceased in 2001 after a project duration of nearly three years. During this period and up to the present time, the walls have stood up well. For this reason, it was decided that the same parameters be used in the proposed cutbacks. Bench height -10m, Batter angle 55^0, Berm width 3m. Overall slope angles are 45^0
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	MPR 201202 Peake model. Used for pit optimisations, oxidised and transitional material only.
	The mining dilution factors used.	10%.
	The mining recovery factors used.	95%.
	Any minimum mining widths used.	One of the major limitations of pit optimisation packages is that an optimisation cannot be run with defined practical minimum mining widths and as such it is possible, when looking at deposits that have been previously mined, to end up with a pushback that is so small that it could not physically be mined. As such, optimisation results must be further analysed to understand the practicality of the results.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	Only measured and indicated blocks are used.
	The infrastructure requirements of the selected mining methods.	Camp, workshop, office, water bores, ROM pad will be part of nearby Mt Olympus project.
Metallurgical factors or assumptions	The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.	Assumed that material will be trucked and processed in the Paulsens Mill. Fresh material recovery was set to 0% to exclude it from the Estimate pending further study. Oxide recovery was estimated at 90%, transitional recovery at 80%.

Criteria	JORC Code explanation	Commentary
	Whether the metallurgical process is well-tested technology or novel in nature.	Well tested for oxide and transitional. Fresh rock processing studies proposed though currently on hold.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	5 years processing experience of Ashburton ore by Sipa. The metallurgical domaining is applied through modelled oxidation surfaces though internally can vary due to sulphide content.
	Any assumptions or allowances made for deleterious elements.	No.
	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.	Previously mined and milled Peake pit.
	For minerals that are defined by a specification, has the ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?	Yes.
Environmental	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.	Ashburton (Mt Olympus/Peake/Zeus) is currently compliant with all legal and regulatory requirements. To the best of the Competent Person's knowledge, there is no reason to assume any government permits and licenses or statutory approvals will not be granted within expected timeframes Northern Star has commissioned 'Significant Environmental Services' to assist with the approvals process which is continuing.
Infrastructure	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.	There is currently no infrastructure in place at the Ashburton tenement apart from access roads. The Ashburton site will require an accommodation camp, power station, road upgrades, offices and mining workshop. No processing plant or related infrastructure will be required. It is expected that Mt Olympus will carry all infrastructure costs.
Costs	The derivation of, or assumptions made, regarding projected capital costs in the study.	Capital cost to be carried by the Mt Olympus project.
	The methodology used to estimate operating costs.	The operating cost estimate has been prepared on the basis of contractor mining. The operating costs have been provided by a mining contractor based on the material movement requirements. Site based processing costs from Paulsens to the planned expanded 450kt/a processing facility.
	Allowances made for the content of deleterious elements.	No, none expected.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Revenue was based on a gold price of AUD $1600.
	The source of exchange rates used in the study.	All economics completed in AUD.
	Derivation of transportation charges.	Mining and Haulage costs are based on contractor estimates and first principle calculations.
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Processing costs are based on historical processing data from the plant at Paulsens.
	The allowances made for royalties payable, both Government and private.	WA State Govt. royalty of 2.5%.
Revenue factors	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.	Corporate guidance at the time.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Revenue was based on a gold price of AUD $1,600/oz (which is seen as representative of current economic forecasts for the period).
Market assessment	The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.	All product is sold direct at market prices with no hedges in place.
	A customer and competitor analysis along with the identification of likely market windows for the product.	N/A
	Price and volume forecasts and the basis for these forecasts.	N/A
	For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.	N/A

