

11 December 2019

## INCREASED RECOVERIES FROM SULPHIDE METALLURGICAL WORK AT KHARMAGTAI

Xanadu Mines Ltd (ASX: XAM, TSX: XAM) (“Xanadu” or “the Company”) is pleased to announce significant improvements in copper and gold recoveries from metallurgical testing from its flagship at Kharmagtai project, which is located in the south Gobi region of Mongolia (Figure 1). The new metallurgical test programme has expanded on that conducted during the 2018 Mineral Resource Estimate (see Xanadu’s ASX/TSX announcement dated 31 October 2018) and 2019 Scoping Study (see Xanadu’s ASX/TSX announcement dated 11 April 2019) and has produced substantial improvements in copper and gold recovery and in copper concentrate copper and gold grades.

### HIGHLIGHTS

- Metallurgical test work yields high grade copper and gold concentrate at Kharmagtai
- Improved metallurgical recoveries indicate a major value uplift for Kharmagtai
- An estimated 4.5% increase in copper recovery to achieve an average recovery of 89.5% for the two main metallurgical composites
- An estimated 3% increase in gold recovery to achieve an average recovery of 69.7% for the two main metallurgical composites
- Concentrate grades averaged 25.2% Cu and 25.8g/t Au for the two locked cycle tests
- Further optimisation work may lead to further improvements

**Xanadu’s Managing Director & Chief Executive Officer, Dr Andrew Stewart, said** “We are extremely pleased with these new metallurgical results from Kharmagtai, which are in line with or better than expected at this stage in the projects life and we are comfortable that additional improvements can be made further down the track. These early stage flotation test results are very encouraging and indicate that a standard crushing, grinding and flotation process will be enough to deliver good extraction of the economic minerals from the deposit. In combination with the low content of deleterious elements, we foresee no significant hurdles to producing a high-quality concentrate via standard processing pathways that will be in high demand from all the major global copper smelters, at a time the time of production.”

### UPDATED METALLURGICAL TESTS FOR KHARMAGTAI

Additional metallurgical testing has been completed on the Kharmagtai Project. This work was conducted at SGS Canada in Vancouver, BC (“SGS”) under the direction of David Middleditch and Andy Holloway of AGP Mining Consultants Inc. (“AGP”). New composites, three domain and nine variability were selected by Xanadu geologists with input from AGP personnel to represent the main geological and alteration domains within the open pit portion of the three existing deposits and to be representative of material in the 2018 Mineral Resource Estimate.

Copper and gold recoveries average 89.5% and 69.7% respectively for the two main master composites, ranging from 89.3% to 89.7% for copper and 60.8% to 78.7% for gold. Copper concentrates graded at an average of 25.2% Cu and 26.5g/t Au and ranged from 24.8 to 25.6% Cu and 21.5 to 30.0g/t Au.

## 2019 METALLURGICAL TESTWORK DESIGN AND RESULTS

The 2019 metallurgical test program was designed to improve upon metallurgical assumptions in the 2018 Mineral Resource Estimate (see Xanadu's ASX/TSX announcement dated 31 October 2018) and 2019 Scoping Study (see Xanadu's ASX/TSX announcement dated 11 April 2019). Three domain composites and nine variability composites were selected to represent the main geometallurgical domains within the open pits designed during the 2018 Mineral Resource Estimate.

Each composite was run using the same base parameters as the 2008 metallurgical tests as a starting point. Selected composites were then optimised for the effect of primary grind and changes to cleaner parameters, flotation times and additive dosages. Locked cycle test characteristics for the two major alteration domains (Albite and Chlorite-Sericite) which represent around 80% of the mill feed from the 2018 MRE and 2019 Scoping Study can be found in **Table 1**.

**Table 1:** Locked cycle test results for the two main master composites at Kharmagtai

Test	Products	Wt. %	Assays, g/t, %				Distribution, %			
			Cu	Fe	Au	S	Cu	Fe	Au	S
<b>Alb MC-LCT1</b>	<b>3rd Cleaner Con</b>	<b>1.0</b>	<b>25.57</b>	<b>31.60</b>	<b>30.04</b>	<b>35.80</b>	<b>89.7</b>	<b>5.4</b>	<b>78.7</b>	<b>41.2</b>
	1st Cleaner Tailing	20.2	0.03	7.36	0.13	2.25	2.1	24.9	7.0	51.9
	Rougher Tailing	78.8	0.03	5.28	0.07	0.08	8.2	69.7	14.3	6.9
	Feed		0.29	5.97	0.39	0.88				
<b>Ser_ChI MC-LCT1</b>	<b>3rd Cleaner Con</b>	<b>1.2</b>	<b>24.77</b>	<b>21.50</b>	<b>21.49</b>	<b>34.96</b>	<b>89.3</b>	<b>5.0</b>	<b>60.8</b>	<b>14.1</b>
	1st Cleaner Tailing	21.8	0.06	14.47	0.55	11.51	3.9	41.6	27.9	83.4
	Rougher Tailing	77.0	0.03	5.25	0.06	0.10	6.9	53.4	11.4	2.5
	Feed		0.34	7.58	0.43	3.00				
<b>Average</b>	<b>3rd Cleaner Con</b>	<b>1.1</b>	<b>25.2</b>	<b>26.5</b>	<b>25.8</b>	<b>35.4</b>	<b>89.5</b>	<b>5.2</b>	<b>69.7</b>	<b>27.7</b>

2019 samples were selected from all three deposits with variability domains within each deposit defined by a geometallurgical model developed to represent the key rock type and alteration types (**Table 2 and 3**).

Flotation test work on these composites consisted of a series of batch rougher and cleaner tests with locked cycle tests conducted on the two main Master Composites, Ser\_ChI and Alb. The locked cycle cleaner test flowsheet is given in **Figure 2** and performance curves for copper and gold are displayed in **Figure 3** and **Figure 4**.

The key differences between the 2008 test work and the 2019 test work relate to head grade and sample selection. The 2008 tests were conducted on samples with copper and gold grades not representative of the bulk of the open pit mineralisation. Samples selected for the 2008 test work were not selected based on metallurgical or geological domains. In contrast, samples within the 2019 test program were selected based on a geometallurgical model developed by CSA Global, which represents different rock and alteration types throughout the three deposits. These rock and alteration types will represent the largest variability in metallurgical responses and selecting composites based on these give a much more robust dataset for metallurgical performance.

**Table 2: 2019 metallurgical sample descriptions**

Comp #	Deposit	GeoMet	Weight Kg	Description	Type	Notes
1	White Hill	Potassic_dio	36.8	minor contribution (<10%) in early years of mining	VARI	Potassic – Diorite: (or other intrusions) at depth below the starter pit at White Hill
2		Potassic_slt	38.35	minor contribution (<10%) in early years of mining	VARI	Potassic – Siltstone: at depth below the starter pit at White Hill
3		Ser_chl	49.45	represents 40% of sulphide tonnage in early years of mining	VARI	Sericite-Chlorite +/- carbonate, calcite, minor albite. This material should be noticeably softer (lower BWI) than all other material types, but may prove to have some more problematic mineralogy from a flotation perspective (more chlorite, sericite and possibly some minor hydrothermal clays)
4		Alb	53.15	represents 40% of sulphide tonnage in early years of mining	VARI	Albite dominant Sodic altered material, which is likely to be hard (high BWI) but not terribly abrasive, and should not cause too many problems in the float circuit apart from a weak chlorite/sericite overprint
5	Copper Hill	Ser_chl	34.35	represents 45% of sulphide tonnage in early years	VARI	Sericite-Chlorite +/- carbonate, calcite, minor albite. This material should be noticeably softer (lower BWI) than all other material types, but may prove to have some more problematic mineralogy from a flotation perspective (more chlorite, sericite and possibly some minor hydrothermal clays)
6		Alb	38.3	represents 45% of sulphide tonnage in early years	VARI	Albite dominant Sodic altered material, which is likely to be hard (high BWI) but not terribly abrasive, and should not cause too many problems in the float circuit apart from a weak chlorite/sericite overprint
7		Ser_chl	51.3	represents 40% of sulphide tonnage in early years	VARI	Sericite-Chlorite +/- carbonate, calcite, minor albite. This material should be noticeably softer (lower BWI) than all other material types, but may prove to have some more problematic mineralogy from a flotation perspective (more chlorite, sericite and possibly some minor hydrothermal clays)
8		Alb	39.95	represents 40% of sulphide tonnage in early years	VARI	Albite dominant Sodic altered material, which is likely to be hard (high BWI) but not terribly abrasive, and should not cause too many problems in the float circuit apart from a weak chlorite/sericite overprint
9		TBX	49.3	<10% of sulphide tonnage in early years	MASTER	Tourmaline Breccia - this will be tested as a Master composite, so needs Bwi
10	Master Comp	Alb	51	17-kg from #4, 17-kg from #6, 17-kg from #8	MASTER	Blend of albite units from the 3 deposits
11		Ser_chl	51	17-kg from #3, 17-kg from #5, 17-kg from #7	MASTER	Blend of Sericite/Chlorite units from the 3 deposits

