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Bramaderos gold-copper project, Ecuador

Exploration breakthrough leads to identification of numerous higher-grade gold-copper porphyry targets

Review of drilling results combined with new magnetic data shows the porphyries are likely to exhibit 'pipe-like' geometry rather than broad disseminated geometry as previously thought

Key Points

- Detailed technical review leads to a major breakthrough in understanding the multiple goldcopper porphyry deposits identified within the Bramaderos concession
- The findings stem from a review of exploration results and specifically from drilling results, more detailed magnetic data, and 3-D modelling
- The overwhelming evidence suggests that the porphyry systems exhibit pipe-like geometry similar to many other porphyry deposits, such as Northparkes in Australia, and others globally
- Exploration to date has been based on the belief that the porphyries at Bramaderos have broad, widely disseminated geometries, which are common elsewhere such as in Chile
- New investor presentation to be lodged with ASX and on the Sunstone website
- "These findings explain why we have intersected very wide zones of lower-grade mineralisation and other focussed areas with economic grades. We now have a much greater understanding of where the higher-grade mineralisation is likely to sit and as a result, we have identified multiple compelling targets for drill testing." – Sunstone MD Malcolm Norris

Sunstone Metals Limited (ASX:STM) is pleased to announce that an in-depth review of all exploration data from its Bramaderos Gold-Copper Project in Ecuador has resulted in a significant breakthrough, which has in turn led to the identification of numerous, compelling drill targets.

In simple terms, the review found that the higher-grade gold-copper porphyries exhibit pipe-like geometry, not broad, disseminated geometry as previously believed.



Some leading porphyries globally display this pipe-like geometry, while many other porphyries, such as those in Chile and Asia, exhibit broader disseminated geometries (on which the original exploration model for Bramaderos was based).

These geometries for pipe-like or 'pencil porphyry' style porphyry gold-copper systems are not unusual and better-known examples include the Northparkes mine in NSW, the Skouries deposit in Greece, and the Boyongan deposit in the Philippines. These deposits are typically smaller individually but cluster as multiple deposits and deliver higher grades.

An updated Investor Presentation is to be lodged with the ASX and can also be viewed on the Sunstone website. The presentation outlines this latest work in greater detail.

Sunstone Managing Director Malcolm Norris said: "Our technical review of the results to date from Bramaderos has delivered some compelling new interpretations of the gold-copper porphyry systems within the project. Some have been real 'eye openers' such as the detailed ground magnetics and associated 3-D modelling.

"In isolation, this is a standard exploration evolution, but combined with our drilling results to date, and surface sampling we have every reason to be very bullish about discovery.

"The interpretation of the geometry of these porphyry systems has been enhanced and the potential for building significant tonnes, and at higher grades, is vastly improved.

Details of the Review

The review considered each of the six gold-copper mineralised systems within the Bramaderos project and the two currently defined epithermal gold targets.

All the gold-copper porphyry systems are mineralised, and the review focussed on targeting the higher-grade domains within these systems.

The review identified that a later higher-grade event can now be defined and is related to pipe-like intrusive bodies that are mappable based on the 3-D modelling of the more detailed ground magnetics.

These pipe-like bodies cluster within each system, so for example at Brama, five targets exist and correlate with higher grades where drilled (Figure 4).

At Playas the pipe-like magnetic bodies correlate with areas of highest-grade gold and copper in surface samples giving us confidence that drilling will extend that mineralisation to depth. Playas has never been drilled.

Melonal, Porotillo and Sandia all present similar relationships.

At Porotillo a historical drill hole (CURI-05) intersected 26m at 1.1g/t gold and 0.2% copper demonstrating that significantly higher grades can be delivered from these systems.



