Orion Minerals NL

ASX/JSE RELEASE: 14 December 2017

Positive initial results received from Airborne EM Survey on the Areachap Belt, Northern Cape, South Africa

- **A 962km² high power SkyTEM airborne EM survey commenced late November 2017.**
- **1510 line km of flights covering 196km² or approximately 20% of target area has been completed.**
- **Four primary and eleven secondary priority targets already identified.**
- **The area being surveyed covers a stratigraphic horizon with 98km combined strike of highly prospective paleo seafloor known to host Zn-Cu VMS occurrences.**
- **The target horizon has not been subjected to modern geophysics and exploration since the 1980's.**

Orion Minerals NL (**ASX/JSE: ORN**) (**Orion** or the **Company**) is pleased to provide an update on its regional exploration activities on the Areachap Belt, in South Africa. Production flights for the helicopter borne magnetic and electro magnetic survey (**AEM** or **SkyTEM**) over the Masiqhame and Disawell Prospecting Rights commenced in late November 2017 (Figure 1) (refer ASX release 16 November 2017). The survey is ongoing, with preliminary results for magnetic and SkyTEM data from the first 1510 line km having been received and reviewed. The survey is succeeding in acquiring high quality data and initial indications are positive for the identification of high priority follow-up targets. Advanced processing is already underway and is expected to assist in target ranking and identification of possible additional, more obscure, anomalies.

The survey is demonstrating the value of applying modern airborne electromagnetic (**EM**) methods, in order to identify key follow-up targets. The Company intends to expand its activities to begin drill testing the highly prospective paleo seafloor for Zn – Cu rich massive sulphide mineralisation in early 2018.

The Areachap Belt was the focus of only two short lived exploration booms in the 1970's and early 1980's (following the discovery of the Prieska Volcanogenic Massive Sulphide (**VMS**) deposit by Anglovaal in 1968), during which, many large exploration companies such as Anglo American, Newmont and Anglovaal were successful in identifying several additional VMS and Ni-Cu occurrences. However, only a few of these VMS occurrences were investigated in detail or below a depth of 300m below surface.

In recent decades, the geological understanding of the style of volcanogenic mineralisation found in the Areachap Belt, has led to numerous global discoveries of clusters of massive sulphide hosted, base metal deposits in "camps" surrounding known major deposits in volcanogenic belts similar to that of the Areachap Belt. The geophysical exploration tools applied to achieve these discoveries have not yet been applied to the highly prospective Areachap Belt.

Details of SkyTEM survey underway

The first flight block over the survey covering the Masiqhame Prospecting Right was completed on 6 December 2017. The SkyTEM survey is being flown with the highly innovative – SkyTEM312 high power technology for deep target imaging. This high power system, with a peak moment up to 1,000,000 NIA, is optimised to provide an exceptional depth of investigation due to the high moment mode with high current and low base frequency of 12.5 Hz.

Readers are invited to visit the Orion Minerals website (www.orionminerals.com.au) to view video imagery of the SkyTEM survey currently underway.