**Table 3: 2019 metallurgical composite head grade analysis**

Comp	Cu (%)	Fe (%)	S (%)	Au (g/t)
Comp 1	0.31	6.1	3.02	0.16
Comp 2	0.31	3.7	1.42	0.12
Comp 3	0.32	7.04	2.41	0.33
Comp 4	0.24	5.22	0.93	0.18
Comp 5	0.45	7.06	2.85	0.40
Comp 6	0.36	6.35	0.86	0.60
Comp 7	0.28	8.07	3.86	0.57
Comp 8	0.28	5.98	0.97	0.50
Comp 9 (TBX Master)	0.27	7.37	2.27	0.50
ALB Master Comp	0.29	5.89	0.93	0.42
SER CHL Master Comp	0.35	7.44	3.03	0.42
<b>Average</b>	<b>0.31</b>	<b>6.47</b>	<b>2.07</b>	<b>0.39</b>
Max.	0.45	8.07	3.86	0.60
Min.	0.24	3.70	0.86	0.12

## PREVIOUS METALLURGICAL WORK AT KHARMAGTAI

In 2008, Ivanhoe Mines Ltd completed a series of sulphide floatation metallurgical test on Kharmagtai. For additional information on these tests please see ASX announcement dated 11 April 2019 and the NI43-101 technical report filed on SEDAR in October 2018.

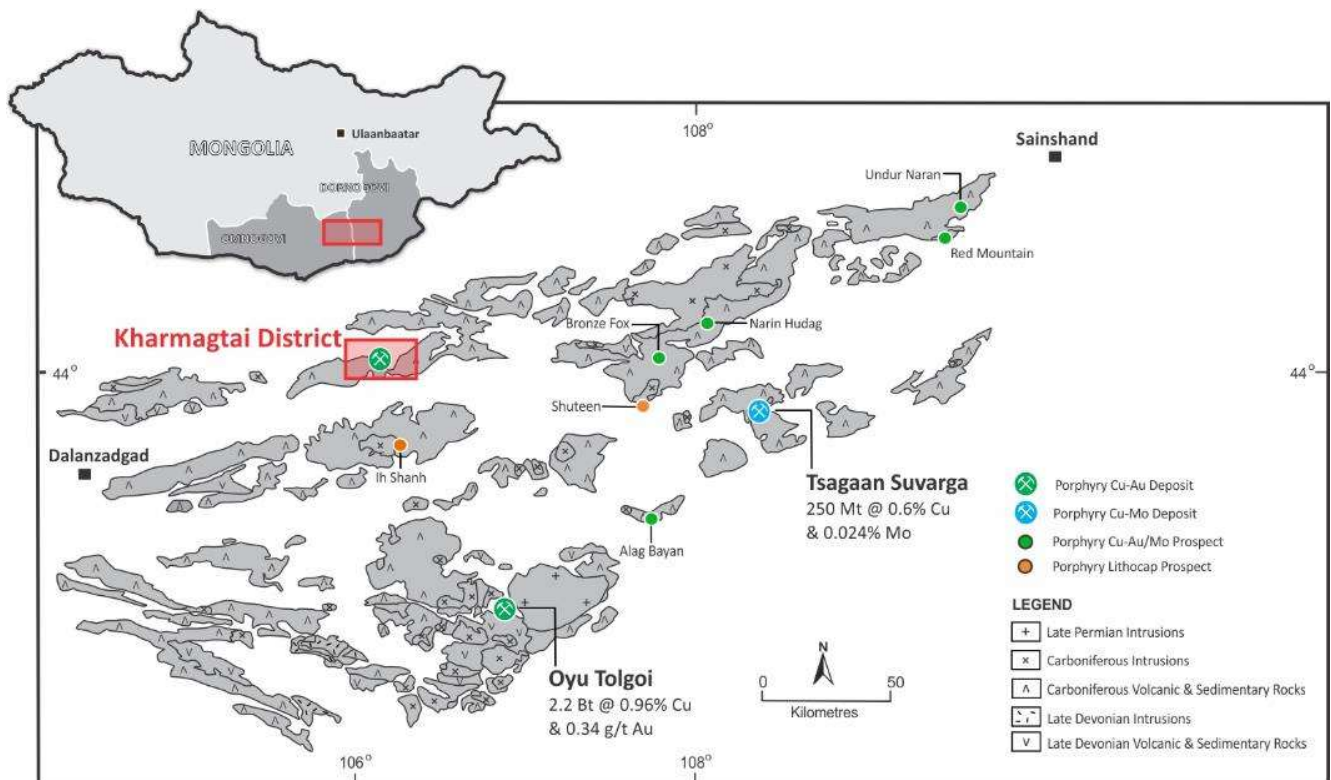
These were opportunistic and tied in with metallurgical testing for the Oyu Tolgoi deposit. Samples selected from Kharmagtai were from five drill holes within the three main deposits. Sample selection focused on the higher-grade material rather than a representative sample based on geological or geometallurgical domains.

In summary, a program of preliminary metallurgical testwork was completed by G&T Metallurgical Services (Kamloops, Canada) on a batch of nine composite samples from Mongolia. The samples were reported at that time to have originated from an untested region of the Oyu Tolgoi deposit; however, Xanadu can confirm that five of the nine composite samples did in fact originate from the region now described as Kharmagtai.

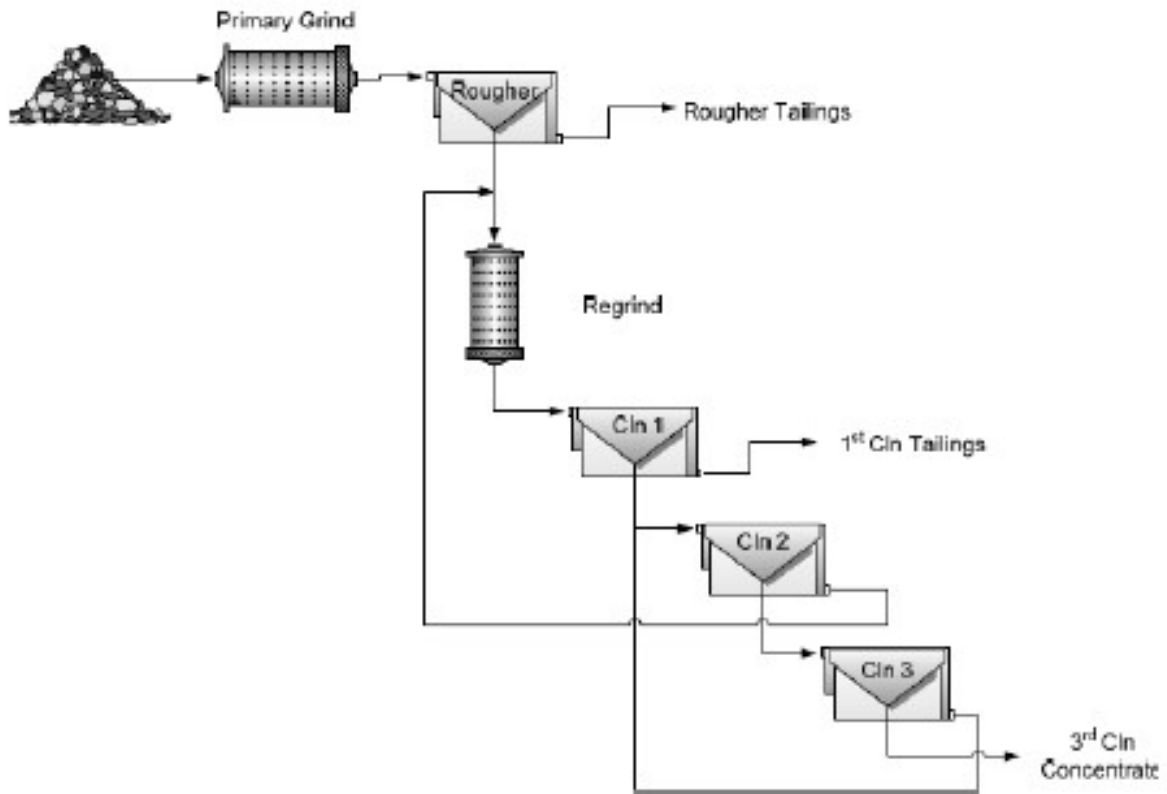
Flotation testwork on these samples consisted of a series of batch rougher and cleaner tests. No locked cycle testing was completed.