Further Assay Results from Limon

Assay results from drill hole LMDD006 at Limon have been received. The drill hole intersected an upper high sulphidation gold interval of 131.3m at 0.18g/t gold from surface, with individual samples of up to 1.6m wide grading 1.2g/t gold. Copper grades were locally anomalous with up to 0.16% copper and 0.4g/t gold over 0.9m widths. This high sulphidation interval is a correlative of that intersected in LMDD004 which returned 59.6m at 0.16% copper from 57.8m down hole, including 13.3m at 0.43% copper and 0.11g/t gold from 57.8m (see ASX announcement dated 15 October 2019).

Deeper intervals in LMDD006 intersected intensely phyllic altered intrusive rocks and breccias and only locally gold and copper anomalous intervals. Together with the results from holes LMDD002 and LMDD004 we are now seeing vectors that suggest a target zone to the south.

Temporary Suspension of Field Activities in Ecuador

Exploration activities at the Bramaderos Project have been temporarily suspended in line with the directives of the Ecuadorian government decree declaring a nationwide emergency to manage the risks associated with coronavirus. Sunstone takes the welfare of its employees very seriously and will review plans frequently to make sure that we are managing this risk appropriately. Desktop activities, primarily in Australia, are ongoing as we interpret data to move target areas towards being drill ready when the suspensions are lifted.

Table 1: diamond drill hole details for drilling at Limon

Drill Hole Number	Start date (dd/mm/year)	Completion date (dd/mm/year)	Dip (degrees)	Azimuth (degrees)	EOH (m)	Notes
LMDD001	13/4/2019	25/04/2019	-45	28	490.6	
LMDD002	1/05/2019	29/5/2019	-45	180	893.58	
LMDD003	8/08/2019	14/8/2019	-69	200.5	130.48	Abandoned, hole collapse
LMDD004	21/08/2019	8/10/2019	-68	205.5	1063.78	
LMDD005	3/11/2019	19/11/2019	-77	244	289.65	Abandoned, hole collapse
LMDD006	26/11/2019	6/2/2020	-77	244	1212.62	

Table 2: Significant assays from LMDD006

From	То	Interval	Au (g/t)	Cu (ppm)	Comments
0	131.27	131.27	0.17	185	High Sulphidation gold-copper system

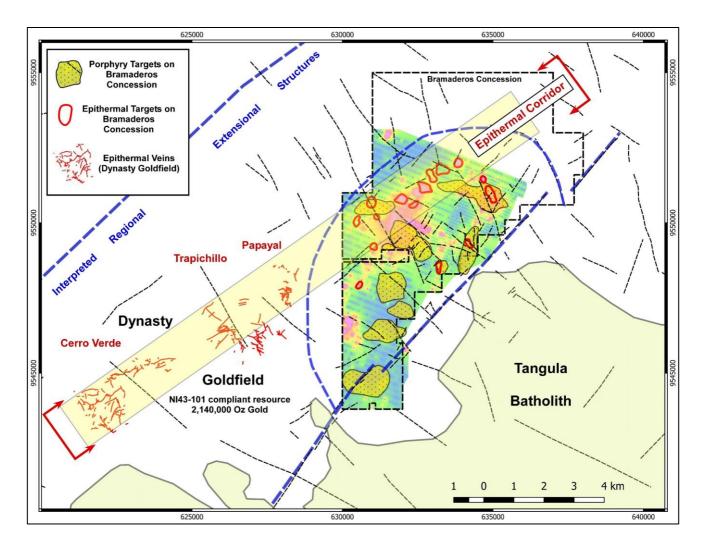


Figure 1: The Bramaderos concession showing the multiple porphyry gold-copper systems and the extension of the 2 million ounce Dynasty Goldfield epithermal belt.