Criteria	JORC Code explanation	Commentary
Economic	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.	All costs assumptions are made based on historical performance from the plant and quotes from experienced mining contractors. The economic forecast is representative of the market condition.
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	NPV Scheduler pit optimisations were run using gold prices of A$1,750/oz., A$1,600/oz. and A$1,450/oz. at the model cut-off grade of 1.6gpt. At $1,600/oz the NPV is positive.
Social	The status of agreements with key stakeholders and matters leading to social licence to operate.	Agreements are in place and are current with all key stakeholders including traditional land owner claimants.
Other	To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:	
	Any identified material naturally occurring risks.	None.
	The status of material legal agreements and marketing arrangements.	Project will have a negative NPV with lower gold price.
	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.	As this project has been mined in recent history it is anticipated that all necessary required government approvals will be obtained in a timely fashion. Presently there are three areas of immediate concern. These items are significant due to the potential for timing implications. These items include: Existing compliance/status with DMP environmental branch (e.g. rehabilitation commitments; ecologies; soil/AMD); Additional investigations/surveys needed. Currency of former Operating Permits (i.e. Works Approvals)
Classification	The basis for the classification of the Ore Reserves into varying confidence categories.	All Ore Reserves include Proved (if any) and Probable classifications.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The results appropriately reflect the Competent Persons view of the deposit.
	The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	
Audits or reviews	The results of any audits or reviews of Ore Reserve estimates.	The Ore Reserve has been prepared and peer reviewed by an independent consultant and is in line with current industry standards.
Discussion of relative accuracy/ confidence	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.	Confidence in the Reserve is high based on current industry practices and costs. The oxide material for which the Reserve is based on and the operating parameters of the Paulsens Mill has a high confidence. Further drilling and metallurgical test work will be required to include any of the sulphide material into a Reserve.
	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.	Global estimates.
	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.	N/A
	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.	Reconciliation comparison between the previously mined Peake and this the Peake_Resource_final Mar_2013 block model is favourable with reported reconciled production of 0.08mt @ 7gpt for 15koz (Mining cut-off grade is variable but assumed to be 0.9gpt). At 0.9gpt lower cut-off and 92% recovery the block model reports 0.08mt @ 6.4gpt for 15.8koz.

JORC Code, 2012 Edition – Table 1 Report
Central Tanami JV – 30 June 2017
Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	Sampling was completed using diamond (DD) core or reverse circulation (RC) drilling. Some drill-holes were pre-collared using RC drilling methods and completed with DD tails while others were drilled DD core from surface.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Diamond drilling used NQ2 sized core (minor HQ3 used). Drill core was oriented, aligned and half-cut using metre intervals and geologically determined intervals (min 0.3 metres) with geologically determined intervals taking precedence.
	Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Samples were dispatched to ALS Perth for preparation by drying, crushing to <6mm for samples <3kg (sample >3kg are crushed to 2mm then rotary split), and pulverising the entire sample to <75µm. Bulk pulp splits (300g) were then taken for fire assay purposes. Fire assay was conducted using a 50g charge and an AAS finish.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	RC drilling used a 5.25" face sampling hammer drill bit. Diamond core (including tails) was NQ2 size and oriented where possible (using an in-line core orientation tool).
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	DD core recoveries are recorded as a percentage calculated from measured core versus drilled intervals length.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	The DD contractors adjusted their rate of drilling and method if recovery issues arose. All recovery was recorded by the drillers on core blocks. This was checked and compared to the measurements of the core by the geological team. Any issues were communicated back to the drilling contractor at the time and necessary adjustments made.
	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.	Overall DD recoveries were good. There has been no work completed to determine if any relationship between recovery and grade exists.
Logging	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.	DD core is logged by company geologists to industry standards. All relevant features such as lithology, structure, texture, grain-size, alteration, oxidation state, vein style and veining percentage per interval, and mineralisation were recorded in the geological logs.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging was quantitative where possible and qualitative elsewhere. All DD core was photographed.
	The total length and percentage of the relevant intersections logged.	The entire length of each RC and DD hole was logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	DD core was cut in half using an Almonté diamond core saw. Half core was sampled on intervals between 0.3 - 1.1m in length honouring lithological boundaries. The right-hand side of the core was bagged as the primary sample for analysis. The remaining half of core was archived and stored for reference.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	RC samples were collected in plastic bags; primary samples were collected as 4m speared composites. Assay results of composite samples with gold grades over 0.5gpt were re-split from their respective 1m bulk sample using a 3-tier riffle splitter.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Sample preparation was conducted at ALS Perth. Samples were dried at less than 110°C to prevent sulphide breakdown. Samples were jaw crushed to a nominal -6mm particle size. If the sample weight is greater than 3kg, a Boyd crusher with rotary splitter is used to reduce the sample size to less than 3kg at a nominal <2mm particle size.