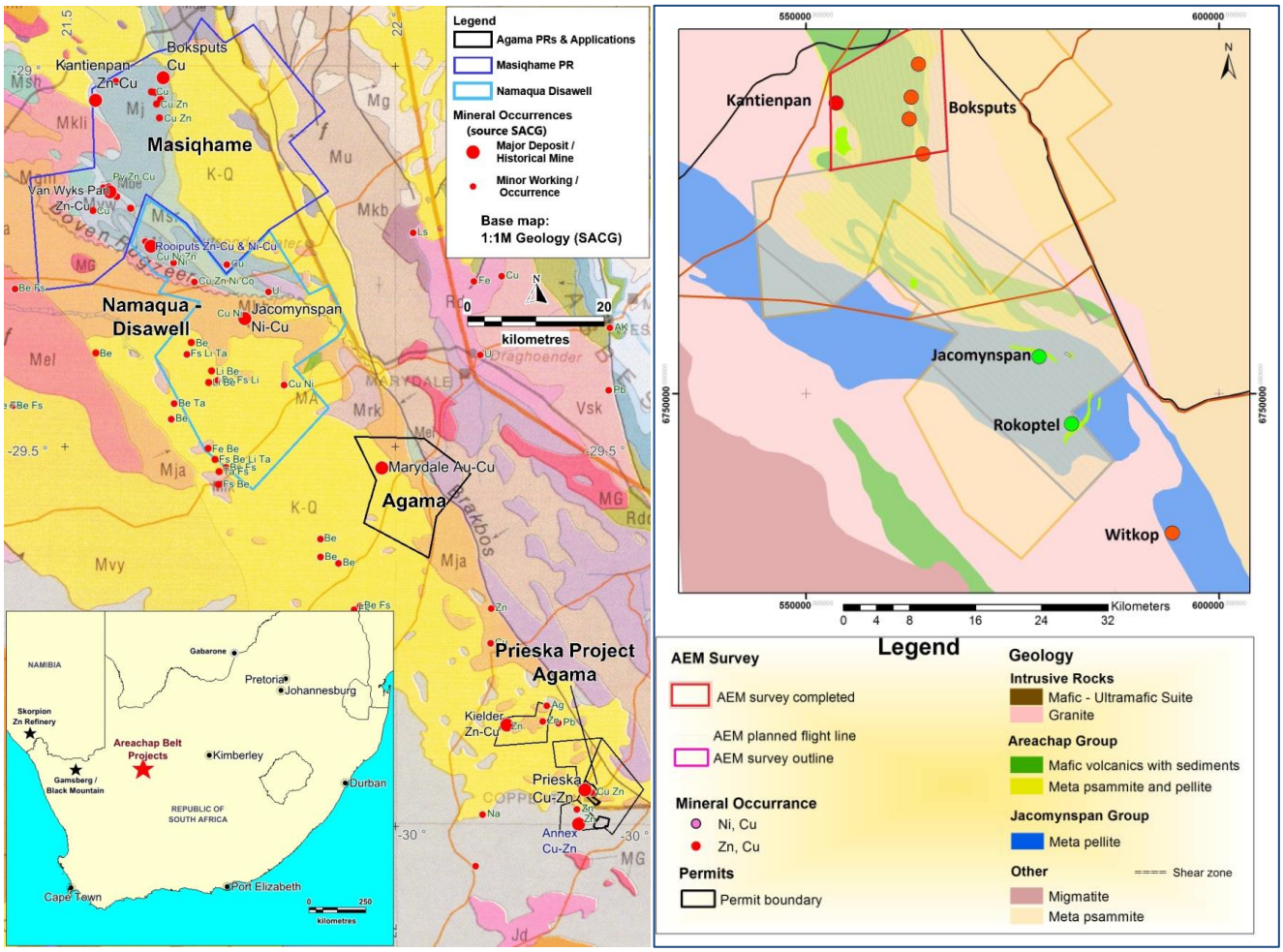

Figure 1: Locality plan for the proposed 962km² SkyTEM (AEM) survey area. The area completed is shown in red. The contact with the geological unit indicated in green on the right hand diagram represents the priority target area.

SkyTEM production flights over Orion's Masiqhame and Disawell Prospecting Rights commenced late in November 2017. The survey is planned for completion in late January 2018. All data is being continually reviewed and processed by Orion's Perth based international expert consultants, Southern Geoscience Consultants.

Four primary (higher priority) and eleven secondary priority AEM anomalies are immediately apparent in data reviewed to date (Figure 2). Encouragingly, nine of the anomalies are spatially associated with the interpreted paleo sea floor. This stratigraphic location significantly elevates the potential of these anomalies to be associated with VMS massive sulphide deposits. Encouragingly, the magnetic signature associated with the seafloor contact is prominent in the high quality magnetic data reviewed and will provide a valuable additional tool in the evaluation of the EM anomalies detected.

Orion plans to follow up selected anomalies with infill AEM and/or high powered ground EM. In addition to the AEM data, the accompanying magnetic data will significantly improve understanding of the geology and structure in this area of poor outcrop (Figure 3).

