Orion Minerals

ASX/JSE RELEASE: 15 November 2021

High-impact diamond drilling commences to test compelling nickel targets at IGO-ORN JV – Fraser Range, Australia

Multiple EM targets to be tested with initial drilling targeting a highly-conductive DHEM anomaly at Hook

- **Logistics and services established to support a substantial diamond drilling program at the highly prospective Pike North, Bilby and Hook (I & II) targets.**
- **The drilling will test down-hole and moving loop EM targets in an area where previous drilling and geochemistry shows high potential for intrusions prospective for nickel and copper.**
- **Diamond drilling underway on the Hook target to test a highly conductive DHEM anomaly.**
- **Hook is located 16km north-east of the confirmed Mawson nickel-copper discovery (Legend Mining).**
- **Mawson has been confirmed as one of the most significant new discoveries in the Fraser Range since Nova-Bollinger, with high-grade massive sulphide intercepts of up to 12.8m at 2.76% Ni and 1.36% Cu from 234.9m reported in diamond hole RKDD008.**

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

"We are really excited to have diamond drilling finally underway in the Fraser Range, with all logistics and services now established by our joint venture partner IGO to support what we all hope could be a game-changing drill program. There is no question that this is one of the hottest exploration districts in Australia at the moment and it is rated very highly by IGO in terms of their global exploration portfolio.

"The results from previous drilling programs provide strong indications that we are in the right place to discover a large magmatic nickel-copper sulphide system, as evidenced by the exciting Mawson nickel-copper discovery just 16km south west of where IGO is now drilling at the Hook prospect. We are now all looking forward with great anticipation to what this program could deliver and we will be keeping a close watch on progress over the coming weeks."

Orion Minerals Limited (**ASX/JSE: ORN**) (**Orion** or the **Company**) is pleased to advise that diamond drilling has commenced to test a number of high-priority magmatic nickel-copper targets within the IGO-ORN Joint Venture tenement E28/2367, located in the Fraser Range Belt of Western Australia (refer Orion ASX / JSE release 23 April 2020).

E28/2367 includes the Pike, Bilby (formerly Pike Eye), Pike North, Hook and Garfish targets, located along trend just 16km north-east of the recently confirmed Mawson nickel-copper discovery (Figure 1) where intersections of massive sulphide, with high-grade including 12.8m at 2.76% Ni and 1.36% Cu from 234.9m reported in diamond hole RKDD008 have been drilled (refer Legend Mining ASX release 21 April 2020).

IGO reported this week that the program has commenced with initial drilling underway at the Hook target. The first hole is progressing steadily and, at the date of this announcement, was well advanced towards a planned final depth of 650m. The hole is designed to test an 18,000S off-hole conductive response identified by a Down-hole Electromagnetic (**DHEM**) survey in previously drilled hole 19AFDD1008, that had intersected amphibole-rich

gabbronorite and meta-gabbronorite zones intercalated with meta-sediment that is locally graphitic (refer Orion ASX / JSE release 3 February 2020).

The intrusive rocks hosting nickel mineralisation at Legend Mining's Area D discovery also occur within a bedded meta-sediment package containing graphitic units.