Criteria	JORC Code explanation	Commentary
		The entire crushed sample (if less than 3kg) or sub-sample is then pulverised to 90% passing 75µm, using a Labtechnics LM5 bowl pulveriser. 300g pulp subsamples are then taken with an aluminium scoop and stored in labelled pulp packets.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Grind checks are performed at both the crushing stage (2mm) and pulverising stage (75µm), requiring 90% of material to pass through the relevant size.
	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.	The sample preparation is considered appropriate and to industry standard. No field duplicates were submitted for DD core sampling.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered appropriate.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	A 50g fire assay charge is fired with an introduced lead flux and fired in a typical gas-fired furnace. The resultant "button" was then totally digested by Aqua Regia before using Atomic Absorption Spectroscopy (AAS) determination for gold.
	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.	No geophysical tools were used to determine any element concentrations.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Certified reference materials (CRMs) were inserted into the sample sequence at a rate of 1 per 20 samples to ensure correct calibration. Any values outside of 3 standard deviations were re-assayed with a new CRM. Certified blanks (Bunbury Basalt) were routinely inserted into the sample sequence at a rate of 1 per 25 samples and again specifically after potential or existing high grade mineralisation to test for contamination. Failures of blanks above 0.1gpt were followed up and re-assayed. New pulps were prepared if failures continued.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	All significant intersections were verified by a Northern Star Senior geologist on-site during the drill-hole validation process and later by signed off by a Competent Person, as defined by JORC.
	The use of twinned holes.	No twinned holes were drilled for this data set.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Geological logging was directly entered into LogChief logging package, exported into an Access database on-site. Assay files are loaded directly into the Access database by the Senior on-site geologist. Hardcopy and electronic copies of the data was stored for future reference.
	Discuss any adjustment to assay data.	No adjustments were made to the assay data.
Location of data points	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.	Planned holes were pegged using a Differential GPS by company geologists and field assistants. The final hole collars were surveyed (by company geologist and field assistant) by Differential GPS in the MGA 94_52 grid. The accuracy of the DGPS was validated by an external surveyor using an ultra-accurate temporal multi-satellite corrected RTK jigger. Down-hole surveys were performed using a Reflex Ez-Trac or Ranger camera system, recording the down-hole dip and magnetic azimuth. These results were then uploaded into the Access database. At the completion of a hole, a surface referenced gyro survey was performed and upload into the Access database as well as being validated against single shot downhole surveys.
	Specification of the grid system used.	Collar coordinates were recorded in MGA94 Zone 52.
	Quality and adequacy of topographic control.	Topographic control was established through detailed aerial and ground survey control from previous mining operations.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill-hole spacing across the area varies, although minimum 25m spacing was targeted during the design and drilling phases.
	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.	The drill spacing and geological continuity is sufficient to classify this Resource as Indicated and Inferred.
	Whether sample compositing has been applied.	Samples are composited to 1m as part of the estimation process.

Criteria	JORC Code explanation	Commentary
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The orientation of specific targets is typically well understood and the drilling direction is considered near perpendicular to the orientation of mineralisation.
	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.	No sampling bias is considered to have been introduced by the drilling orientation.
Sample security	The measures taken to ensure sample security.	Prior to laboratory submission, samples are stored by Northern Star Resources in a secure yard. Once submitted to the ALS laboratory, they are stored in a secure fenced compound and tracked through the assay process by established chain of custody procedure and via audit trails conducted by independent and company specialists.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	The NST database was reviewed internally and no material issues were identified.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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.	All holes mentioned in this report are from the Groundrush deposit located within the ML22934 tenement which is owned by Tanami Gold NL (75%) and Northern Star Resources Limited (25%). There are statutory royalties' payable to the Northern Territory Government and a range of payment obligations under existing agreements with the Central Lands Council.
	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.	No known impediments exist and the tenements are in good standing.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The Groundrush area has been explored since the mid 1980's. Numerous companies, including Zapopan NL, Otter Gold NL, Normandy Mining Ltd, Newmont (Asia Pacific), and Tanami Gold NL have been active in the area. Previous drilling at this project adds gold grade and geological context to the subsequent Northern Star Resources interpretation of the area as tested by the drill holes covered by this report.
Geology	Deposit type, geological setting and style of mineralisation.	The Groundrush deposit is hosted by rocks of the Killi Formation exposed in a narrow N to NNW trending corridor flanked by lobes of the younger Frankenia Dome granite. Groundrush lies within rocks of a similar age to the host rocks of The Granites and Dead Bullock Soak gold deposits 100km to the south, but older than the Mount Charles Formation, which hosts the Tanami gold deposits 50km south west. Less than 1 km to the north of Groundrush, the Killi Killi beds are truncated by a fault bounded outlier of younger sediment of the Mount Charles Formation. At Groundrush, a package of relatively undeformed, steeply west dipping, sedimentary rocks are intruded by two tabular dolerite units which are broadly conformable with bedding. The main dolerite body exposed in the open pit consists of a coarser grained leucocratic quartz dolerite. Gold mineralisation is mainly hosted in quartz-sulphide veins and stockwork zones within steeply dipping shear zones in the quartz dolerite unit as well as flat dipping quartz-sulphide brittle fracture veins.
Drill hole Information	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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar o dip and azimuth of the hole o down hole length and interception depth o hole length.	Exploration results not being reported.
	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.	Exploration results not being reported.