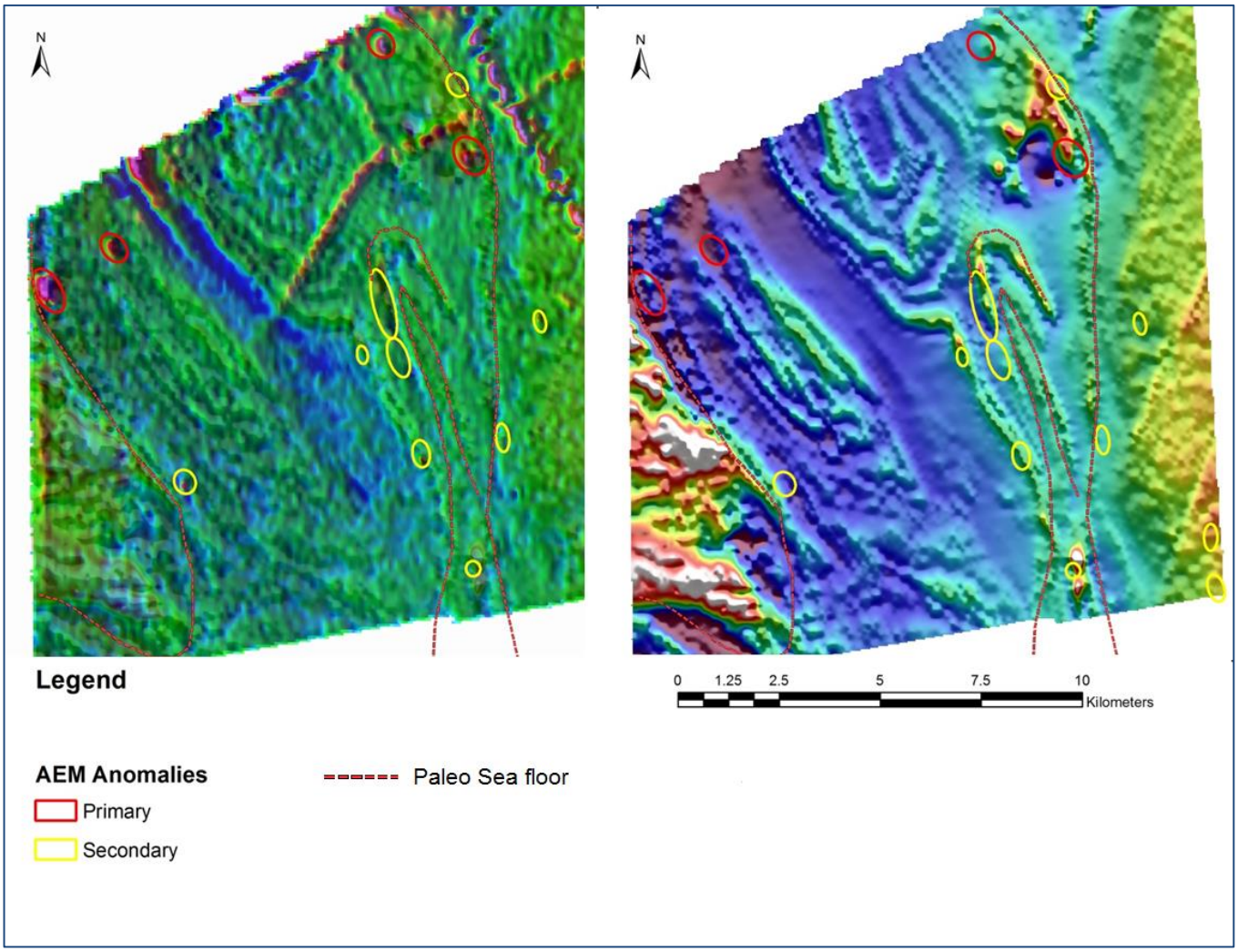

Figure 2: Airborne EM anomalies shown on the AEM Map on the left and the magnetic map on the right.