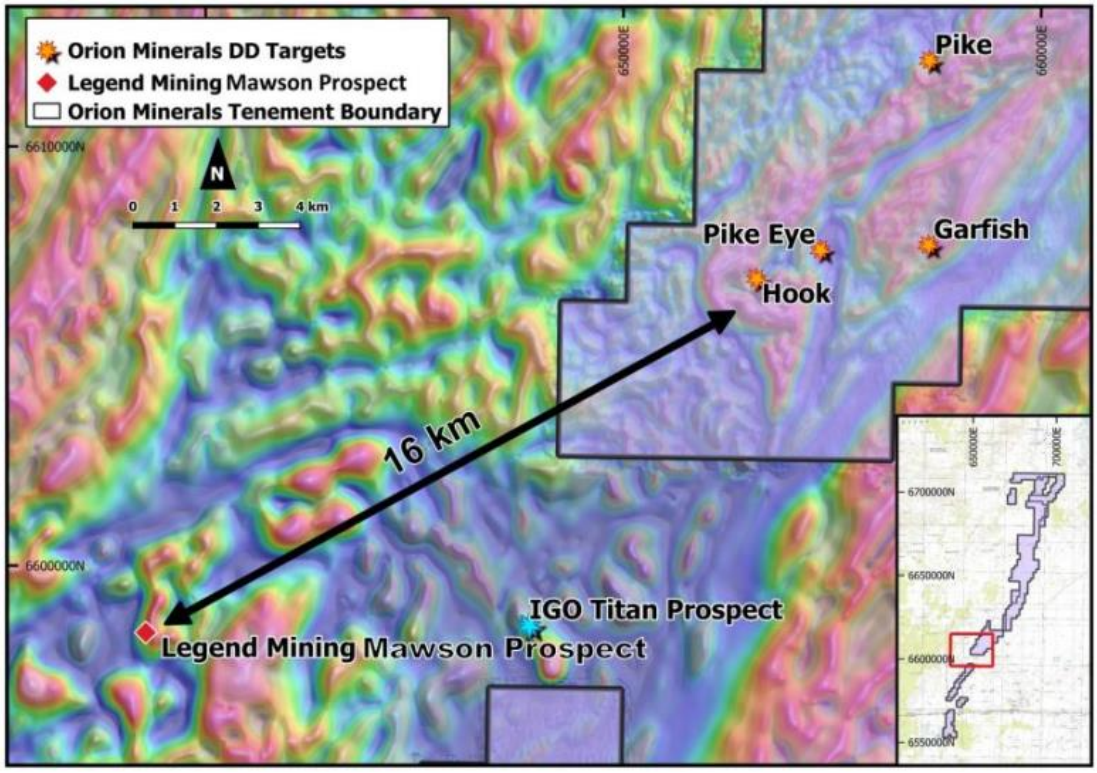


Figure 1: IGO-ORN Fraser Range Joint Venture tenements showing regional aeromagnetic image and locality of the Pike Prospects relative to nearby Legend Mining Mawson Prospect.

The diamond drilling targets have been delineated from previous several moving-loop electromagnetic (**MLEM**) anomalies or DHEM conductors as well as encouraging geochemical results obtained from AC drilling and geophysical inversion modelling. In addition to the current drill hole at Hook, the drill program includes (Figure 2):

- a single diamond hole (600m) at the Hook 2 target, designed to test a 7,000S plate. The previous drilling did not intersect the electromagnetic (**EM**) plate but did intersect basement lithologies consisting of banded graphite and pyrite bearing meta-sediment and meta-gabbronorite. The hole terminated in meta-gabbronorite. The target area also shows a high potential to have prospective intrusion units based on the IGO in-house geochemical and geological index;
- a single diamond hole (340m) designed to intersect a 6,000S EM plate identified by MLEM at Pike North; and
- a single diamond hole (540m) at Bilby (formerly Pike Eye), targeting a discrete EM plate of 7,000S.