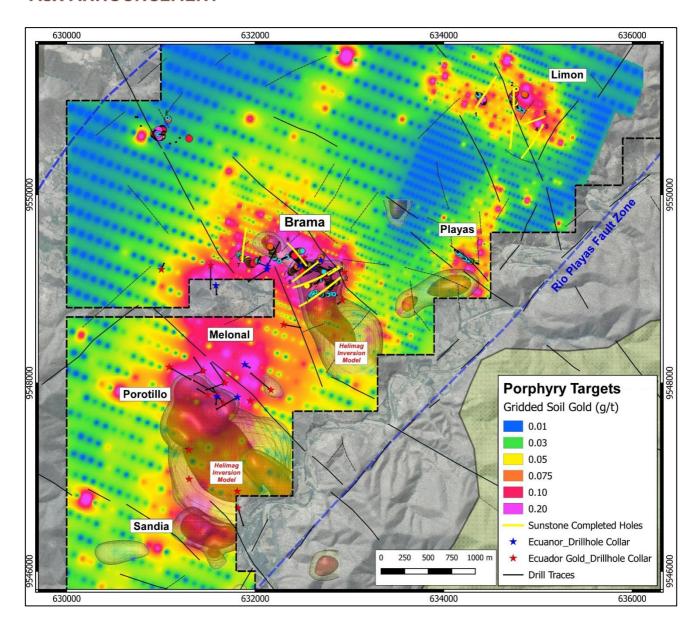


Figure 2: Plan view of the Bramaderos Project porphyry gold-copper targets as defined by gold-in-soil anomalies and magnetic anomalies. The very large Brama target covers outcropping gold-copper mineralisation extending from Brama Hill to the south-east extension of the Brama magnetic anomaly. Five other targets are all mineralised at surface and comprise Limon, Playas, Melonal, Porotillo and Sandia.



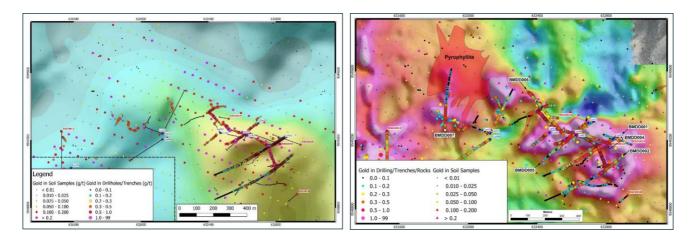


Figure 3: Side by side images of helicopter magnetic survey (left) and more detailed ground magnetic survey at Brama, demonstrating the 'breakthrough' in predicting the geometry of the pipe-like porphyry systems.

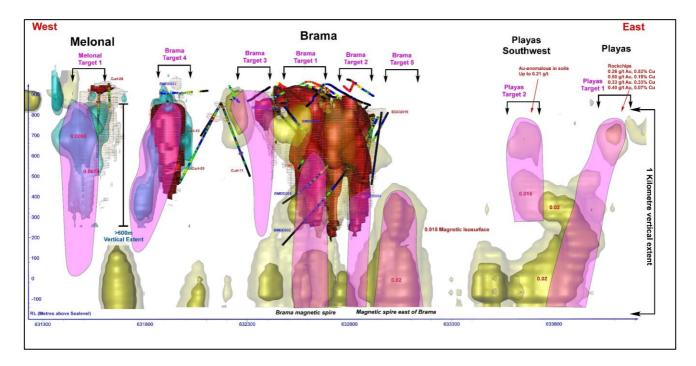


Figure 4: Pipe-like target areas shown in pink over 3-D modelling of discrete magnetic bodies that correspond – where drilled – to higher grade gold-copper porphyry systems. This cluster, across three systems, Melonal, Brama and Playas extends over 2.5km and includes at least 8 targets, all of which have been shown to be mineralised to some extent.