Criteria	JORC Code explanation	Commentary
Data aggregation methods	In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	Exploration results not being reported.
	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.	Mineralised intersections were composited to 1m with smaller intersects distributed throughout intersection. Top cut were used and ranged from10-150gpt depending on the domain.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalent values have been used in this Resource.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results:	Exploration results not being reported.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	The exact orientation of the Groundrush mineralised system is generally well understood. Geometry of the mineralisation to drill hole intercepts generally at a high angle, often nearing perpendicular. There is enough historic exploration and production data at Groundrush to infer geological continuity in mineralisation reported.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	The downhole widths have been clearly specified when used.
Diagrams	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.	Appropriate plans and section have been included in this release.
Balanced reporting	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.	Both high and low grades have been reported accurately, clearly identified with the drill-hole attributes and 'From' and 'To' depths. All intercepts for all holes have been reported regardless of grade.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Bulk density were conducted on every fifth hole throughout the waste and mineralized zones.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	Drilling is continuing in 2016 to determine the extents of the Groundrush system.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Appropriate diagrams accompany this release.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	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.	Logging data is entered directly into the logging package Logchief. Constrained look-up lists, depth and some interval validation are inbuilt and ensure that the data collected is correct at source. Data was exported as .csv and imported into a "restricted access" Access database. Sampling and raw assay files were directly imported into a "restricted access" Access database, with internal validations and QAQC protocols used to check integrity. Pre-NSR data assumed correct but no validation has been undertaken. For all data, the drilling looked reliable visually and no overlapping intervals were noted.
	Data validation procedures used.	NST data validated by internal protocols within the access database and by database administrators. Pre-NSR data has been validated by previous owners and is assumed to be correct. One hole was excluded due to unrepresentative intercept angle.

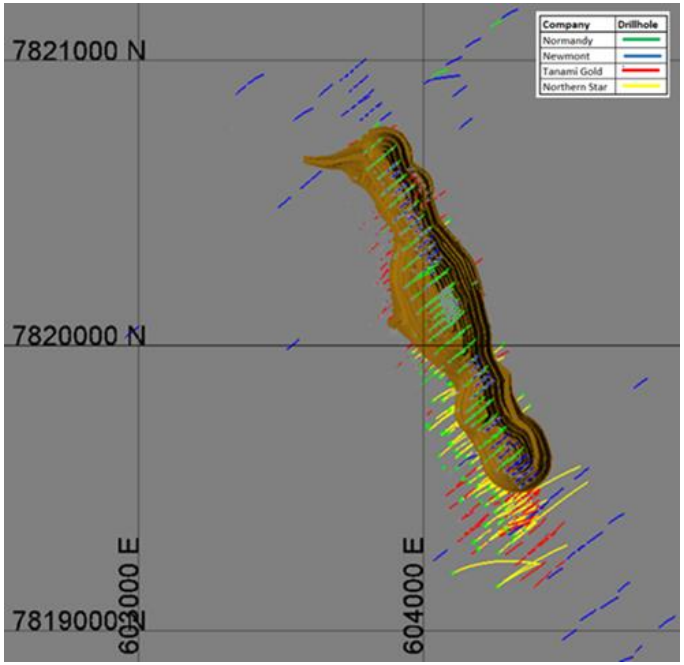
Criteria	JORC Code explanation	Commentary
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	Site visits have been undertaken before and during drilling program by the Competent Person.
	If no site visits have been undertaken indicate why this is the case.	Site visited.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	The interpretation of the deposit was carried out using a systematic approach to ensure continuity of the geology by the supervising and logging geologists. Sectional interpretations were digitized in Vulcan software and triangulated to form three dimensional solids. Confidence in the geological interpretation is moderate to high. Weathering zones and bedrock sub surfaces were also created.
	Nature of the data used and of any assumptions made.	All available valid data was used including drill data, mapping, and previous interpretations. NSR drilled 118 of the 778 holes used in the current Resource. Where pre-NSR drill data was used, it is assumed correct and to industry standards of the time.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	A previous Resource used narrow, high grade interpretations based on the structural data. While those narrow structures do exist, it is evident from the infill grade control, pit mapping and continues drilling that the narrow structures form larger cohesive units. The effect of the broader interpretation approach results in lower grade, higher tonnes and a realistic model to be used for economic studies.
	The use of geology in guiding and controlling Mineral Resource estimation.	Geology is used to constrain the mineralised packages (containing variously orientated quartz veins) within the Groundrush dolerite host.
	The factors affecting continuity both of grade and geology.	Grade continuity is related to mineralised packages extent within Groundrush dolerite host.
Dimensions	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.	Maximum Strike Length = 1,650m with individual zones 50 to 1,100m long; Maximum Width = 80m with zones 2 to 35m thick; Maximum Depth = from surface to ~680m below surface.
Estimation and modelling techniques	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.	Ordinary Kriging (OK) was used to estimate this Resource using Vulcan 9.1 software. Domains are snapped to drilling, and composited to 1m downhole. Small composites were merged throughout intersection. Four statistical domains were used to reflect the different orientations of mineralisation packages. A maximum search range from 18 - 220m (all directions and passes) was used in the mineralised packages.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	The modelling techniques were compared to a Mineral Resource was estimated in 2012 that reported all material greater than 1gpt and previous open pit production records.
	The assumptions made regarding recovery of by-products.	No assumptions of by product recovery are made.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No deleterious elements estimated in the model.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	Block size is 4m x 12m x 4m, sub-celled down to 0.5m x 1.5m x 0.5m to fit estimation domains. Average drill hole spacing is ~ 25-50m. Four search ellipses were used over four passes with a minimum of 15 samples to estimate per block (1st Pass) with a maximum of 32. Subsequent pasts used fewer numbers of samples (8) and maximum search range was increased (3rd Pass). Waste was assigned a valve of 0.005gpt.
	Any assumptions behind modelling of selective mining units.	No assumptions made.
	Any assumptions about correlation between variables.	No assumptions made.
	Description of how the geological interpretation was used to control the Resource estimates.	Mineralisation wireframes are created within the geological shapes based on drill core logs, mapping and grade. Low grades can form part of an ore wireframe.
	Discussion of basis for using or not using grade cutting or capping.	Composite grades were cut to between 10 – 150gpt based on log distribution on individual domains.