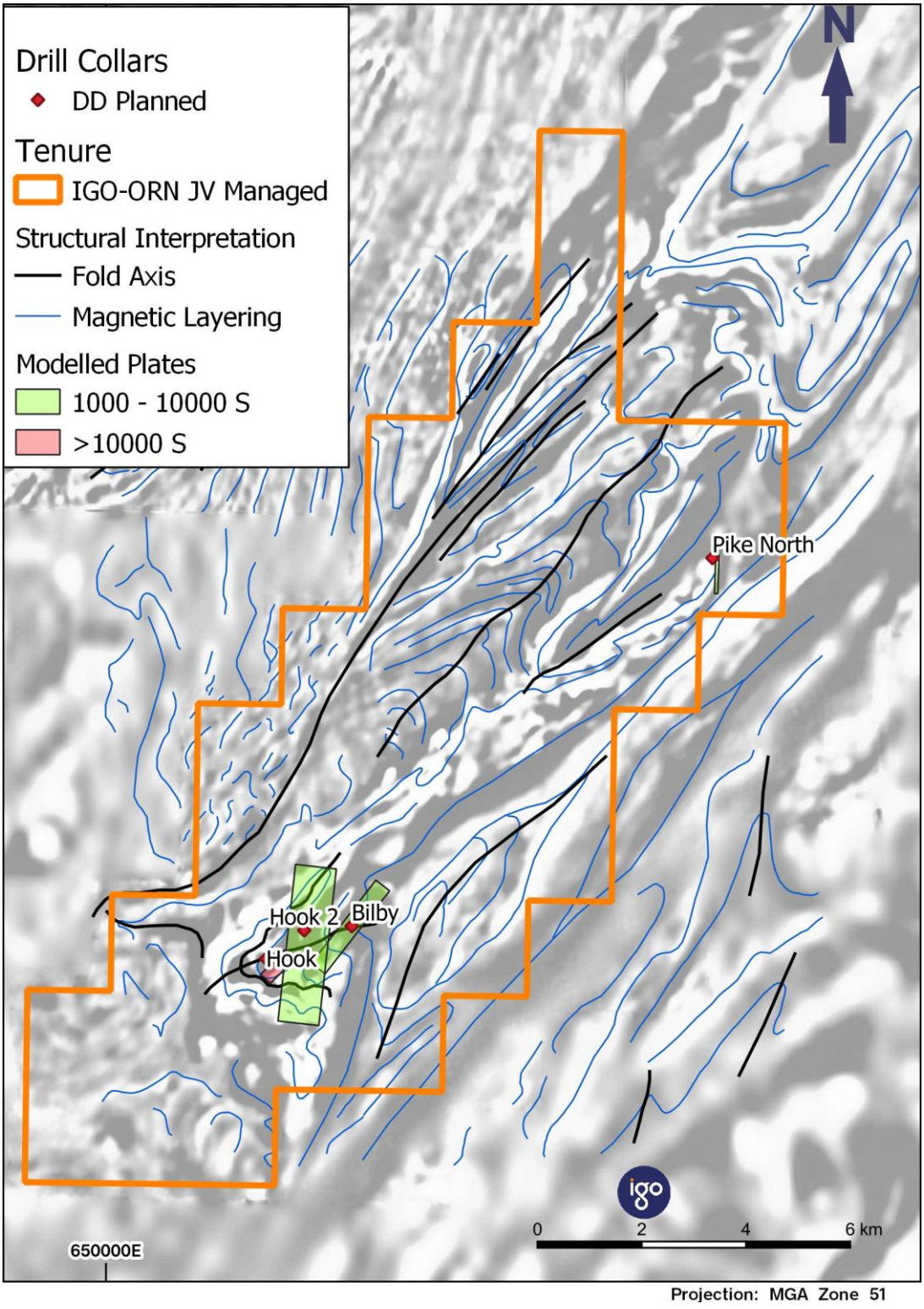
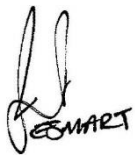


Figure 2: Aeromagnetic map showing the outline of tenement E28/2367 with prospects, interpreted structures, modelled EM plates and planned diamond drilling shown.

For and on behalf of the Board.



Errol Smart
Managing Director and CEO

ENQUIRIES

Investors	**Media**	**JSE Sponsor**
Errol Smart – Managing Director & CEO	Nicholas Read	Monique Martinez
Denis Waddell – Chairman	Read Corporate, Australia	Merchantec Capital
T: +61 (0) 3 8080 7170	T: +61 (0) 419 929 046	T: +27 (0) 11 325 6363
E: info@orionminerals.com.au	E: nicholas@readcorporate.com.au	E: monique@merchantec.co.za

Competent Person Statement

The information in this report that relates to Exploration Results is based on information compiled by Mr Errol Smart (Pr.Sci.Nat.), a Competent Person who is a member of the South African Council for Natural Scientific Professionals, a Recognised Professional Organisation (**RPO**). Mr Smart is the CEO and Managing Director of Orion. Mr Smart 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.