About Sunstone Metals

Sunstone has an advanced portfolio of exploration and development projects in Scandinavia and Ecuador. The portfolio comprises:

- 1. **The Bramaderos Gold-Copper Project** where Sunstone owns an 87.5% interest with TSXV listed Cornerstone Capital Resources holding 12.5% (see ASX announcement dated 10th April 2017, 28th August 2019, and 7 January 2020). The Bramaderos gold-copper project is located in Loja province, southern Ecuador, and is considered to be highly prospective for the discovery of large porphyry gold-copper systems, and high-grade epithermal gold systems. Historical exploration results from drilling at Bramaderos together with recent exploration by Sunstone and joint venture partner Cornerstone Capital Resources (TSXV:CGP) indicate multiple fertile mineralised systems with significant discovery potential.
- 2. **Sunstone has a significant equity** interest of ~27% in Stockholm listed Copperstone Resources (COPP-B.ST) following the recent sale of the Viscaria Copper project.
- 3. The Southern Finland Gold Project includes the Satulinmäki gold prospect. Shallow diamond drilling was completed by the Geological Survey of Finland (GTK) during the period 2000-2005 and this was followed by a 7-hole diamond drilling program by Sunstone Metals in 2016. Intersections from GTK include 18m @ 4.1g/t Au from 50m downhole, including 3m @ 9.3g/t Au, and 4m @ 10.3g/t Au in drill hole R391. Intersections by Sunstone include 23.5m at 3.3g/t in SMDD007 and 2m at 10.5g/t in SMDD005. The Satulinmäki gold prospect is part of an earn-in JV with Canadian company Nortec Minerals, where Sunstone holds an ~82% interest, is funding on-going work, and has also acquired a significant land position, in its own right, in the district.
- 4. **The Scandinavian Lithium Project** includes the Kietyönmäki lithium prospect. Drilling by Sunstone has delivered 24.2m at 1.4% Li₂O in a spodumene-bearing pegmatite. Kietyönmäki is also part of the JV with Nortec Minerals.

Competent Persons Statement

The information in this report that relates to exploration results is based upon information reviewed by Dr Bruce Rohrlach who is a Member of the Australasian Institute of Mining and Metallurgy. Dr Rohrlach is a full-time employee of Sunstone Metals Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Dr Rohrlach consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Mr Malcolm Norris, Managing Director of Sunstone Metals Ltd., has authorised this announcement to be lodged with the ASX.

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APPENDIX 1

The following Table and Sections are provided to ensure compliance with the JORC Code (2012 Edition)

TABLE 1 – Section 1: Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as downhole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	The results announced here are from diamond drill core samples. The sampling was carried out using half core, generally at 2m intervals and where appropriate sampled to 1m intervals.
	• Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	• Core recovery was good, and core aligned prior to splitting.
	• Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 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.	Diamond drilling was used to obtain samples (see first point above) from which the samples were dried, crushed to 70% passing 2mm, Split 1000g and pulverised to 85% passing 75microns. A 20g portion of this sample was used for multi-element analysis (IMS-230) and a 30g sample for Fire Assay Au (FAS-111).
Drilling techniques	Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	The diamond core was drilled delivering either HTW (70.9mm) or NTW (56mm) core. Drill core is oriented using a Reflex ACT II tool for bottom of hole.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Diamond core recovery data for this drilling was measured for each drill run and captured in a digital logging software package. The data has been reviewed and core recovery was approximately 100% throughout.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Core recovery was good, no extra measures were taken to maximise sample recovery.
	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	No relationship between sample recovery and grade has been established.
Logging	Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.	Drill samples were logged for lithology, weathering, structure, mineralogy, mineralisation, colour, geotechnical attributes, and other features. Logging and sampling were carried out according to Sunstone's internal protocols and QAQC procedures which comply with industry standards.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Drill samples are logged for lithology, weathering, structure, mineralogy, mineralisation, colour, geotechnical attributes and other features. Core is photographed both wet and dry.
	The total length and percentage of the relevant intersections logged.	All drill holes are logged in full, from start to finish of the hole.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	 Half core was used to provide the samples that were assayed and reported here. Quarter core samples were taken ~1 in every 28 samples for duplicate sampling. The remaining core is left in the core trays.
p. cparation	• If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Core samples collected.