In this work, Aerophine 3418A was used as a selective copper sulphide collector and MIBC (Methyl Iso Butyl Carbinol) was used as a flotation frother. Pulp pH was adjusted in the cleaner circuit using lime to increase pH to a point where only moderate pyrite flotation would be expected. Insufficient work was conducted in this preliminary program to fully optimise flotation conditions.

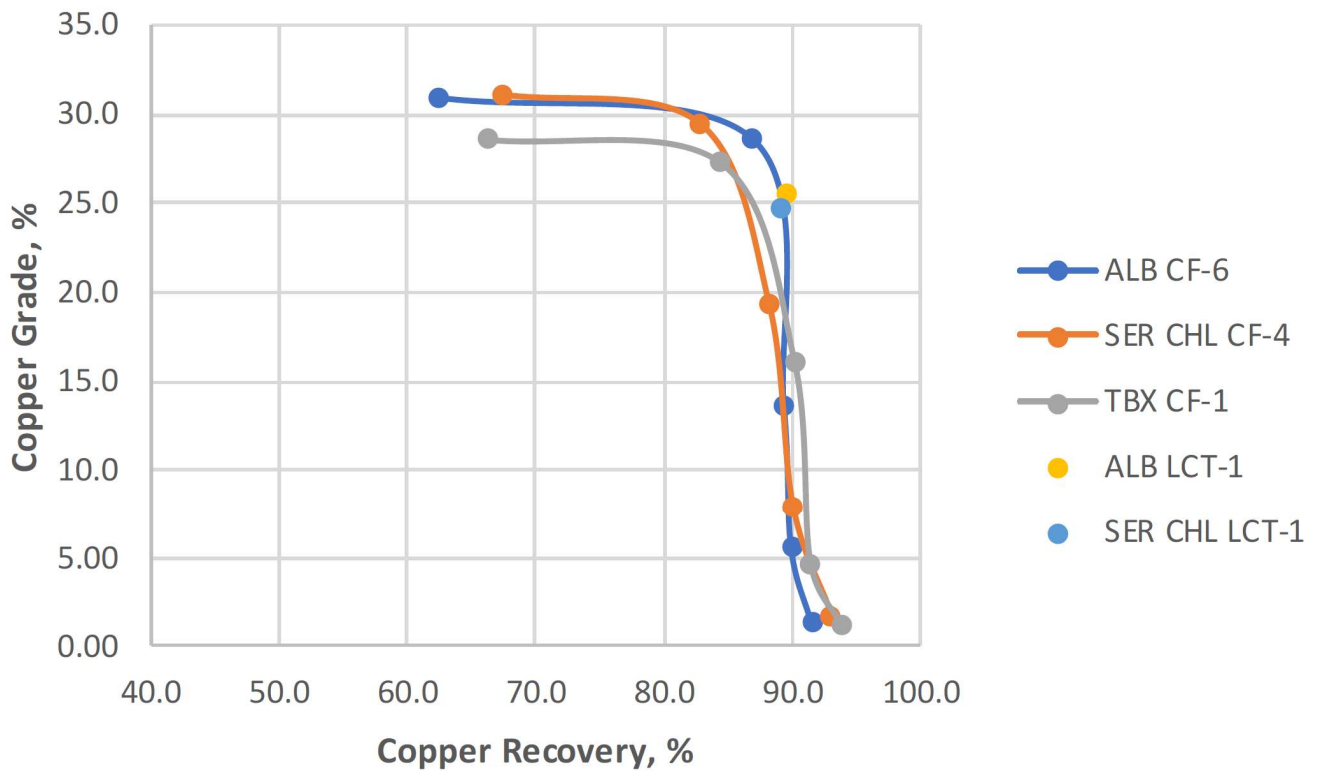
Saleable copper concentrates were achieved for all composites with average contents of approximately 30% copper. At these concentrate levels, the recovery of copper ranged between 75% and 90%, although AT 003 achieved only 30% recovery due to the elevated levels of oxide copper mineralisation measured in this composite.



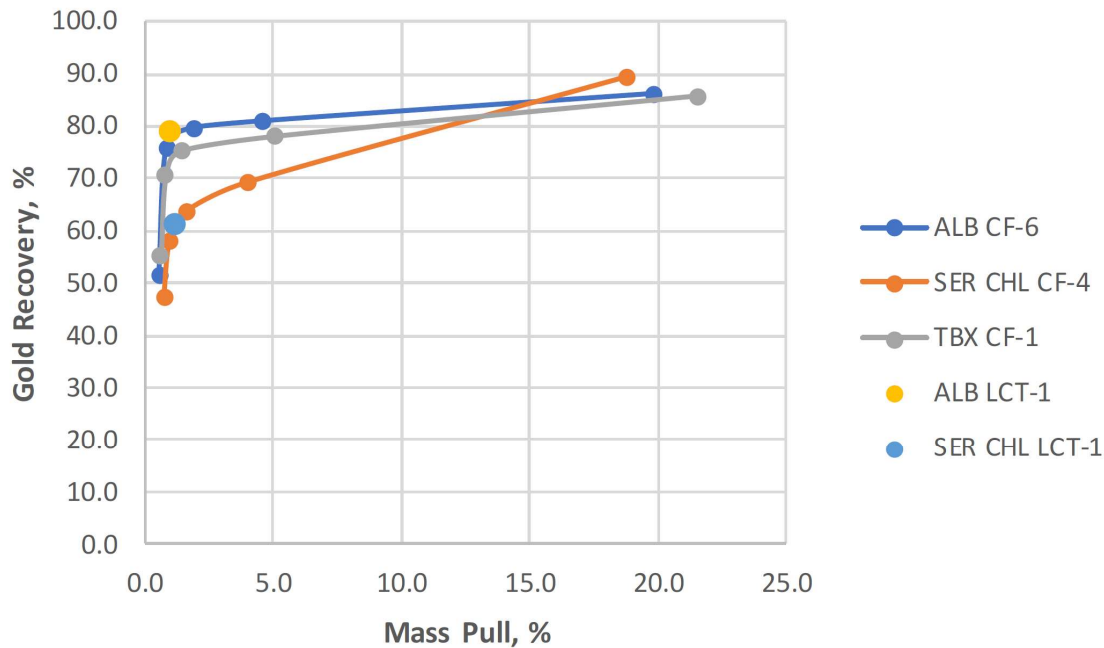
**FIGURE 1:** Location of the Kharmagtai Project in the South Gobi porphyry copper belt.



**FIGURE 2:** 2019 Locked cycle test flow sheet.



**FIGURE 3:** 2019 Test work optimised copper recovery grade curves for master composites ALB, SER\_CHL and TBX.



**FIGURE 4:** 2019 Test work optimised gold recovery grade curves for master composites ALB, SER\_CHL and TBX.

### COMPETENT-QUALIFIED PERSON STATEMENT

The information in this announcement that relates to metallurgical test work is based on a summary of results compiled by Andrew Holloway who is responsible for metallurgical and process engineering aspects of the project. Mr. Holloway, who is a principal of AGP Mining Consultants Inc. (Toronto, Canada) and is a Professional Engineer in Ontario, Canada, has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as the “Competent Person” as defined in the 2012 Edition of the “Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves” and the National Instrument 43-101. Mr Holloway consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

The information in this announcement that relates to exploration results is based on information compiled by Dr Andrew Stewart who is responsible for the exploration data, comments on exploration target sizes, QA/QC and geological interpretation and information. Dr Stewart, who is an employee of Xanadu and is a Member of the Australian Institute of Geoscientists, has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as the “Competent Person” as defined in the 2012 Edition of the “Australian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves” and the National Instrument 43-101. Dr Stewart consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.