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 (where applicable). 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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Appendix 1: The following tables are provided in accordance with the JORC Code (2012) for the reporting of Exploration Results for Fraser Range Joint Venture Project.

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 (e.g. 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 (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.	• No intersections were reported in this release.
Drilling techniques	• *Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).*	• Diamond drill holes are being drilled by truck mounted rigs owned and operated by Frontline Drilling Australia Pty Ltd. • Holes are collared from surface with PQ-core (85mm diameter) or PQ rock-rolled, which was then reduced to HQ-core (63.5mm diameter) and subsequently NQ2-core (50.6mm diameter) at depths directed by the IGO geologist. • All HQ and NQ core is oriented using REFLEX ACT III-H or N2 Ezy-Mark orientation tools.

Criteria	JORC Code explanation	Commentary
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 loss/gain of fine/coarse material.*	• For recovery checking and orientation marking purposes, the diamond drill core is reconstructed into continuous runs in an angle iron cradle. • Diamond drill recoveries are quantified as the ratio of measured core recovered length to drill advance length for each core-barrel run. • Down hole depths are checked against the depth recorded on the core blocks, and rod counts were routinely carried out and marked on the core blocks by the drillers to ensure the marked core block depths were accurate.
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.*	• Qualitative logging of diamond drill core includes lithology, mineralogy, mineralisation, structures, weathering, colour and other features of the samples. • Quantitative logging is completed for geotechnical purposes. • The total lengths of all drill holes are logged. • The logging is considered adequate to support any downstream estimation, mining and/or metallurgical studies.
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.*	• The diamond drill core is generally subsampled into half-core using an automated wet-diamond-blade core saw. Exceptions are for duplicate samples of selected intervals, where quarter-core subsamples are cut from the half-core. All samples submitted for assay are selected from the same side of the core. • The primary tool used to ensure representative drill core assays is monitoring and ensuring near 100% core recovery. • Laboratory sample preparation of the diamond drill core involves oven drying (4-6 hrs at 95°C), coarse crushing in a jaw-crusher to 100% passing 10 mm, then pulverisation of the entire crushed sample in LM5 grinding robotic mills to a particle size distribution of 85% passing 75 microns, and collection of a 200g sub-sample. • Quality control procedures involve insertion of certified reference materials (**CRMs**) and blanks at the pulverisation stage, and collection and submittal of quarter-core field duplicates.

Criteria	JORC Code explanation	Commentary

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 (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established*
		• Bureau Veritas Perth does sample preparation checks for particle size distribution compliance as part of routine internal quality procedures to ensure the target particle size distribution of 85% passing 75 microns was achieved in the pulverisation stage.
		• Field duplicates, CRMs and blanks are routinely inserted at frequencies between 1:10 and 1:20 samples.
		• Laboratory quality control processes include the use of internal lab standards using CRMs, blanks, and duplicates.
		• CRMs used to monitor accuracy have expected values ranging from low to high grade and the CRMs are inserted randomly into the routine sample stream to the laboratory.
		• Following sample preparation and milling, all diamond drill core samples are analysed for a 63-element suite:
		  ○ Fire assay of 40g charge with ICPMS finish – Au, Pd, Pt.
		  ○ Laser ablation of fused bead with ICPMS finish – Ag, As, Be, Bi, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ge, Hf, Ho, In, La, Lu, Mn, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Re, Sb, Sc, Se, Sm, Sn, Sr, Ta, Tb, Te, Th, Tl, Tm, U, V, W, Y, Yb, Zn, Zr.
		  ○ XRF analysis of powder fused with lithium borate flux including 5% NaNO3 – Al, Ba, Ca, Fe, K, Mg, Na, P, S, Si, Ti.
		  ○ Any intervals reporting >2000ppm Co, Cu, Ni or Zn were also analysed by XRF of powder fused with lithium borate flux including 5% NaNO3 – these XRF analyses were used in preference to LA-ICPMS for calculations of mineralised intervals.
		• Loss on ignition is determined by robotic thermo gravimetric analysis at 1000°C.

