Increased Recoveries From Sulphide Metallurgical Work at Kharmagtai

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TORONTO, Dec. 11, 2019 - 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 (Figures 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
Alb MC-LCT1	3rd Cleaner Con	1.0	25.57	31.60	30.04	35.80	89.7	5.4	78.7	41.2
	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				
Ser_Chl MC-LCT1	3rd Cleaner Con	1.2	24.77	21.50	21.49	34.96	89.3	5.0	60.8	14.1
	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				
Average	3rd Cleaner Con	1.1	25.2	26.5	25.8	35.4	89.5	5.2	69.7	27.7

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_Chl 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
1	White Hill	Potassic_dio	36.8	minor contribution (<10%) in early years of mining	VARI
2		Potassic_slt	38.35	minor contribution (<10%) in early years of mining	VARI
3		Ser_chl	49.45	represents 40% of sulphide tonnage in early years of mining	VARI
4		Alb	53.15	represents 40% of sulphide tonnage in early years of mining	VARI

5	Copper Hill	Ser_chl	34.35	represents 45% of sulphide tonnage in early years	VARI
6		Alb	38.3	represents 45% of sulphide tonnage in early years	VARI
7		Ser_chl	51.3	represents 40% of sulphide tonnage in early years	VARI
8		Alb	39.95	represents 40% of sulphide tonnage in early years	VARI
9	Master Comp	TBX	49.3	<10% of sulphide tonnage in early years	MASTER
10		Alb	51	17-kg from #4, 17-kg from #6, 17-kg from #8	MASTER
11		Ser_chl	51	17-kg from #3, 17-kg from #5, 17-kg from #7	MASTER

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
Average	0.31	6.47	2.07	0.39
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 11th 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.

Photos accompanying this announcement are available at:

https://www.globenewswire.com/NewsRoom/AttachmentNg/fb4e6589-ea5b-4df4-bb35-beebe1c4fd1e

https://www.globenewswire.com/NewsRoom/AttachmentNg/6b75a81a-f964-4914-977d-20827916c320

https://www.globenewswire.com/NewsRoom/AttachmentNg/eb539ff2-5856-459e-9255-993eff792513

https://www.globenewswire.com/NewsRoom/AttachmentNg/548dea6e-43c4-4d92-b640-831f2e95396d

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.

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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
Sampling techniques	● *Nature and quality of sampling (eg cut channels, random ch* ● *Include reference to measures taken to ensure sample repre* ● *Aspects of the determination of mineralisation that are Mate* ● *In cases where ‘industry standard’ work has b*
Drilling techniques	● *Drill type (e.g. core, reverse circulation, open-hole hammer,*
Drill sample recovery	● *Method of recording and assessing core and chip sample re* ● *Measures taken to maximise sample recovery and ensure re* ● *Whether a relationship exists between sample recovery and*
Logging	● *Whether core and chip samples have been geologically and* ● *Whether logging is qualitative or quantitative in nature. Core* ● *The total length and percentage of the relevant intersections*
Sub-sampling techniques and sample preparation	● *If core, whether cut or sawn and whether quarter, half or all* ● *If non-core, whether riffled, tube sampled, rotary split, etc an* ● *For all sample types, the nature, quality and appropriatenes* ● *Quality control procedures adopted for all sub-sampling stag* ● *Measures taken to ensure that the sampling is representativ* ● *Whether sample sizes are appropriate to the grain size of th*

Quality of assay data and laboratory tests	● *The nature, quality and appropriateness of the assaying and* ● *For geophysical tools, spectrometers, handheld XRF instrum* ● *Nature of quality control procedures adopted (eg standards,*
Verification of sampling and assaying	● *The verification of significant intersections by either indepen* ● *The use of twinned holes.* ● *Documentation of primary data, data entry procedures, data* ● *Discuss any adjustment to assay data.*
Location of data points	● *Accuracy and quality of surveys used to locate drill holes (co* ● *Specification of the grid system used.* ● *Quality and adequacy of topographic control.*
Data spacing and distribution	● *Data spacing for reporting of Exploration Results.* ● *Whether the data spacing and distribution is sufficient to esta* ● *Whether sample compositing has been applied.*
Orientation of data in relation to geological structure	● *Whether the orientation of sampling achieves unbiased sam* ● *If the relationship between the drilling orientation and the ori*
Sample security	● *The measures taken to ensure sample security.*
Audits or reviews	● *The results of any audits or reviews of sampling techniques*