**For further information, please contact:**

Andrew Stewart  
 Chief Executive Officer  
 T: +61 2 8280 7497  
 M: +61 409 819 922  
[Andrew.stewart@xanadumines.com](mailto:Andrew.stewart@xanadumines.com)  
[www.xanadumines.com](http://www.xanadumines.com)



## APPENDIX 1: KHARMAGTAI TABLE 1 (JORC 2012)

### 1.1 JORC TABLE 1 – SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

Set out below is Section 1 and Section 2 of Table 1 under the JORC Code, 2012 Edition for the Kharmagtai project. Data provided by Xanadu. This Table 1 updates the JORC Table 1 disclosure dated 28 November 2019.

### 1.2 JORC TABLE 1 - SECTION 1 - SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li><i>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i></li> <li><i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i></li> <li><i>Aspects of the determination of mineralisation that are Material to the Public Report.</i></li> <li><i>In cases where ‘industry standard’ work has been done this would be relatively simple (e.g. ‘reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay’). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.</i></li> </ul>	<ul style="list-style-type: none"> <li>Metallurgical Samples – As described in the body of the above announcement metallurgical work was conducted on domain and nine variability composites selected from the three main deposits (Stockwork Hill, White Hill and Copper Hill). Samples were selected using a geometallurgical domain model developed via 3D analysis of ASD spectral data and four acid digest multi-element assay data. Table two in the body of the announcement provides a detailed description of these samples including ore type, weights of samples, percentages of the projected mill feed for the open pit mines and detailed notes on the criteria which separates the various ore types. Samples consisted of ½ HQ core. Samples were transported to SGS laboratories in Canada within securely sealed plastic drums via air courier (DHL).</li> <li>Metallurgical samples were selected with the aim to satisfy the following conditions             <ul style="list-style-type: none"> <li>Ore that would be mined within the proposed open pits</li> <li>Reflect the main ore type variability domains within the proposed open pits</li> <li>Represent grade profiles across the proposed open pits</li> </ul> </li> <li>The resource estimate is based on diamond drill core samples, RC chip samples and channel samples from surface trenches.</li> <li>Representative ½ core samples were split from PQ, HQ &amp; NQ diameter diamond drill core on site using rock saws, on a routine 2m sample interval that also honors lithological/intrusive contacts.</li> <li>The orientation of the cut line is controlled using the core orientation line ensuring uniformity of core splitting wherever the core has been successfully oriented.</li> <li>Sample intervals are defined and subsequently checked by geologists, and sample tags are attached (stapled) to the plastic core trays for</li> </ul>

Criteria	JORC Code explanation	Commentary
		<p>every sample interval.</p> <ul style="list-style-type: none"> <li>• RC chip samples are ¼ splits from one meter intervals using a 75%:25% riffle splitter to obtain a 3kg sample</li> <li>• RC samples are uniform 2m samples formed from the combination of two ¼ split 1m samples.</li> </ul>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li>• <i>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).</i></li> </ul>	<ul style="list-style-type: none"> <li>• The Mineral Resource estimation has been based upon diamond drilling of PQ, HQ and NQ diameters with both standard and triple tube core recovery configurations, RC drilling and surface trenching with channel sampling.</li> <li>• All drill core drilled by Xanadu has been oriented using the “Reflex Ace” tool.</li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>• <i>Method of recording and assessing core and chip sample recoveries and results assessed.</i></li> <li>• <i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i></li> <li>• <i>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Diamond drill core recoveries were assessed using the standard industry (best) practice which involves: removing the core from core trays; reassembling multiple core runs in a v-rail; measuring core lengths with a tape measure, assessing recovery against core block depth measurements and recording any measured core loss for each core run.</li> <li>• Diamond core recoveries average 97% through mineralization.</li> <li>• Overall, core quality is good, with minimal core loss. Where there is localized faulting and or fracturing core recoveries decrease, however, this is a very small percentage of the mineralized intersections.</li> <li>• RC recoveries are measured using whole weight of each 1m intercept measured before splitting</li> <li>• Analysis of recovery results vs grade shows no significant trends that might indicate sampling bias introduced by variable recovery in fault/fracture zones.</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>• <i>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</i></li> <li>• <i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i></li> <li>• <i>The total length and percentage of the relevant intersections logged.</i></li> </ul>	<ul style="list-style-type: none"> <li>• All drill core is geologically logged by well-trained geologists using a modified “Anaconda-style” logging system methodology. The Anaconda method of logging and mapping is specifically designed for porphyry Cu-Au mineral systems and is entirely appropriate to support Mineral Resource Estimation, mining and metallurgical studies.</li> <li>• Logging of lithology, alteration and mineralogy is intrinsically qualitative in nature. However, the logging is subsequently supported by 4 Acid ICP-MS (48 element) geochemistry and</li> </ul>



Criteria	JORC Code explanation	Commentary
		<p>SWIR spectral mineralogy (facilitating semi-quantitative/calculated mineralogical, lithological and alteration classification) which is integrated with the logging to improve cross section interpretation and 3D geological model development.</p> <ul style="list-style-type: none"> <li>• Drill core is also systematically logged for both geotechnical features and geological structures. Where drill core has been successfully oriented, the orientation of structures and geotechnical features are also routinely measured.</li> <li>• Both wet and dry core photos are taken after core has been logged and marked-up but before drill core has been cut.</li> </ul>
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li>• <i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></li> <li>• <i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></li> <li>• <i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></li> <li>• <i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i></li> <li>• <i>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</i></li> <li>• <i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></li> </ul>	<ul style="list-style-type: none"> <li>• All drill core samples are ½ core splits from either PQ, HQ or NQ diameter cores. A routine 2m sample interval is used, but this is varied locally to honour lithological/intrusive contacts. The minimum allowed sample length is 30cm.</li> <li>• Core is appropriately split (onsite) using diamond core saws with the cut line routinely located relative to the core orientation line (where present) to provide consistency of sample split selection.</li> <li>• The diamond saws are regularly flushed with water to minimize potential contamination.</li> <li>• A field duplicate ¼ core sample is collected every 30<sup>th</sup> sample to ensure the “representivity of the in situ material collected”. The performance of these field duplicates are routinely analysed as part of Xanadu’s sample QC process.</li> <li>• Routine sample preparation and analyses of DDH samples were carried out by ALS Mongolia LLC (ALS Mongolia), who operates an independent sample preparation and analytical laboratory in Ulaanbaatar.</li> <li>• All samples were prepared to meet standard quality control procedures as follows: Crushed to 75% passing 2mm, split to 1kg, pulverised to 85% passing 200 mesh (75 microns) and split to 150g sample pulp.</li> <li>• ALS Mongolia Geochemistry labs quality management system is certified to ISO 9001:2008.</li> <li>• The sample support (sub-sample mass and comminution) is appropriate for the grainsize and Cu-Au distribution of the porphyry Cu-Au mineralization and associated host rocks.</li> </ul>

Criteria	JORC Code explanation	Commentary
		<ul style="list-style-type: none"> <li>• Metallurgical samples - 90 individual samples were shipped to SGS in Vancouver.               <ul style="list-style-type: none"> <li>○ Total weight of 392kg</li> <li>○ Each sample was characterized and blended in to 9 composite samples</li> <li>○ Mass range for samples was 34kg to 53kg</li> <li>○ Each met composite was formed, stage crushed to -6 mesh and 8kg was riffled to be further crushed to -10 mesh</li> <li>○ Minus 10 mesh material was blended well and rotary split to create 4 x 2 kg test charges</li> <li>○ Test charges were stored in a freezer</li> <li>○ Three Master composites were generated form the remaining -6 mesh material</li> <li>○ A 10kg charge was riffled out for BWI testing</li> <li>○ The remaining Master composite material was stage crushed to -10 mesh and riffled split into as many 2kg test charges as possible</li> </ul> </li> </ul>
<b>Quality of assay data and laboratory tests</b>	<ul style="list-style-type: none"> <li>• <i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></li> <li>• <i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i></li> <li>• <i>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Metallurgical tests were conducted by SGS in Vancouver, BC, Canada.               <ul style="list-style-type: none"> <li>○ Each variability and master composite was sub-sampled and underwent head chemical analysis for Cu, Fe, S and Au (in triplicate), Ag, S-total and a multielement ICP scan.</li> <li>○ Bond Ball Mill Grindability tests were conducted as per the original Bond procedure</li> <li>○ QEMSCAN was conducted on each variability sample</li> <li>○ Grind calibrations were conducted on each variability and master composite to determine the grind time-particle size relationships.</li> <li>○ Variability rougher floatation tests were conducted on the variability samples based on previous test parameters.</li> <li>○ Cleaner variability and optimized</li> </ul> </li> </ul>