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Criteria	JORC Code explanation	Commentary
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	 Samples were sent to the LAC y Asociados Cia. Ltda. Sample Preparation Facility in Cuenca, Ecuador for sample preparation. The standard sample preparation for drill core samples (Code PRP-910) is: Drying the sample, crushing to size fraction 70% <2mm and splitting the sample to a 250g portion by riffle or Boyd rotary splitter. The 250g sample is then pulverised to >85% passing 75 microns and then split into two 50g pulp samples. Then one of the pulp samples was sent to the MS Analytical Laboratory in Vancouver (Unit 1, 20120 102nd Avenue, Langley, BC V1M 4B4, Canada) for gold and base metal analysis. The sample preparation is carried out according to industry standard practices using highly appropriate sample preparation techniques.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	 Sunstone used an industry standard QAQC programme involving Certified Reference Materials "standards" and blank samples, which were introduced in the assay batches. Standards (Certified Reference Materials) or analytical blanks were submitted at a rate of 1 in 28 samples. Field duplicates were also taken at a rate of approximately 1 in 28 samples. The check or duplicate assay results are reported along with the sample assay values in the final analysis report.
	Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.	 For diamond core, the routine sample procedure is to always take the half/quarter core to the right of the orientation line (looking down hole) or the cut line (in cases where the orientation line was not reliable). Once assay results are received the results from duplicate samples are compared with the corresponding routine sample to ascertain whether the sampling is representative.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered to be appropriate for the style of sampling undertaken and the grainsize of the material, and correctly represent the style and type of mineralisation at the exploration stage.
Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	 Sunstone uses a fire assay gold technique for Au assays (FAS-111) and a four acid multi element technique (IMS-230) for a suite of 48 elements. FAS-111 involves Au by Fire Assay on a 30-gram aliquot, fusion and atomic absorption spectroscopy (AAS) at trace levels. IMS-20 is considered a near total 4 acid technique using a 20g aliquot followed by multi-element analysis by ICP-AES/MS at ultra-trace levels. This analysis technique is considered suitable for this style of mineralisation.
	 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. 	Data from other measurement tools/instruments are not reported here.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	 Standards, blanks and duplicates are inserted ~1/28 samples. The values of the standards range from low to high grade and are considered appropriate to monitor performance of values near cut-off and near the mean grade of the deposit. The check sampling results are monitored, and



Criteria	JORC Code explanation	Commentary
		performance issues are communicated to the laboratory if necessary.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Procedure checks have been completed by the Competent Person for exploration results for this announcement.
accayg	The use of twinned holes.	Twin holes have not been drilled in this area.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Sunstone sampling data were imported and validated using Excel.
	Discuss any adjustment to assay data.	Assay data were not adjusted. Core loss intervals are assigned assay values of zero where present.
Location of data points	Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.	Sample co-ordinates are located by GPS and measured along the length of the trench.
	Specification of the grid system used.	Southern Ecuador projection parameters:
		Parameter Value
		Reference Ellipsoid International 1924
		Semi Major Axis
		Inverse Flattening (1/f)
		Type of Projection UTM Zone -17S (Datum PSAD56)
		Central Meridian: -81.0000
		Latitude of Origin 0.0000
		Scale on Central Meridian 0.9996
		False Northing 10000000
		False Easting 500000
	Quality and adequacy of topographic control.	The topographic control was compared against published maps and satellite imagery and found to be good quality.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	The samples were collected from one diamond drill hole from the Limon target, and with sample length generally ranging between 1-2m.
	Whether the data spacing, and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	The data from these samples does not contribute to any resource estimate nor implies any grade continuity.
	Whether sample compositing has been applied.	No sample compositing was done.
Orientation of data in relation to geological	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	Drilling orientations were appropriate for the interpreted geology providing representative samples.
structure	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	No sampling bias is expected at this stage. Drilling is at an early stage and there has been no historical drilling on this target.
Sample security	The measures taken to ensure sample security.	Sunstone sampling procedures indicate individual samples were given due attention. Sample security was managed through sealed individual samples and sealed bags of multiple samples for secure delivery to the laboratory by permanent staff of the joint venture. MS Analytical is an internationally accredited



