Asiamet Resources

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# **BKM Copper Project - Positive Metallurgical Test-work Results**

Asiamet Resources Limited ("ARS") is pleased to report positive results from column leach test-work being undertaken as part of the Bankable Feasibility Study on the Beruang Kanan Main ("BKM") copper deposit. The metallurgical results received to date are in line with previous expectations as outlined in the BKM Preliminary Economic Assessment (as announced on 5<sup>th</sup> April 2016). These results will form the basis for the key inputs into the detailed design criteria for the leaching, solvent extraction and electro-winning facilities. Key highlights include:

- Following a 200-day leach cycle that applied a typical acidic leach solution to the short columns (2m), the majority of the soluble copper as determined by sequential copper analysis was recovered (see summary ranges of results in the following bullet point). The amount of soluble copper present in the residual material (post-leaching) for most columns was less than 0.1% Cu<sub>sol</sub>,
- Soluble copper recoveries, for the preferred crush size (P80=12.5mm), ranged from 73% to 89% (%Cu<sub>sol</sub>) with recoveries for the composites representing a significant proportion of the orebody being in the 80% to 85% Cu<sub>sol</sub> range.
- Rates of copper extraction from the short columns suggest optimal soluble copper recovery can be achieved with favourable acid consumption characteristics i.e. little or no acid being consumed. This is highly positive from both a transport & logistics and project economics perspective.
- Preliminary interpretations indicate that the leaching performance of the long columns (6m) appear consistent with the performance of the short columns.
- Following a 270-day leach cycle, residual material from the long columns has been sent for assaying. Assay results for the long columns are expected to be available for analysis early in the New Year.

## **Background**

Asiamet completed a 122-hole Resource evaluation drilling programme, as part of the BKM Feasibility Study. The results of this Resource evaluation were announced on 28 June 2017, with a supporting technical report filed on 15 August 2017. During this programme, a number of holes were specifically drilled throughout the BKM deposit to collect representative samples of various material types and grades for detailed metallurgical test-work.

From these samples, six composites were prepared and a total of 20 columns, comprising 12 short columns (2-metre) and 8 long columns (6-metre), were prepared and operated at the CORE Resources laboratory, in Brisbane, Australia. Each composite was tested at two crush sizes (i.e. P80 of 12.5 mm and P80 of 19 mm). Preparatory work ensured the columns were loaded with appropriately agglomerated material and set with suitable bulk density conditions.



After a 200-day leach cycle for the short columns, applying a typical acidic leach solution, the majority of the leachable copper was recovered. The columns were subsequently de-commissioned and the residual material sent for assaying.

All assays have been received for the residual material from the 12 short columns. The detailed diagnostic analytical procedures, including sequential copper assays developed for the BKM mineralisation, have allowed for head grades to be verified through mass-balance calculations for each column. These calculations have been utilised to evaluate recoveries of total copper (%Cu<sub>Tot</sub>) and soluble copper (%Cu<sub>sol</sub>) for each column. Table 1 summarises the results for each of the 12 short columns.

Copper recoveries from the short column test-work programme are in-line with expectations of the BKM Preliminary Economic Assessment ("PEA") as announced on 5<sup>th</sup> April 2016 (85% recovery of the leachable copper) and confirm that the copper minerals in the BKM deposit are amenable to heap leaching. The rates of extraction from the columns suggest optimal soluble copper recovery can be achieved with 3 to 4 kilolitres of solution per tonne of ore under leach. Under these conditions the acid consumption characteristics of the ore appear favourable, with little or no acid being consumed.

The soluble copper present in the residual (post-leaching) material was less than 0.1% Cu<sub>sol</sub> for most of the short columns. The sequential copper analysis indicates that the remaining soluble copper within the residual material is predominantly present as slow-leaching covellite, with a higher occurrence in the coarser (+6.75 mm) size fractions.

Based on the leach column performance to-date and supported by preliminary geotechnical and hydrodynamic studies being undertaken currently (HydroGeoSense metallurgical test-work programme), the mined ore fed to the heap leach pads will adopt the finer crush size (P80=12.5 mm) as the design criteria for the BKM Copper Project.