Criteria	JORC Code explanation	Commentary
		<p>variability cleaner tests were conducted on the variability metallurgical samples</p> <ul style="list-style-type: none"> <li>○ Optimization floatation testing was conducted on Master Composites.</li> <li>○ Master Composite locked cycle testing was conducted.</li> </ul> <ul style="list-style-type: none"> <li>• All samples were routinely assayed by ALS Mongolia for gold</li> <li>• Au is determined using a 25g fire assay fusion, cupelled to obtain a bead, and digested with Aqua Regia, followed by an atomic absorption spectroscopy (AAS) finish, with a lower detection (LDL) of 0.01 ppm.</li> <li>• All samples were also submitted to ALS Mongolia for the 48 element package ME-ICP61 using a four acid digest (considered to be an effective total digest for the elements relevant to the MRE). Where copper is over-range (&gt;1% Cu), it is analysed by a second analytical technique (Cu-OG62), which has a higher upper detection limit (UDL) of 5% copper.</li> <li>• Quality assurance has been managed by insertion of appropriate Standards (1:30 samples – suitable Ore Research Pty Ltd certified standards), Blanks (1:30 samples), Duplicates (1:30 samples – ¼ core duplicate) by XAM.</li> <li>• Assay results outside the optimal range for methods were re-analysed by appropriate methods.</li> <li>• Ore Research Pty Ltd certified copper and gold standards have been implemented as a part of QC procedures, as well as coarse and pulp blanks, and certified matrix matched copper-gold standards.</li> <li>• QC monitoring is an active and ongoing processes on batch by batch basis by which unacceptable results are re-assayed as soon as practicable.</li> <li>• Prior to 2014: Cu, Ag, Pb, Zn, As and Mo were routinely determined using a three-acid-digestion of a 0.3g sub-sample followed by an AAS finish (AAS21R) at SGS Mongolia. Samples were digested with nitric, hydrochloric and perchloric acids to dryness before leaching with hydrochloric acid to dissolve soluble salts and made to 15ml volume with distilled water. The LDL for copper using this</li> </ul>

Criteria	JORC Code explanation	Commentary
		<p>technique was 2ppm. Where copper was over-range (&gt;1% Cu), it was analysed by a second analytical technique (AAS22S), which has a higher upper detection limit (UDL) of 5% copper. Gold analysis method was essentially unchanged.</p>
<b>Verification of sampling and assaying</b>	<ul style="list-style-type: none"> <li>• <i>The verification of significant intersections by either independent or alternative company personnel.</i></li> <li>• <i>The use of twinned holes.</i></li> <li>• <i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></li> <li>• <i>Discuss any adjustment to assay data.</i></li> </ul>	<ul style="list-style-type: none"> <li>• All assay data QAQC is checked prior to loading into XAM's Geobank data base.</li> <li>• The data is managed by XAM geologists.</li> <li>• The data base and geological interpretation is managed by XAM.</li> <li>• Check assays are submitted to an umpire lab (SGS Mongolia) for duplicate analysis.</li> <li>• No twinned drill holes exist.</li> <li>• There have been no adjustments to any of the assay data.</li> </ul>
<b>Location of data points</b>	<ul style="list-style-type: none"> <li>• <i>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i></li> <li>• <i>Specification of the grid system used.</i></li> <li>• <i>Quality and adequacy of topographic control.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Diamond drill holes have been surveyed with a differential global positioning system (DGPS) to within 10cm accuracy.</li> <li>• The grid system used for the project is UTM WGS-84 Zone 48N</li> <li>• Historically, Eastman Kodak and Flexit electronic multi-shot downhole survey tools have been used at Kharmagtai to collect down hole azimuth and inclination information for the majority of the diamond drill holes. Single shots were typically taken every 30m to 50m during the drilling process, and a multi-shot survey with readings every 3-5m are conducted at the completion of the drill hole. As these tools rely on the earth's magnetic field to measure azimuth, there is some localised interference/inaccuracy introduced by the presence of magnetite in some parts of the Kharmagtai mineral system. The extent of this interference cannot be quantified on a reading-by-reading basis.</li> <li>• More recently (since September 2017), a north-seeking gyro has been employed by the drilling crews on site (rented and operated by the drilling contractor), providing accurate downhole orientation measurements unaffected by magnetic effects. Xanadu have a permanent calibration station setup for the gyro tool, which is routinely calibrated every 2 weeks (calibration records are maintained and were sighted)</li> <li>• The project DTM is based on 1 m contours from satellite imagery with an accuracy of <math>\pm 0.1</math></li> </ul>

Criteria	JORC Code explanation	Commentary
		m.
<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>• <i>Data spacing for reporting of Exploration Results.</i></li> <li>• <i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</i></li> <li>• <i>Whether sample compositing has been applied.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Holes spacings range from &lt;50m spacings within the core of mineralization to +500m spacings for exploration drilling. Hole spacings can be determined using the sections and drill plans provided.</li> <li>• Holes range from vertical to an inclination of - 60 degrees depending on the attitude of the target and the drilling method.</li> <li>• The data spacing and distribution is sufficient to establish anomalism and targeting for porphyry Cu-Au, tourmaline breccia and epithermal target types.</li> <li>• Holes have been drilled to a maximum of 1,300m vertical depth.</li> <li>• The data spacing and distribution is sufficient to establish geological and grade continuity, and to support the Mineral Resource classification.</li> </ul>
<b>Orientation of data in relation to geological structure</b>	<ul style="list-style-type: none"> <li>• <i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i></li> <li>• <i>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Drilling is conducted in a predominantly regular grid to allow unbiased interpretation and targeting.</li> <li>• Scissor drilling, as well as some vertical and oblique drilling, has been used in key mineralised zones to achieve unbiased sampling of interpreted structures and mineralised zones, and in particular to assist in constraining the geometry of the mineralised hydrothermal tourmaline-sulphide breccia domains.</li> </ul>
<b>Sample security</b>	<ul style="list-style-type: none"> <li>• <i>The measures taken to ensure sample security.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Samples are delivered from the drill rig to the core shed twice daily and are never left unattended at the rig.</li> <li>• Samples are dispatched from site in locked boxes transported on XAM company vehicles to ALS lab in Ulaanbaatar.</li> <li>• Sample shipment receipt is signed off at the Laboratory with additional email confirmation of receipt.</li> <li>• Samples are then stored at the lab and returned to a locked storage site.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>• <i>The results of any audits or reviews of sampling techniques and data.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Internal audits of sampling techniques and data management are undertaken on a regular basis, to ensure industry best practice is employed at all times.</li> <li>• External reviews and audits have been conducted by the following groups:</li> <li>• 2012: AMC Consultants Pty Ltd. was engaged</li> </ul>

Criteria	JORC Code explanation	Commentary
		<p>to conduct an Independent Technical Report which reviewed drilling and sampling procedures. It was concluded that sampling and data record was to an appropriate standard.</p> <ul style="list-style-type: none"> <li>• 2013: Mining Associates Ltd. was engaged to conduct an Independent Technical Report to review drilling, sampling techniques and QAQC. Methods were found to conform to international best practice.</li> <li>• 2018: CSA Global reviewed the entire drilling, logging, sampling, sample shipping and laboratory processes during the competent persons site visit for the 2018 MRe, and found the systems and adherence to protocols to be to an appropriate standard.</li> </ul>