Criteria	JORC Code explanation	Commentary
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Block grades were compared visually to drilling data. Validation is also through swath plots comparing composites to block model grades, along northings comparing OK to ID2 to nearest neighbour estimations. All compared favourable.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated with natural moisture. Moisture content within the ore is expected to vary through the oxide to fresh. Minimal voids reported within all rock types. Water table at approximately 60m below surface.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	Reporting cut off = 1.0gpt.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	It is assumed Groundrush will be mined by either open pit and/or underground mining methods, and scoping level evaluations support the economics. Below the economic pit depth, grades are high enough to potentially be mined by underground methods. Assume nearby CTP mill will be refurbished for processing.
Metallurgical factors or assumptions	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.	No metallurgical holes were drilled as a part of the current drilling program. Metallurgical test work from previous owners and previous production data indicate that the mineralisation is free milling with high (90%+) gold recovery using standard CIL processing.
Environmental factors or assumptions	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 green fields 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.	No environmental, permitting, legal, taxation, socio-economic, marketing or other relevant issues are known, that may affect the estimate.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	Bulk densities are based on 845 samples from 20 DD holes. Measurements were taken using the immersion method and related back to dominant rock code. This validated previously reported bulk density measurements and assumptions.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	Bulk density of the host rock and mineralisation is well covered and validates previous bulk density work.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Individual bulk densities are applied to geological units.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	Classification is based on drill spacing and passes used to delineate Inferred and Indicated Mineral Resource.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Confidence in the relative tonnage and grade is moderate to high based on interpretation continuity which will be confirmed by future infill drilling. Pre-NSR data was audited previously and is assumed to be reliable.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The result appropriately reflects the Competent Person(s)' view of the deposit.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Groundrush Mineral Resource has been internally and externally reviewed. A number of recommendations highlighted during the processes were implemented as required.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such	This Groundrush Mineral Resource estimate is considered as robust and representative. The application of geostatistical methods has increased the confidence of the model and quantify the relative accuracy of the Resource on a global scale. It relies on historical data being of similar standard as recent infill drilling. The relevant tonnages and grade are variable on a local scale.

Criteria	JORC Code explanation	Commentary
	an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	
	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.	This Resource report relates to the Groundrush Gold Project where it is likely to have local variability. The global assessment is more of a reflection of the average tonnes and grade estimate.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Historic production from the Groundrush pit has been recorded as 4.2Mt @ 4.5gpt for 611koz. Comparison with current Resource shows similar results (4.4Mt @ 4.2gpt for 600koz @ 0.8gpt cut-off). Certainly, on a global scale this compares favourably.

CENTRAL TANAMI - REPRESENTATIVE PLAN & OBLIQUE VIEW (GROUNDRUSH DEPOSIT)

Plan View – Groundrush deposit



Oblique View - Groundrush deposit with drill hole traces. Wireframes denote major mineralised structures and open pit.