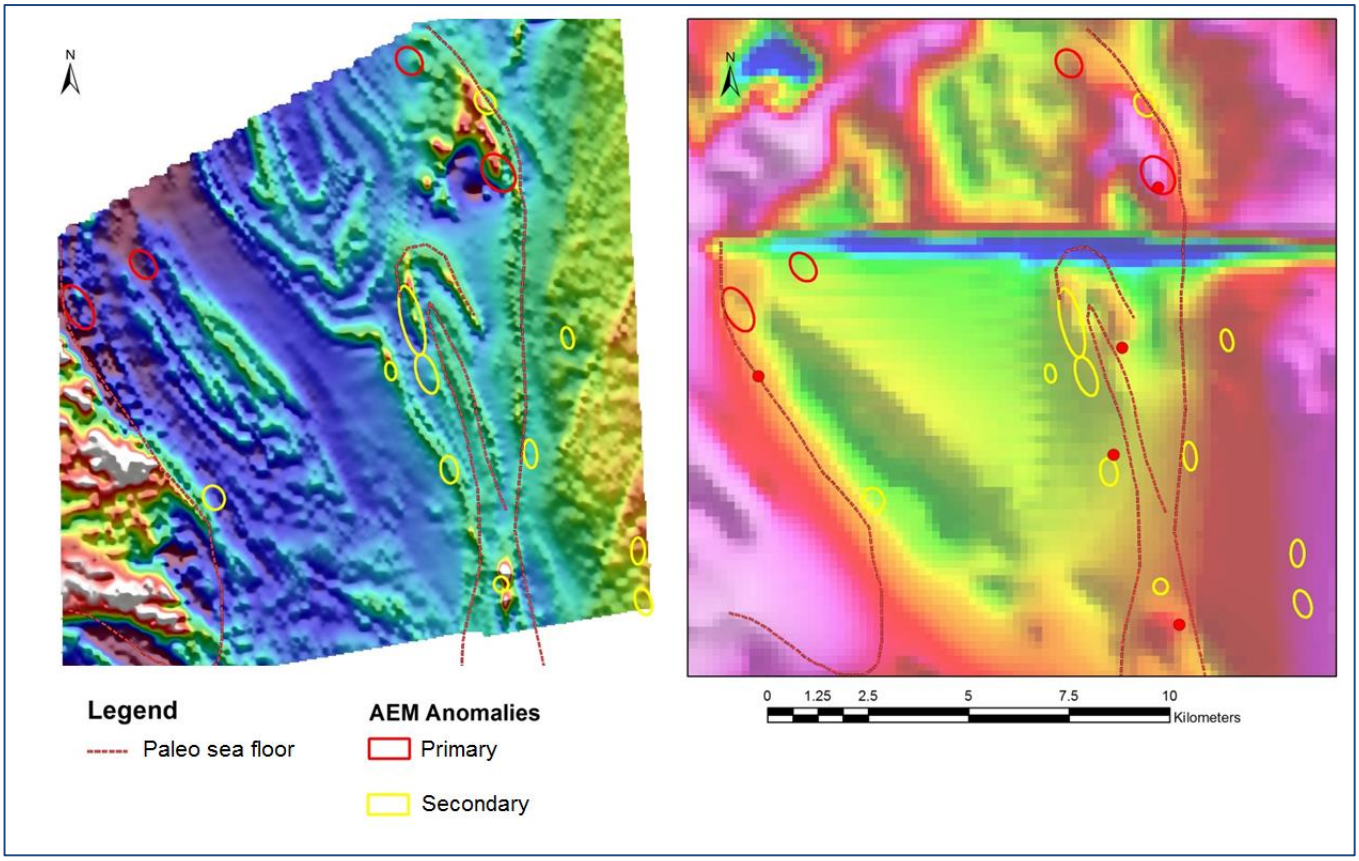

Figure 3: Plans showing the improved newly acquired magnetic data on the left versus historically available airborne magnetic data on the right.

Orion's Managing Director and CEO, Errol Smart, commented:

"The initial results from our advanced airborne survey are extremely encouraging and underscore the exceptional geological potential of this geological belt. The results justify high priority follow-up work and also continued application of these modern techniques, across the highly prospective Areachap Belt. We look forward to drill testing the highest priority targets that we have established, in the new year, while continuing the high intensity BFS work on the Prieska Zn-Cu Project."