### 1.3 JORC TABLE 1 - SECTION 2 - REPORTING OF EXPLORATION RESULTS

Criteria	JORC Code explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>• <i>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</i></li> <li>• <i>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The Project comprises 1 Mining Licence (MV-17387A).</li> <li>• The Kharmagtai mining license MV-17387A is 100% owned by Oyut Ulaan LLC. Xanadu has an 85% interest in Mongol Metals LLC, which has 90% interest in Oyut Ulaan LLC. The remaining 10% in Oyut Ulaan LLC is owned by Quincunx (BVI) Ltd (“Quincunx”).</li> <li>• The Mongolian Minerals Law (2006) and Mongolian Land Law (2002) govern exploration, mining and land use rights for the project.</li> </ul>
<b>Exploration done by other parties</b>	<ul style="list-style-type: none"> <li>• <i>Acknowledgment and appraisal of exploration by other parties.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Detailed exploration was conducted by Quincunx Ltd, Ivanhoe Mines Ltd and Turquoise Hill Resources Ltd including extensive surface mapping, trenching, diamond drilling, surface geochemistry and geophysics.</li> </ul>
<b>Geology</b>	<ul style="list-style-type: none"> <li>• <i>Deposit type, geological setting and style of mineralisation.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The mineralisation is characterised as porphyry copper-gold type.</li> <li>• Porphyry copper-gold deposits are formed from magmatic hydrothermal fluids typically associated with felsic intrusive stocks that have deposited metals as sulphides both within the intrusive and the intruded host rocks. Quartz stockwork veining is typically associated with sulphides occurring both within the quartz veinlets and disseminated throughout the wall rock. Porphyry deposits</li> </ul>



Criteria	JORC Code explanation	Commentary																																				
		are typically large tonnage deposits ranging from low to high grade and are generally mined by large scale open pit or underground bulk mining methods. The prospects at Kharmagtai are atypical in that they are associated with intermediate intrusions of diorite to quartz diorite composition; however the deposits are significant in terms of gold:copper ratio, and similar to other gold-rich porphyry deposits.																																				
<b>Drill hole Information</b>	<ul style="list-style-type: none"> <li>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:               <ul style="list-style-type: none"> <li>easting and northing of the drill hole collar</li> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>dip and azimuth of the hole</li> <li>down hole length and interception depth</li> <li>hole length.</li> </ul> </li> <li>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>Diamond holes, RC holes and trenches are the principal source of geological and grade data for the Project.</li> </ul> <table border="1"> <thead> <tr> <th>Timing</th> <th>RC Holes</th> <th>Metre</th> <th>DDH Holes</th> <th>Metre</th> <th>RC &amp; DDH</th> <th>Metre</th> <th>Trench</th> <th>Metre</th> </tr> </thead> <tbody> <tr> <td>Drilling &lt;2015</td> <td>155</td> <td>24553</td> <td>252</td> <td>88511</td> <td>0</td> <td>0</td> <td>106</td> <td>39774</td> </tr> <tr> <td>Drilling &gt;2015</td> <td>68</td> <td>13107</td> <td>116</td> <td>57876</td> <td>22</td> <td>5323</td> <td>17</td> <td>5618</td> </tr> <tr> <td>Total</td> <td>223</td> <td>37660</td> <td>368</td> <td>146387</td> <td>22</td> <td>5323</td> <td>123</td> <td>45392</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>See figures in main report.</li> </ul>	Timing	RC Holes	Metre	DDH Holes	Metre	RC & DDH	Metre	Trench	Metre	Drilling <2015	155	24553	252	88511	0	0	106	39774	Drilling >2015	68	13107	116	57876	22	5323	17	5618	Total	223	37660	368	146387	22	5323	123	45392
Timing	RC Holes	Metre	DDH Holes	Metre	RC & DDH	Metre	Trench	Metre																														
Drilling <2015	155	24553	252	88511	0	0	106	39774																														
Drilling >2015	68	13107	116	57876	22	5323	17	5618																														
Total	223	37660	368	146387	22	5323	123	45392																														
<b>Data aggregation methods</b>	<ul style="list-style-type: none"> <li>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</li> <li>The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	<ul style="list-style-type: none"> <li>Weighted averages have not been used in this work</li> <li>Some compositing has been used in this resource but with statistically relevant techniques that do not include internal dilution</li> </ul> <p>The copper equivalent (eCu) calculation represents the total metal value for each metal, multiplied by the conversion factor, summed and expressed in equivalent copper percentage with a metallurgical recovery factor applied. The copper equivalent calculation used is based off the eCu calculation defined by CSA in the 2018 Mineral Resource Upgrade.</p> <p>Copper equivalent (CuEq or eCu) grade values were calculated using the following formula:</p>																																				

Criteria	JORC Code explanation	Commentary
		$eCu \text{ or } CuEq = Cu + Au * 0.62097 * 0.8235,$ <p>Where:</p> <p>Cu - copper grade (%)</p> <p>Au - gold grade (g/t)</p> <p>0.62097- conversion factor (gold to copper)</p> <p>0.8235 - relative recovery of gold to copper (82.35%)</p> <p>The copper equivalent formula was based on the following parameters (prices are in USD):</p> <ul style="list-style-type: none"> <li>• Copper price - 3.1 \$/lb (or 6834 \$/t)</li> <li>• Gold price - 1320 \$/oz</li> <li>• Copper recovery - 85%</li> <li>• Gold recovery - 70%</li> </ul> <p>Relative recovery of gold to copper = 70% / 85% = 82.35%.</p>
<b>Relationship between mineralisation widths and intercept lengths</b>	<ul style="list-style-type: none"> <li>• <i>These relationships are particularly important in the reporting of Exploration Results.</i></li> <li>• <i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i></li> <li>• <i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').</i></li> </ul>	<ul style="list-style-type: none"> <li>• Mineralised structures are variable in orientation, and therefore drill orientations have been adjusted from place to place in order to allow intersection angles as close as possible to true widths.</li> <li>• Exploration results have been reported as an interval with 'from' and 'to' stated in tables of significant economic intercepts. Tables clearly indicate that true widths will generally be narrower than those reported.</li> </ul>
<b>Diagrams</b>	<ul style="list-style-type: none"> <li>• <i>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</i></li> </ul>	<ul style="list-style-type: none"> <li>• See figures in main report.</li> </ul>
<b>Balanced reporting</b>	<ul style="list-style-type: none"> <li>• <i>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Resources have been reported at a range of cut-off grades, above a minimum suitable for open pit mining, and above a minimum suitable for underground mining.</li> </ul>
<b>Other substantive</b>	<ul style="list-style-type: none"> <li>• <i>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological</i></li> </ul>	<ul style="list-style-type: none"> <li>• Extensive work in this area has been done and is reported separately. See the company website for significant announcements and</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>exploration data</b>	<i>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.</i>	milestones. Work that has been done includes; relogging of core, structural studies, alteration studies, geotechnical studies and preliminary metallurgical test works. The project has been subject to various geophysical studies including aeromagnetic, radiometric surveys and electromagnetic surveys over discrete targets.
<b>Further work</b>	<ul style="list-style-type: none"> <li><i>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</i></li> <li><i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i></li> </ul>	<ul style="list-style-type: none"> <li>The mineralisation is open at depth and along strike.</li> <li>Current estimates are restricted to those expected to be reasonable for open pit mining. Limited drilling below this depth (- 300m rl) shows widths and grades potentially suitable for underground extraction.</li> <li>Exploration is on-going.</li> </ul>

#### 1.4 JORC TABLE 1 – SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	JORC Code explanation	Commentary
<b>Database integrity</b>	<ul style="list-style-type: none"> <li><i>Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</i></li> <li><i>Data validation procedures used.</i></li> </ul>	<ul style="list-style-type: none"> <li>The database is managed using Micromine Geobank software. Data is logged directly into an Excel spread sheet logging system with drop down field lists. Validation checks are written into the importing program ensures all data is of high quality. Digital assay data is obtained from the Laboratory, QA/QC checked and imported. Geobank exported to CSV TEXT and imported directly to the Micromine software used for the MRE.</li> <li>The combined database was provided for the MRE.</li> <li>Validation of the data import include checks for the following: <ul style="list-style-type: none"> <li>Duplicate drill hole or trench names,</li> <li>One or more drill hole collar or trench coordinates missing in the collar file,</li> <li>FROM or TO missing or absent in the assay file,</li> <li>FROM &gt; TO in the assay file,</li> <li>Sample intervals overlap in the assay file,</li> <li>First sample is not equal to 0 m in the assay file,</li> <li>First depth is not equal to 0 m in the survey file,</li> <li>Several downhole survey records exist for the same depth,</li> <li>Azimuth is not between 0 and 360° in the</li> </ul> </li> </ul>