Portable XRF Analysis	• *Instrument used, methodology applied, QC protocols and usage/applicability of the data.*	• No portable XRF analysis were reported.

Criteria	JORC Code explanation	Commentary
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.*	• Significant intersections were checked by senior IGO geological personnel. • No twinned holes have been completed to date, in this program. • Logging is validated by an IGO on-site geologist and compiled into the IGO acQuire SQL drill hole database by IGO's Geological Database Administrator. • Assay data is imported directly from the digital assay files provided by the contract analytical company Bureau Veritas Perth and are merged into IGO's acQuire SQL database by IGO's Geological Database Administrator. • Data is backed up regularly on off-site secure servers. • There have been no adjustments to the assay data.
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.*	• Surface hole collar locations are determined using either a Leica GPS1200 (expected accuracy is better than ±0.25m for all three dimensions) or a handheld Garmin GPS unit and averaging for 90 seconds with an expected accuracy of ±6m for easting and northing. • Drill path gyroscopic surveys are completed at either 10m or 12m intervals down hole using a north seeking REFLEX GYRO SPRINT-IQ. • The grid system is GDA94 Zone 51.
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.*	• The drilling is for exploration purposes and targets conductive plates generated from surface geophysics (moving loop EM). • Samples have been composited using length-weighted intervals for public reporting.
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.*	• Drilling from surface is designed to cross the conductive plate targets at a high angle.

Criteria	JORC Code explanation	Commentary
	• *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.*	• True-widths of the intervals are yet to be determined and all reported widths are intersection widths. • The possibility of bias in relation to orientation of geological structure is currently not known.
Sample security	• *The measures taken to ensure sample security.*	• The chain-of-sample custody is managed by IGO staff. • Samples are stored at IGO's currently active mine site designated the Nova Operation (**Nova**). The drill core was cut and sampled at Nova by IGO staff and contractors. • Samples are placed in pre-numbered calico bags and further secured in green plastic sample bags with cable ties. The samples are further secured in a bulk bag and delivered to Bureau Veritas Perth by freight contractor McMahon Burnett. • A sample reconciliation advice is sent by Bureau Veritas Perth to IGO's Geological Database Administrator on receipt of the samples. • Sample preparation and analysis is completed at the laboratory of Bureau Veritas Perth. • The risk of deliberate or accidental loss or contamination of samples is considered very low.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No specific external audits or reviews have been undertaken at this stage of the program.