Criteria	JORC Code explanation	Commentary
		laboratory that has all its internal procedures heavily scrutinised in order to maintain their accreditation. MS Analytical is accredited to ISO/IEC 17025 2005 Accredited Methods.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	 Sunstone's and Cornerstone's sampling techniques and data have been audited multiple times by independent mining consultants during various project assessments. These audits have concluded that the sampling techniques and data management are to industry standards. All historical data has been validated to the best degree possible and migrated into a database.

TABLE 1 – Section 2: Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.	The Bramaderos Exploration Concession is located in the Loja Province of southern Ecuador. The concession was granted to La Plata Minerales S.A. ("PLAMIN") in January 2017. PLAMIN is a subsidiary of Sunstone Metals Ltd. The concession is subject to a Joint Venture between Cornerstone Capital Resources Inc. and Sunstone Metals Ltd. There are no wilderness areas or national parks or areas of environmental significance within or adjoining the concession area. There are no native title interests.
	• 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.	The Bramaderos Exploration Concession was granted to La Plata Minerales S.A. ("PLAMIN") in January 2017. PLAMIN is now a subsidiary of Sunstone Metals Ltd. The Bramaderos Concession is subject to a Joint Venture between Sunstone Metals and Cornerstone. Sunstone has an 87.5% interest in the JV.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	• The historic exploration was completed by various groups over the period 1970-1984, 2001-2002 and 2004-2007. Most of the readily available historic data has been acquired and compiled into databases and a GIS project. Exploration by other parties has included stream sediment surveys, geological mapping, rock chip sampling (888 samples) and grid-based soil sampling (1324 samples), trenching and channel sampling (17 trenches), ground magnetic surveys (31 line kilometres), electrical IP surveys and diamond drilling (10426m).
Geology	Deposit type, geological setting and style of mineralisation.	The deposit style being explored for includes intrusion- related and stockwork hosted porphyry Au-Cu systems plus low sulphidation epithermal veins and bulk- tonnage breccia-hosted epithermal gold mineralisation. The setting is a volcanic arc setting of Cretaceous age intrusions.



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Criteria	JORC Code explanation	Commentary
Drill hole Information	 A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: a. easting and northing of the drill hole collar b. elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar c. dip and azimuth of the hole d. down hole length and interception depth e. hole length. If the exclusion of this information is justified on the 	 Details of the samples discussed in this announcement are in the body of the text. Details of historical drill holes are included here and are taken from publicly available NI 43-101 technical reports. See Tables 1 and 2 and Figures 2 & 3 for the location of drill holes. Information included in announcement.
	basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	 Weighted averages were calculated over reported intervals according to sample length. No grade cut-offs were applied.
	• 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.	Intervals were calculated based on interval length multiplied by the metal grade, and then composited over appropriate intervals and averaged over the length.
	• The assumptions used for any reporting of metal equivalent values should be clearly stated.	Metal equivalents are not presented.
Relationship between mineralisation	• If the geometry of the mineralisation with respect to the drill-hole angle is known, its nature should be reported.	• This is the first phase of drilling at this target and the geometry of mineralisation is poorly understood at this stage.
widths and intercept lengths	• If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	The intervals quoted for all drill holes are down hole lengths.
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	See Figures 1-4 for maps showing distribution of samples.
Balanced reporting	Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• Figures 1-4 above show the current interpretations of geology and the location of drill holes.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported) including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Figures 1 -4 above show various datasets that are being used to identify target areas and to guide current and future drilling.
Further work	 The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible 	 The planned exploration program is outlined in the announcement. See Figures 1-4 which show areas for further exploration.
	 Diagrams clearly nighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive. 	See Figures 1-4 which show areas for further exploration.