Criteria	JORC Code explanation	Commentary
		survey file, <ul style="list-style-type: none"> <li>• Dip is not between 0 and 90° in the survey file,</li> <li>• Azimuth or dip is missing in survey file,</li> <li>• Total depth of the holes is less than the depth of the last sample,</li> <li>• Total length of trenches is less than the total length of all samples.</li> <li>• Negative sample grades.</li> <li>• No logical errors were identified in the analytical data.</li> </ul>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>• <i>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</i></li> <li>• <i>If no site visits have been undertaken indicate why this is the case.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Warren Potma, an employee of CSA Global, visited the Kharmagtai project, located in Mongolia, over 4 days from 18th to 22nd September 2018.</li> <li>• The site visit was required for the purposes of inspection, ground truthing, review of activities, and collection of information and data.</li> </ul>
<b>Geological interpretation</b>	<ul style="list-style-type: none"> <li>• <i>Confidence in (or conversely, the uncertainty of ) the geological interpretation of the mineral deposit.</i></li> <li>• <i>Nature of the data used and of any assumptions made.</i></li> <li>• <i>The effect, if any, of alternative interpretations on Mineral Resource estimation.</i></li> <li>• <i>The use of geology in guiding and controlling Mineral Resource estimation.</i></li> <li>• <i>The factors affecting continuity both of grade and geology.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Geological data has been collected in a consistent manner that has allowed the development of geological models to support the Mineral Resource estimate. Copper and gold mineralisation is controlled by porphyry phases, oxidation zone, level of veining, breccia, country rocks and barren dykes.  Full geological models of all major geological formations were developed for each deposit, and the block models were domained accordingly.  Domaining of the deposit mineralisation was based on the current understanding of the deposits' geology. All major geological formations were wireframed by Xanadu geologists using Leapfrog software, including porphyry phases, country rocks, barren dyke, base of oxidation surface and breccia bodies. All geological formations were domained by the level of development of stockwork - &lt;0.5% veining, 0.5-1.5% veining and &gt;1.5% veining. All provided wireframe models were imported into Micromine software and validated by CSA Global.</li> <li>• Geological interpretation and wireframing were based on sampling results of drill holes and trenches, which were logged at 2 m intervals (average).</li> <li>• No alternative interpretations were adopted.</li> </ul>

Criteria	JORC Code explanation	Commentary																													
		<ul style="list-style-type: none"> <li>Lithological logging was mainly used to interpret and to wireframe the geological formations. Geological logging of veining was used to wireframe the stockwork and breccia domains.</li> </ul>																													
<b>Dimensions</b>	<ul style="list-style-type: none"> <li><i>The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.</i></li> </ul>	<ul style="list-style-type: none"> <li>Altan Tolgoi: The strike length of the mineralised zone is about 1,200 m. Width is up to 800 m, no plunging, traced down dip to 1,030 m. Mineralisation is outcropped at the surface.</li> <li>Tsagaan Sudal: The strike length of the mineralised zone is about 1,200 m. Width is up to 730 m, no plunging, traced down dip to 1,080 m. Mineralisation is outcropped at the surface.</li> <li>Zesen Uul: The strike length of the mineralised zone is about 630 m. Width is up to 150 m with apparent plunging to SW at about 40 degrees. traced down dip to 420 m dipping 70 degrees to SE. Mineralisation is outcropped at the surface.</li> </ul>																													
<b>Estimation and modelling techniques</b>	<ul style="list-style-type: none"> <li><i>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.</i></li> <li><i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</i></li> <li><i>The assumptions made regarding recovery of by-products.</i></li> <li><i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).</i></li> <li><i>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</i></li> <li><i>Any assumptions behind modelling of selective mining units.</i></li> <li><i>Any assumptions about correlation</i></li> </ul>	<ul style="list-style-type: none"> <li>The MRE is based on surface drilling and trenching results using Ordinary Kriging (OK) to inform 20 m x 20 m x 20 m blocks. The block model was constrained by wireframes modelled for the geological formations of the deposits and coded and domained by the level of oxidation and level of veining. The OK interpolation was carried out separately for each geological domain of each deposit. Hard boundaries were used between the interpreted geological domains. The drill hole and trench data were composited to a target length of 2 m based on the length analysis of raw intercepts. Top-cuts were estimated separately for gold and copper grades for each modelled domain and applied to sampled intervals before length compositing. Interpolation parameters were as follows:</li> </ul> <table border="1" data-bbox="901 1780 1436 1877"> <thead> <tr> <th rowspan="2">Interpolation method</th> <th colspan="4">Ordinary Kriging</th> </tr> <tr> <th>Less or equal to 1/3 of semi-variogram ranges</th> <th>Less or equal to 2/3 of semi-variogram ranges</th> <th>Less or equal to semi-variogram ranges</th> <th>Greater than semi-variogram ranges</th> </tr> </thead> <tbody> <tr> <td>Search radii</td> <td>3</td> <td>3</td> <td>3</td> <td>1</td> </tr> <tr> <td>Minimum no. of samples</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> </tr> <tr> <td>Maximum no. of samples</td> <td>2</td> <td>2</td> <td>2</td> <td>1</td> </tr> <tr> <td>Minimum no. of drillholes or trenches</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Previous JORC-compliant Mineral Resources were estimated by Mining Associates, and the estimate was available for review.</li> <li>No current mining is occurring at the Kharmagtai project.</li> </ul>	Interpolation method	Ordinary Kriging				Less or equal to 1/3 of semi-variogram ranges	Less or equal to 2/3 of semi-variogram ranges	Less or equal to semi-variogram ranges	Greater than semi-variogram ranges	Search radii	3	3	3	1	Minimum no. of samples	16	16	16	16	Maximum no. of samples	2	2	2	1	Minimum no. of drillholes or trenches				
Interpolation method	Ordinary Kriging																														
	Less or equal to 1/3 of semi-variogram ranges	Less or equal to 2/3 of semi-variogram ranges	Less or equal to semi-variogram ranges	Greater than semi-variogram ranges																											
Search radii	3	3	3	1																											
Minimum no. of samples	16	16	16	16																											
Maximum no. of samples	2	2	2	1																											
Minimum no. of drillholes or trenches																															

Criteria	JORC Code explanation	Commentary
	<p><i>between variables.</i></p> <ul style="list-style-type: none"> <li>• <i>Description of how the geological interpretation was used to control the resource estimates.</i></li> <li>• <i>Discussion of basis for using or not using grade cutting or capping.</i></li> <li>• <i>The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.</i></li> </ul>	<ul style="list-style-type: none"> <li>• No by-products are assumed at this stage. Estimated molybdenum and silver grades appear to be sub-economic to extract at this stage of the project evaluation.</li> <li>• Sulphur grades were interpolated into the models to establish their potential affect to metallurgical processing.</li> <li>• The optimal parent cell size was selected in the course of block modelling. The linear parent cell dimensions along X- and Y-axes were 20 m x 20 m. The vertical parent cell dimension was 20 m. Block grades were interpolated using parent cell estimation. Nominal drill spacing was about 40 m x 40 m at the central parts of the deposits.</li> <li>• It was assumed that a 20 m x 20 m x 20 m parent cell approximately reflects SMU for large scale open pit mining.</li> <li>• No assumptions about correlation between variables were made.</li> <li>• Geological interpretation was based on the results of detailed geological logging, which resulted in the development of wireframe models for all major geological formations for each deposit, which control copper and gold mineralisation (country rocks, porphyry phases, barren dyke. Logging of the level of veining and level of oxidation was used to develop wireframe models for the stockwork development (&lt;0.5% veining, 0.5-1.5% veining and &gt;1.5% veining) and also for breccia pipe and surface for the base of oxidation surface. The wireframe models for stockwork, breccia and oxidation were used to sub-domain the main geological formations of each deposit. All wireframe models were developed by Xanadu geologists using Leapfrog software.</li> <li>• Top-cutting was applied separately for each geological domain and sub-domain based on the results of the classical statistical analysis.</li> <li>• Grade estimation was validated using visual inspection of interpolated block grades vs. sample data, alternative interpolation methods and swath plots.</li> </ul>
<b>Moisture</b>	<ul style="list-style-type: none"> <li>• <i>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Moisture was not considered in the density assignment and all tonnage estimates are based on dry tonnes.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li>The basis of the adopted cut-off grade(s) or quality parameters applied.</li> </ul>	<ul style="list-style-type: none"> <li>A cut-off grade of 0.3% CuEq was used to report the Mineral Resources for open pit mining within the limits of ultimate undiscounted pit shell, and a cut-off of 0.5% CuEq was used to report the Mineral Resources for underground mining below the ultimate undiscounted pit shell.</li> </ul> <p>The copper equivalent (eCu) calculation represents the total metal value for each metal, multiplied by the conversion factor, summed and expressed in equivalent copper percentage with a metallurgical recovery factor applied.</p> <p>Copper equivalent (CuEq) grade values were calculated using the following formula:</p> $\text{CuEq} = \text{Cu} + \text{Au} * 0.62097 * 0.8235,$ <p>Where:</p> <p>Cu - copper grade (%)</p> <p>Au - gold grade (g/t)</p> <p>0.62097- conversion factor (gold to copper)</p> <p>0.8235 - relative recovery of gold to copper (82.35%)</p> <p>The copper equivalent formula was based on the following parameters (prices are in USD):</p> <ul style="list-style-type: none"> <li>Copper price - 3.1 \$/lb (or 6834 \$/t)</li> <li>Gold price - 1320 \$/oz</li> <li>Copper recovery - 85%</li> <li>Gold recovery - 70%</li> </ul> <p>Relative recovery of gold to copper = 70% / 85% = 82.35%.</p>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>No mining factors have been applied to the in-situ grade estimates for mining dilution or loss as a result of the grade control or mining process. The deposit is amenable to large scale bulk mining. The Mineral Resource is reported above and outside of an optimised ultimate pit shell (Lerch Grossman algorithm), mineralisation below the pit shell is reported at a higher cut-off to reflect the increased costs associated with block cave</li> </ul>