Section 2 Reporting of Exploration Results

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

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td>Mineral tenement and land tenure status</td><td>• 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.</td><td>
<table>
<tr><th>Exploration Licence</th><th>Expiry Date</th><th>Details JV Manager</th><th>JV % holding</th></tr>
<tr><td>E28/2367</td><td>06/05/2025</td><td>IGO/Orion</td><td>IGO 70%
Orion 30%</td></tr>
</table>
</td></tr>
<tr><td>Exploration done by other parties</td><td>• Acknowledgment and appraisal of exploration by other parties.</td><td>• Previous work on the tenements consisted of aeromagnetic/radiometric and DTM Aeromagnetic / Radiometric / DTM surveys, soil sampling, geological mapping, ground EM survey.
• There has been previous sporadic air core, RC and diamond drilling conducted.</td></tr>
<tr><td>Geology</td><td>• Deposit type, geological setting and style of mineralisation.</td><td>• The region is considered by IGO and Orion to have the potential to host mafic or ultramafic intrusion related Ni-Cu-Co deposits based on the discovery of Nova-Bollinger Ni-Cu-Co deposit and volcanic massive sulphide deposit based on IGO's Andromeda exploration prospect.</td></tr>
<tr><td>Drill hole Information</td><td>• 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.</td><td>• No significant intercepts were reported. Historic holes drilled on E28/2367 are listed below.
<table>
<tr><th>Hole ID</th><th>Easting</th><th>Northing</th><th>Dip</th><th>Azimuth</th><th>Target Depth</th><th>EOH</th><th>Start Date</th><th>End Date</th><th>Prospect</th></tr>
<tr><td>19AFDD1008</td><td>653185</td><td>6606845</td><td>-75</td><td>135</td><td>280m</td><td>465.4m</td><td>9/10/2019</td><td>21/10/2019</td><td>Hook 1</td></tr>
<tr><td>19AFDD1009</td><td>657350</td><td>6610010</td><td>-75</td><td>150</td><td>330m</td><td>334.1m</td><td>27/10/2019</td><td>5/11/2019</td><td>Pike 1</td></tr>
<tr><td>19AFDD1010</td><td>653745</td><td>6607230</td><td>-75</td><td>135</td><td>200m</td><td>238.5m</td><td>6/11/2019</td><td>10/11/2019</td><td>Hook 2</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td>Data aggregation methods</td><td>• 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.
• 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.
• The assumptions used for any reporting of metal equivalent values should be clearly stated.</td><td>• No significant drill hole intercept is reported in this release.</td></tr>
<tr><td>Relationship between mineralisation widths and intercept lengths</td><td>• 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 (e.g. 'down hole length, true width not known').</td><td>• No significant drill hole intercept is reported in this release.</td></tr>
<tr><td>Diagrams</td><td>• 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.</td><td>• No significant intercepts is reported in this release.</td></tr>
<tr><td>Balanced reporting</td><td>• 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.</td><td>• Geochemical results reported does not refer to significant intervals of mineralisation.</td></tr>
<tr><td>Other substantive exploration data</td><td>• 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.</td><td>• A surface EM survey and downhole EM surveys have identified three-dimensional geophysical targets, the location of which are included in the diagrams in the body of this release. Equipment used for surface EM are tabulated below.
<table>
<tr><td>Configuration</td><td>DH</td></tr>
<tr><td>Loop Size</td><td>200m</td></tr>
<tr><td>Line spacing</td><td>200m</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>Station Spacing</td><td>100m</td></tr>
<tr><td>Total line kms</td><td>125.6</td></tr>
<tr><td>Receiver system</td><td>Smartem24
EMIT Fluxgate – Bz (up), Bx (east or 135 as appropriate), By (north or 315 as appropriate)</td></tr>
<tr><td>Sensor location</td><td>200m east or south east of Loop Centre as appropriate</td></tr>
<tr><td>Transmitter</td><td>IGO TEX 2/3</td></tr>
<tr><td>Effective current</td><td>~100A</td></tr>
<tr><td>Frequency</td><td>1Hz</td></tr>
</table>
The planned specifications for downhole EM are tabulated below.
<table>
<tr><td>Configuration</td><td>DHEM</td></tr>
<tr><td>Loop Size</td><td>400m x 400m</td></tr>
<tr><td>Station Spacing</td><td>Nominal 10m</td></tr>
<tr><td>Receiver system</td><td>EMIT Digi Atlantis
3-Component DHEM Probe</td></tr>
<tr><td>Transmitter</td><td>IGO TEX 2/3 or DRTX-e (confirmed after logging)</td></tr>
<tr><td>Effective current</td><td>~60A (confirmed after logging)</td></tr>
<tr><td>Frequency</td><td>TBA (confirmed after logging)</td></tr>
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<tr><td>Further work</td><td>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 extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</td><td>Further drilling is planned to test the conductive plates generated from the EM surveys.</td></tr>
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