Errol Smart
Managing Director and CEO

ENQUIRIES

Investors	Media		JSE Sponsor
Errol Smart – Managing Director & CEO	Michael Vaughan	Barnaby Hayward	Rick Irving
Denis Waddell – Chairman	Fivemark Partners, Australia	Tavistock, UK	Merchantec Capital
T: +61 (0) 3 8080 7170	T: +61 (0) 422 602 720	T: +44 (0) 787 955 1355	T: +27 (0) 11 325 6363
E: info@orionminerals.com.au	E: michael.vaughan@fivemark.com.au	E: orion@tavistock.co.uk	E: rick@merchantec.co.za

Suite 617, 530 Little Collins Street
Melbourne, VIC, 3000

Competent Persons Statement

The information in this report that relates to Orion's Exploration Results at the Areachap Projects complies with the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (**JORC Code**) and has been compiled and assessed under the supervision of Mr Errol Smart, Orion Minerals Managing Director. Mr Smart (PrSciNat) is registered with the South African Council for Natural Scientific Professionals, a Recognised Overseas Professional Organisation (ROPO) for JORC purposes and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the JORC Code. Mr Smart consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears. The Exploration Results are based on standard industry practises for drilling, logging, sampling, assay methods.

Disclaimer

This release may include forward-looking statements. Such forward-looking statements may include, among other things, statements regarding targets, estimates and assumptions in respect of metal production and prices, operating costs and results, capital expenditures, mineral reserves and mineral resources and anticipated grades and recovery rates, and are or may be based on assumptions and estimates related to future technical, economic, market, political, social and other conditions. These forward-looking statements are based on management's expectations and beliefs concerning future events. Forward-looking statements inherently involve subjective judgement and analysis and are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Orion. Actual results and developments may vary materially from those expressed in this release. Given these uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements. Orion makes no undertaking to subsequently update or revise the forward-looking statements made in this release to reflect events or circumstances after the date of this release. All information in respect of Exploration Results and other technical information should be read in conjunction with Competent Person Statements in this release. To the maximum extent permitted by law, Orion and any of its related bodies corporate and affiliates and their officers, employees, agents, associates and advisers:

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- disclaim all responsibility and liability for these forward-looking statements (including, without limitation, liability for negligence).

Appendix 1: The following tables are provided to ensure compliant with the JORC Code (2012) requirements for the reporting of Exploration Results from the Masiqhame Project and Jacomynspan Project (Airborne electromagnetic and magnetic Surveys).

Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (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.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *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 (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.*	• Airborne electromagnetic and magnetic survey at 200m line spacing and 800m tie line spacing carried out by SkyTEM Africa (Pty) Ltd (**SkyTEM**). • Geophysical equipment deployed from a loop underslung from an Airbus AS350 B3 helicopter. • Loop orientation is constantly monitored by two custom-designed Bjerre Technology inclination sensors. • Electromagnetic measurements taken using SkyTEM Dual-Moment, Transient Electromagnetic (**TEM**) System, the 312HP system. • Magnetic measurements taken using Geometrics G822-A cesium vapour magnetometer. • Location of geophysical measurements determined using a Novatel OEMV-1 with DGPS post processing to ensure increased accuracy. • Base station magnetometer installed to measure diurnal variations for use in data processing. Magnetometer used as base station is a GEM GSM 19 Overhauser magnetometer. • Two GPS base station installed to ensure accuracy of locational data. Equipment used is a Novatel OEMV-1. Second base station used as back-up system to ensure continuity. • Measurement height determined by two MDL ACE IM3R laser altimeters mounted on loop. On line navigation conducted using SkyMap and proprietary SkyTEM navigation software.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).*	• Not relevant for this release.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential*	• Not relevant for this release.