### **Ongoing Metallurgical Testing**

The long columns (6-metre) operating at the CORE Resources laboratory were de-commissioned during November, after a 270-day leach cycle. The residual material has been sent for assaying, utilising the same procedures and protocols that were used for the short columns material. The assay results for the 6-metre columns are expected to be available for analysis early in the New Year. Reporting for this round of metallurgical test-work will follow shortly thereafter. Preliminary interpretations indicate that the leaching performance of the long columns appear consistent with the performance of the short columns.

The leach column test-work provides key design criteria for the leaching, solvent extraction and electrowinning facilities that will be designed as part of the BKM Feasibility Study. An additional round of column test-work will be undertaken, with selected samples already collected from the BKM copper deposit. This further test-work will allow the study team to optimise and refine the metallurgical performance characteristics for the BKM Copper Project. It is expected that the leach columns will be loaded with the selected composites early in the 2018. These columns will run beyond the timeline for the BKM Feasibility Study and form part of the post Feasibility Study detailed engineering design.

The detailed chemical characterisation from the leaching test-work programme when combined with the hydrodynamic testing programme, which is being conducted at the world-leading HydroGeoSense ("HGS") facility in Arizona, will provide critical information to support the development of the BKM Feasibility Study and to establish the leach recovery targets for the operation. Metallurgy data generated from both programmes will allow the project team to develop a robust and optimised set of design criteria for the heap-leach pads and overall process engineering work.

#### Peter Bird, Asiamet's Chief Executive Officer commented:

"It is very pleasing to see that the results from the ongoing detailed column leach test-work confirm and support the recoveries and acid consumption predictions from the BKM PEA. This information will be



coupled with the outcomes of the hydrodynamic testing currently in progress and nearing completion, to provide key inputs to the design criteria for the proposed leaching, solvent extraction and electro-winning facilities at BKM. The significant amount of quality data generated from this metallurgical programme together with our detailed resource models provides a very solid basis for the mining and process engineering now underway.

The BKM Bankable Feasibility Study ("BFS") continues to progress to plan, with concurrent work ongoing in the social and environmental, commercial/financial and technical disciplines. We look forward to reporting the results of the long column leaching and hydrodynamic test-work shortly, along with outputs from the other BFS work streams and our exciting ongoing exploration activities as they come to hand."

### **Qualified Person**

Data disclosed in this press release have been reviewed and verified by Mr David Readett, of Mworx Pty Ltd, who is a Chartered Professional Metallurgical Engineer (CP(Met)) and a Fellow of the Australian Institute of Mining and Metallurgy (AusIMM). Mr Readett has sufficient experience which is relevant to the style of mineralisation and processing methods under consideration and to the activity which he is undertaking to qualify as a Competent Person for the purposes of the AIM Rules.

### ON BEHALF OF THE BOARD OF DIRECTORS

Peter Bird, Deputy Chairman and CEO

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This news release contains forward-looking statements that are based on the Company's current expectations and estimates. Forward-looking statements are frequently characterised by words such as "plan", "expect", "project", "intend", "believe", "anticipate", "estimate", "suggest", "indicate" and other similar words or statements that certain events or conditions "may" or "will" occur. Such forward-looking statements involve known and unknown risks, uncertainties and other factors that could cause actual events or results to differ materially from estimated or anticipated events or results implied or expressed in such forward-looking statements. Such factors include, among others: the actual results of current exploration activities; conclusions of economic evaluations; changes in project parameters as plans continue to be refined; possible variations in ore grade or recovery rates; accidents, labour disputes and other risks of the mining industry; delays in obtaining governmental approvals or financing; and fluctuations in metal prices. There may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. Any forward-looking statement speaks only as of the date on which it is made and, except as may be required by applicable securities laws, the Company disclaims any intent or obligation to update any forward-looking statements are not guarantees of future performance and accordingly undue reliance should not be put on such statements due to the inherent uncertainty therein.

This announcement contains inside information as stipulated under the Market Abuse Regulations (EU) no. 596/2014 ("MAR").