Criteria	JORC Code explanation	Commentary
	<p><i>parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.</i></p>	<p>underground mining.</p>
<p><b>Metallurgical factors or assumptions</b></p>	<ul style="list-style-type: none"> <li><i>The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.</i></li> </ul>	<ul style="list-style-type: none"> <li>No metallurgical factors have been applied to the in-situ grade estimates. Metallurgical recoveries were used when copper equivalent grades were calculated in the model. The applied recoveries were 85% for copper and 70% for gold. Relative gold to copper recovery was 82%.</li> </ul>
<p><b>Environmental factors or assumptions</b></p>	<ul style="list-style-type: none"> <li><i>Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.</i></li> </ul>	<ul style="list-style-type: none"> <li>An environmental baseline study was completed in 2003 by Eco Trade Co. Ltd. of Mongolia in cooperation with Sustainability Pty Ltd of Australia. The baseline study report was produced to meet the requirements for screening under the Mongolian Environmental Impact Assessment (EIA) Procedures administered by the Mongolian Ministry for Nature and Environment (MNE).</li> </ul>
<p><b>Bulk density</b></p>	<ul style="list-style-type: none"> <li><i>Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.</i></li> <li><i>The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and</i></li> </ul>	<ul style="list-style-type: none"> <li>A total of 4428 measurements for bulk density are recorded in the database, all of which were determined by the water immersion method.</li> <li>The average density of all samples is approximately 2.75 t/m<sup>3</sup>. In detail there are some differences in density between different rock types. Therefore, since the model includes all major geological domains, density values were applied separately for each domain:</li> </ul>

Criteria	JORC Code explanation	Commentary																																									
	<p><i>differences between rock and alteration zones within the deposit.</i></p> <ul style="list-style-type: none"> <li>• <i>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</i></li> </ul>	<table border="1" data-bbox="1018 331 1369 790"> <thead> <tr> <th>Deposit</th> <th>Domain</th> <th>Density, t/m3</th> </tr> </thead> <tbody> <tr> <td rowspan="5">TS</td> <td>OXIDE ZONE</td> <td>2.65</td> </tr> <tr> <td>CRD</td> <td>2.76</td> </tr> <tr> <td>CRS</td> <td>2.74</td> </tr> <tr> <td>P2</td> <td>2.78</td> </tr> <tr> <td>P5</td> <td>2.80</td> </tr> <tr> <td rowspan="6">AT</td> <td>Breccia</td> <td>2.78</td> </tr> <tr> <td>OXIDE ZONE</td> <td>2.65</td> </tr> <tr> <td>CR</td> <td>2.73</td> </tr> <tr> <td>P1</td> <td>2.78</td> </tr> <tr> <td>P2</td> <td>2.78</td> </tr> <tr> <td>P3</td> <td>2.77</td> </tr> <tr> <td rowspan="5">ZU</td> <td>TAND</td> <td>2.76</td> </tr> <tr> <td>OXIDE ZONE</td> <td>2.65</td> </tr> <tr> <td>CR</td> <td>2.71</td> </tr> <tr> <td>P1</td> <td>2.81</td> </tr> <tr> <td>P2</td> <td>2.76</td> </tr> <tr> <td></td> <td></td> <td>2.76</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Average bulk density values were applied for each geological domain, though there could be variations in density values due to presence of sulphides or level of alteration.</li> </ul>	Deposit	Domain	Density, t/m3	TS	OXIDE ZONE	2.65	CRD	2.76	CRS	2.74	P2	2.78	P5	2.80	AT	Breccia	2.78	OXIDE ZONE	2.65	CR	2.73	P1	2.78	P2	2.78	P3	2.77	ZU	TAND	2.76	OXIDE ZONE	2.65	CR	2.71	P1	2.81	P2	2.76			2.76
Deposit	Domain	Density, t/m3																																									
TS	OXIDE ZONE	2.65																																									
	CRD	2.76																																									
	CRS	2.74																																									
	P2	2.78																																									
	P5	2.80																																									
AT	Breccia	2.78																																									
	OXIDE ZONE	2.65																																									
	CR	2.73																																									
	P1	2.78																																									
	P2	2.78																																									
	P3	2.77																																									
ZU	TAND	2.76																																									
	OXIDE ZONE	2.65																																									
	CR	2.71																																									
	P1	2.81																																									
	P2	2.76																																									
		2.76																																									
<p><b>Classification</b></p>	<ul style="list-style-type: none"> <li>• <i>The basis for the classification of the Mineral Resources into varying confidence categories.</i></li> <li>• <i>Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).</i></li> <li>• <i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i></li> </ul>	<ul style="list-style-type: none"> <li>• The Mineral Resource has been classified based on the guidelines specified in the JORC Code. The classification level is based upon an assessment of geological understanding of the deposit, geological and mineralization continuity, drill hole spacing, QC results, search and interpolation parameters and an analysis of available density information.</li> </ul> <p>The following approach was adopted:</p> <ul style="list-style-type: none"> <li>○ Measured Resources: Not reported.</li> <li>○ Indicated Resources: It was decided that Indicated Mineral Resources be assigned to blocks which were explored with the drill density not exceeding approximately 65 m x 65 m with at least two mineralization intersections on exploration lines. Geological structures are relatively well understood and interpreted.</li> <li>○ Inferred Resources: Inferred Mineral Resources are model blocks lying outside the Indicated wireframes, which still display reasonable strike continuity and down dip extension, based on the current drill hole and trench intersections.</li> </ul> <ul style="list-style-type: none"> <li>• Data quality, grade continuity, structural continuity and drill spacing were assessed by CSA Global to form an opinion regarding resource confidence.</li> <li>• The classification reflects the Competent</li> </ul>																																									

Criteria	JORC Code explanation	Commentary
		Person's view of the deposit.
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li><i>The results of any audits or reviews of Mineral Resource estimates.</i></li> </ul>	<ul style="list-style-type: none"> <li>The Mineral Resource block model was peer reviewed internally by a Principal Resource Geologist employed by CSA Global and the conclusion was made that the procedures used to estimate and classify the Mineral Resource are appropriate.</li> </ul>
<b>Discussion of relative accuracy/confidence</b>	<ul style="list-style-type: none"> <li><i>Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</i></li> <li><i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i></li> <li><i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>	<ul style="list-style-type: none"> <li>Industry standard modelling techniques were used, including but not limited to:           <ul style="list-style-type: none"> <li>Classical statistical analysis,</li> <li>Interpretation and wireframing of main geological formations,</li> <li>Top-cutting and interval compositing,</li> <li>Domaining of the model using level of logging veining, breccia and zone of oxidation,</li> <li>Geostatistical analysis,</li> <li>Block modelling and grade interpolation techniques,</li> <li>Model classification, validation and reporting,</li> </ul> </li> <li>The relative accuracy of the estimate is reflected in the classification of the deposit.</li> <li>The estimate is related to the global estimate of the deposit suitable for subsequent PFS or further exploration at the deposit.</li> <li>No historical production data is available for comparison with the MRE.</li> <li>The Mineral Resource accuracy is communicated through the classification assigned to various parts of the deposit.</li> </ul>

## 1.5 JORC TABLE 1 – SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

Ore Reserves are not reported so this is not applicable to this report.