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

Criteria	JORC Code explanation

Mineral tenement and land tenure status	● *Type, reference name/number, location and ow* ● *The security of the tenure held at the time of re*
Exploration done by other parties	● *Acknowledgment and appraisal of exploration b*
Geology	● *Deposit type, geological setting and style of mi*
Drill hole Information	● *A summary of all information material to the un* ° *easting and northing of the drill hole collar* ° elevation or RL (Reduced Level – elev ° dip and azimuth of the hole ° down hole length and interception depth ° *hole length.* ● *If the exclusion of this information is justified or*
Data aggregation methods	● *In reporting Exploration Results, weighting ave* ● *Where aggregate intercepts incorporate short l* ● *The assumptions used for any reporting of met*
Relationship between mineralisation widths and intercept lengths	● *These relationships are particularly important i* ● *If the geometry of the mineralisation with respe* ● *If it is not known and only the down hole length*
Diagrams	● *Appropriate maps and sections (with scales) a*

Balanced reporting	● *Where comprehensive reporting of all Explorati*
Other substantive exploration data	● *Other exploration data, if meaningful and mater*
Further work	● *The nature and scale of planned further work (e* ● *Diagrams clearly highlighting the areas of poss*

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

Criteria	JORC Code explanation
Database integrity	● *Measures taken to ensure that data has not been corrupted by, for ex* ● *Data validation procedures used.*
Site visits	● *Comment on any site visits undertaken by the Competent Person an* ● *If no site visits have been undertaken indicate why this is the case.*
Geological interpretation	● *Confidence in (or conversely, the uncertainty of) the geological inter* ● *Nature of the data used and of any assumptions made.* ● *The effect, if any, of alternative interpretations on Mineral Resource e* ● *The use of geology in guiding and controlling Mineral Resource estin* ● *The factors affecting continuity both of grade and geology.*
Dimensions	● *The extent and variability of the Mineral Resource expressed as leng*

Estimation and modelling techniques	● *The nature and appropriateness of the estimation technique(s) applie* ● *The availability of check estimates, previous estimates and/or mine p* ● *The assumptions made regarding recovery of by-products.* ● *Estimation of deleterious elements or other non-grade variables of ec* ● *In the case of block model interpolation, the block size in relation to t* ● *Any assumptions behind modelling of selective mining units.* ● *Any assumptions about correlation between variables.* ● *Description of how the geological interpretation was used to control t* ● *Discussion of basis for using or not using grade cutting or capping.* ● *The process of validation, the checking process used, the compariso*
Moisture	● *Whether the tonnages are estimated on a dry basis or with natural m*
Cut-off parameters	● *The basis of the adopted cut-off grade(s) or quality parameters applie*
Mining factors or assumptions	● *Assumptions made regarding possible mining methods, minimum mi*
Metallurgical factors or assumptions	● *The basis for assumptions or predictions regarding metallurgical ame*
Environmental factors or assumptions	● *Assumptions made regarding possible waste and process residue di*

Bulk density	● *Whether assumed or determined. If assumed, the basis for the assu* ● *The bulk density for bulk material must have been measured by meth* ● *Discuss assumptions for bulk density estimates used in the evaluatio*
Classification	● *The basis for the classification of the Mineral Resources into varying* ● *Whether appropriate account has been taken of all relevant factors (* ● *Whether the result appropriately reflects the Competent Person&rsqu*
Audits or reviews	● *The results of any audits or reviews of Mineral Resource estimates.*
Discussion of relative accuracy/ confidence	● *Where appropriate a statement of the relative accuracy and confiden* ● *The statement should specify whether it relates to global or local esti* ● *These statements of relative accuracy and confidence of the estimat*

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.