Column ID	Crush Size (P80)	Recalculated Head (%Cu <sub>Tot</sub> )	Recalculated Head Soluble (%Cu <sub>sol</sub> )	Total Cu Recovered (%)	Soluble Cu Recovered (%)
1	12.5mm	0.48	0.37	68.8	88.5
2	19mm	0.51	0.39	62.0	81.5
3	12.5mm	0.58	0.36	49.3	79.4
4	19mm	0.54	0.33	45.4	72.9
5	12.5mm	0.66	0.53	70.2	86.4
6	19mm	0.57	0.46	58.6	73.8
7	12.5mm	0.75	0.54	55.7	76.9
8	19mm	0.69	0.51	51.6	69.8
9	12.5mm	0.75	0.60	65.5	82.1
10	19mm	0.76	0.58	55.6	72.4
11	12.5mm	0.38	0.33	62.4	73.3
12	19mm	0.35	0.30	57.2	66.8

### Table 1: Short Column Leaching Recovery Summary

Notes: All columns were 150 mm in diameter, and 2000 mm in height.

#### **Glossary of Technical Terms**

"CIM"	The reporting standard adopted for the reporting of the
	Mineral Resources is that defined by the terms and
	definitions given in the terminology, definitions and
	guidelines given in the Canadian Institute of Mining,
	Metallurgy and Petroleum (CIM) Standards on Mineral
	resources and Mineral Reserves (December 2005) as
	required by NI 43-101. The CIM Code is an internationally



	recognised reporting code as defined by the Combined Reserves International Reporting Standards Committee
"g/t" "Indicated Resource"	grams per tonne; equivalent to parts per million ('ppm'). An "Indicated Mineral Resource" is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.
"Inferred Resource"	An "Inferred Mineral Resource" is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.
"Measured Resource"	Pounds (measure of weight)A "Measured Mineral Resource" is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.
"Mineral Resource"	A "Mineral Resource" is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilised organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.
"anomaly or anomalous"	something in mineral exploration that geologists interpret as deviating from what is standard, normal, or expected.
"assay"	The laboratory test conducted to determine the proportion of a mineral within a rock or other material.



	For copper, usually reported as percentage which is
	equivalent to percentage of the mineral (i.e. copper)
	per tonne of rock
"azimuth"	the "compass direction" refers to a geographic bearing
	or azimuth as measured by a magnetic compass, in true
	or magnetic north
"bornite"	Bornite, also known as peacock ore, is a copper
	sulphide mineral with the formula Cu5FeS4
"breccia"	Breccia is a rock classification, comprises millimetre to
	metre-scale rock fragments cemented together in a
	matrix, there are many subclassifications of breccias.
"chalcocite"	Chalcocite is a copper sulphide mineral with the
	formula Cu2S, and is an important copper ore mineral.
	It is opaque and dark-gray to black with a metallic
	luster.
"chalcopyrite"	Chalcopyrite is a copper sulphide mineral with formula
	CuFeS2. It has a brassy to golden yellow color
"channel sample"	Samples collected across a mineralised rock exposure.
	The channel is typically orientated such that samples
	are collected perpendicular to the mineralised
"Chargeability"	structure, if possible
"Chargeability"	Chargeability is a physical property related to
	conductivity. Chargeability is used to characterise the formation and strength of the induced polarisation
	within a rock, under the influence of an electric field,
	suggesting sulphide mineralisation at depth
"column test"	A hydrometallurgical testing program to define the
column test	basic criteria, such as recovery and acid consumption,
	for a commercial heap leach system design
"covellite"	Covellite is a copper sulphide mineral with the formula
	CuS. This indigo blue mineral is ubiquitous in some
	copper ores
"Cu <sub>sol</sub> "	Soluble copper content of the rock (expressed in %)
"Cu <sub>Tot</sub> "	Total copper content of the rock (expressed in %)
	regardless of solubility
"diamond drilling"	A drilling method in which penetration is achieved
	through abrasive cutting by rotation of a diamond
	encrusted drill bit. This drilling method enables collection
	of tubes of intact rock (core) and when successful gives
	the best possible quality samples for description,
	sampling and analysis of an ore body or mineralised
	structure.
"dip"	A line directed down the stormert with of a stormer
"dip"	A line directed down the steepest axis of a planar
	structure including a planar ore body or zone of mineralisation. The dip has a measurable direction and
	inclination from horizontal
"galena"	Galena is the natural mineral form of lead (II) sulphide,
gaiona	with formula PbS. It is the most important ore of lead and
"grab sample"	an important source of silver. It has a silver color are samples of rock material collected from a small