Criteria	JORC Code explanation	Commentary
	loss/gain of fine/coarse material.	
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.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Not relevant for this release.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *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.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• Not relevant for this release.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For 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.* • *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.*	• The applied SkyTEM system 312 HP is calibrated at the Danish National Reference site Lyngby. Calibration includes measurements of the transmitter survey data repeated at a range of altitudes at the reference site. Hereby, it is documented that the instrument can reproduce the reference site with the same set of calibration parameters independent of the flight altitude. All processed data are corrected according to the calibration parameters. • A repeat line at the same location is flown once a day to document system repeatability. • The transmitted current should not be less than 220 A at any time on production lines. • The deviation from planned survey lines shall not exceed 50m over a distance of more than 1000m. • Mean terrain clearance of the sensor will not exceed the agreed height by more than ±20m over a distance of more than 1000m. • Base station magnetometer installed to measure diurnal variations for use in data processing. The base station magnetic sensor will be placed in a low magnetic gradient area beyond the region of influence of any man made interference. The sensor is located close to the survey area at a logistically feasible location as determined by SkyTEM. The base station magnetometer will be synchronised with the survey aircraft acquisition system and will be operated during all survey acquisition flights. The diurnal variations will be reviewed in-field

Criteria	JORC Code explanation	Commentary
		on a daily basis. • The magnetic sensor is situated on the carrier (loop) frame away from the aircraft. No compensation of the magnetic data is necessary. • Survey lines are reflown if the magnetometer instrument peak to peak noise (measured as a 4th difference on the raw unfiltered. uncompensated magnetometer signal) of +/-0.1 is exceeded over a distance of more than 5% of the line length or if non-linear diurnal variations between two points separated by 30 secs is greater than 2 nT as measured by the base station magnetometer.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• The acquired electromagnetic and magnetic data will be processed using Skytem's in-house processing and reduction software (SkyLab) as well as Geosoft's Oasis Montaj software. This software allows for full data preprocessing, repeatability and statistical analysis, as well as full quality analysis of the output datasets. • Following reduction of the data, repeatability and QA procedures have been applied to both the positional, electromagnetic and magnetic observations. • QA procedures are applied to all data on a daily basis and any measurements not conforming to contract specifications must be repeated.
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.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Location of flight paths determined using GPS instruments from Novatel with real time SBAS corrections and DGPS post-processing to ensure increased accuracy.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *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.* • *Whether sample compositing has been applied.*	• Aeromagnetic line and tie line spacing is 200m and 800m respectively as this is believed appropriate for the level of precision required to interpret geological features and anticipated geophysical targets in the area.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *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.*	• As per standard industry practice, acquisition lines were flown on headings of 80˚ and 45˚ perpendicular to the strike of the known geology. Tie lines were flown at 90˚ to the acquisition lines.
Sample security	• *The measures taken to ensure sample security.*	• All data acquired by SkyTEM is reported to the Company's representatives.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No audits or reviews have been carried out at this stage beyond standard data Quality Control assessments.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The 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 Masiqhame Prospecting Right is under option earn in agreement to Orion to acquire upto 73% interest, as disclosed in the ASX releases 29 April 2016 and 29 September 2016. • The Namaqua-Disawell Prospecting and Mining Rights is under an earn in option agreement for Orion to acquire upto 80% interest in the joint venture. Details of the agreement is disclosed in the ASX release 14 July 2016.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Previous explorers in the region include Anglovaal, Anglo America, Iscor, Newmont, Gold Field of SA and Africa Nickel. Exploration was aimed at Zn, Cu and Ni.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The tenements are located in the central portion of the Areachap Group on the Eastern Margin of the Namaqua Mobile Belt in South Africa. The Areachap Belt represents a paleo- island arc setting of Protereozoic age. The belt hosts a number of VMS and mafic hosted Ni-Cu style deposits, including the world class Prieska Zn – Cu deposit. • The targets include Ni-Cu-PGE mineralisation hosted within mafic intrusions and VMS deposits.

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:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*
		• Not relevant for this release.

Data aggregation methods	• *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.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.*	• Not relevant for this release.

Criteria	JORC Code explanation	Commentary
	• *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• Not relevant for this release.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• Not relevant for this release.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• Not relevant for this release.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• The Company's previous ASX releases have detailed exploration works including Orion and historical drilling, geological mapping and results of ground EM surveys.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• The Company plans to follow up these results with ground geophysical surveys test targets which may arise from the survey reported here.