	rock "grabbed" from a face, dump or outcrop or
	roughly 2-5kg. These are common types of rock samples
	collected when conducting mineral exploration. The
	sample usually consists of material that is taken to be
	representative of a specific type of rock or mineralisation.
"grade"	The proportion of a mineral within a rock or other
	material. For copper mineralisation this is usually reported as % of copper per tonne of rock (g/t)
"hypogene"	Hypogene ore processes occur deep below the earth's
	surface, and form deposits of primary minerals, such as
	chalcopyrite and bornite.
"Induced Polarisation Geophysics"	Induced polarisation (IP) is a geophysical survey used to
	identify the electrical chargeability of subsurface
	materials, such as sulphides. The survey involves an electric current that is transmitted into the subsurface
	through two electrodes, and voltage is monitored
	through two other electrodes.
"intercept"	Refers to a sample or sequence of samples taken across
'	the entire width or an ore body or mineralised zone. The
	intercept is described by the entire thickness and the
	average grade of mineralisation
"massive"	In a geological sense, refers to a zone of mineralisation
	that is dominated by sulphide minerals. The sulphide-
	mineral-rich material can occur in centimetre-scale,
	metre-scale or in tens of metres wide veins, lenses or
	sheet-like bodies containing sphalerite, galena, and / or
"mineralisation"	chalcopyrite etc.
	In geology, mineralisation is the deposition of economically important metals (copper, gold, lead, zin
	etc) that in some cases can be in sufficient quantity to
	form mineral ore bodies.
"Mlbs"	Million pounds (measure of weight)
"open pit mining"	A method of extracting minerals from the earth by
	excavating downwards from the surface such that the
	ore is extracted in the open air (as opposed to
	underground mining)
"outcrop"	A section of a rock formation or mineral vein that
	appears at the surface of the earth. Geologists take
	direct observations and samples from outcrops, used in
	geologic analysis and creating geologic maps. In situ (in
	place) measurements are critical for proper analysis of
	the geology and mineralisation of the area under
	investigation.
"P80"	Refers to the particle size at which 80% of the material
	will pass through when screened
"polymetallic"	three or more metals that may occur in magmatic,
	volcanogenic, or hydrothermal environments; common
	base and precious metals include copper, lead, zinc,
"polymict"	silver and gold A geology term, often applied to breccias or
polymici	conglomerates, which identifies the composition as
	consisting of fragments of several different rock types.



"Preliminary Economic Assessment"	NI 43-101 defines a PEA as "a study, other than a pre-
	feasibility study or feasibility study, which includes an
	economic analysis of the potential viability of mineral
	resources"
"sediments"	Sedimentary rocks formed by the accumulation of
	sediments. There are three types, Clastic, Chemical and
	Organic sedimentary rocks
"sequential assays"	Sequential copper analysis is a technique to semi-
	quantitatively define the zonations associated with
	some copper deposits. The method is based on the
	partial dissolution behavior displayed by the prevalent copper minerals to solutions containing sulphuric acid
	and sodium cyanide. Results from sequential analyses
	can theoretically determine the amounts of leachable
	oxide minerals, leachable secondary sulphide minerals,
	and primary copper minerals, respectively.
"soluble copper"	The fraction of total copper which is acid-soluble
	(sometimes used as a proxy for oxide copper content)
	and so potentially recoverable by heap leaching
"sphalerite"	Sphalerite is a zinc sulphide in crystalline form but almost
	always contains variable iron, with formula (Zn,Fe)S. It
	can have a yellowish to honey brown or black color
"supergene"	Supergene ore processes occur near surface, and form
	deposits of secondary minerals, such as malachite,
"surface rock chip samples"	azurite, chalcocite, covellite, digenite, etc. Rock chip samples approximately 2kg in size that are
surace fock chip samples	typically collected from surface outcrops exposed
	along rivers and mountain ridgelines
"veins"	A vein is a sheet-like or anastomosing fracture that has
	been infilled with mineral ore (chalcopyrite, covellite
	etc) or mineral gangue (quartz, calcite etc) material,
	within a rock. Veins form when minerals carried by an
	aqueous solution within the rock mass are deposited
	through precipitation and infill or coat the fracture
	faces.
"volcanics"	Volcanic rock such as andesite or basalt that is formed
	from magma erupted from a volcano, or hot clastic
	material that erupts from a volcano and is deposited as
	volcaniclastic or pyroclastics