Orion Minerals NL

# High grade assay results received for massive sulphide drilling at Prieska Zinc-Copper Project

**Highlights:**

- **Assay results confirm the presence of high grade massive sulphides at the Deep Sulphide Target;**
- **OCOD048 intersected 22.45m of sulphides grading at 5.33% Zn, 1.34% Cu, 0.26g/t Au and 10.60g/t Ag from 1060m down hole depth, including a high grade zone of 5.7m at 10.89% Zn;**
- **The hole successfully twinned historic drill hole F2007 and represents the first step in the validation process of the extensive historical drilling database;**
- **First deflection hole from OCOD048 is underway to test mineralisation on dip and strike from hole OCOD048; and**
- **Orion is on target to complete the maiden JORC compliant Mineral Resource estimate for the Deep Sulphide target by Q1 2018.**

Orion Minerals NL (**ASX: ORN**) (**Orion** or **the Company**) is pleased to announce the assay results from the maiden Orion drill hole into the Deep Sulphide Target at its Prieska Zinc-Copper (**PC**) Project in South Africa. Assays from drill hole OCOD048 returned 22.45 metres (**m**) at 5.33% Zn, 1.34% Cu, 0.26g/t Au and 10.60g/t Ag from 1060m (refer Figures 1 and 2, Appendix 1 and Appendix 2).

Drilling to further extend and validate the mineralisation previously reported and along strike is continuing with a further six holes currently in progress (Figures 3 and 4). The program (refer ASX release 9 May 2017) is designed to systematically test and confirm the extensive historical drilling data (refer ASX release 18 November 2015) with the aim of underpinning a maiden JORC compliant Mineral Resource estimate by Q1 2018. This will be fed into the recently commenced Bankable Feasibility Study (refer ASX release 11 July 2017).

**Orion's Managing Director and CEO, Errol Smart, commented on the result:**

*"The high grade assay results are the first step in the validation of the Prieska Zinc-Copper Project's historical drill database and pleasingly confirm Orion's due diligence process. We continue to rapidly progress the de-risking process at Prieska as we validate the historical database and target upside opportunities to further enhance the prospective returns for all stakeholders."*

**ASX Code:** **ORN**

**Issued Capital:**

Ordinary Shares: 917M

Options: 217M

**Directors:**

**Denis Waddell**
Chairman

**Errol Smart**
Managing Director, CEO

**Bill Oliver**
Technical Director

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**Discussion of maiden Orion Deep Sulphide Target drill hole OCOD048 and assay results**

OCOD048 was Orion's first drill hole to reach target depth at the Deep Sulphide Target (refer ASX Release 29 June 2017). The Deep Sulphide Target is the down-dip extension to mineralisation previously mined at the historic Prieska Zinc-Copper Mine, which is the cornerstone of Orion's development strategy. Deflection hole drilling is underway on OCOD048 to further test the mineralisation in this area.

Individual samples within the intersection are noted to have specific gravity (**SG**, or bulk density) ranging from 2.75 and 4.11 (Appendix 2). Orion's geostatistical consultants have recommended that drill intersections are best stated using weighted grades that are averaged using weighting by both specific gravity and sample length. This method is more representative for mineralised intersections with high internal variability in SG and provides a more accurate characterisation of the likely grade in a mining scenario. Orion has adopted this reporting convention with the reported intersection of 22.45m at 5.33% Zn, 1.34% Cu, 0.26g/t Au and 10.60g/t Ag.

OCOD048 successfully twinned hole F2007 drilled from underground in 1981 by the previous operators of the historic Prieska Zinc Copper Mine (Figure 2). F2007 is 8m along strike (southeast) of OCOD048 and intersected 19.39m of mineralisation grading at 3.60% Zn and 1.38% Cu (ASX release 18 November 2015) on a length only weighted basis. The historical intersections were stated on a length weighted basis and individual sample SG values are not available for all samples. On a like for like basis the OCOD048 intersection would be calculated as 22.45m at 4.98% Zn, 1.33% Cu, 0.26% Au and 10.86g/t Ag on a length weighted basis.

The OCOD048 sulphide intersection is predominantly pyrite and pyrrhotite with sphalerite and chalcopyrite mineralisation and is consistent to the sulphides reported in historical drill logs (Figure 1). Of note are the gold and silver assay results from OCOD048 (refer Appendix 2). Previous owners did not routinely analyse for precious metals and the Company will be undertaking metallurgical test work to confirm that gold and silver can be economically extracted and provide additional credits to the concentrate produced.


**Figure 1**: Photograph showing massive sulphides in OCOD048 between 1078m – 1081m.

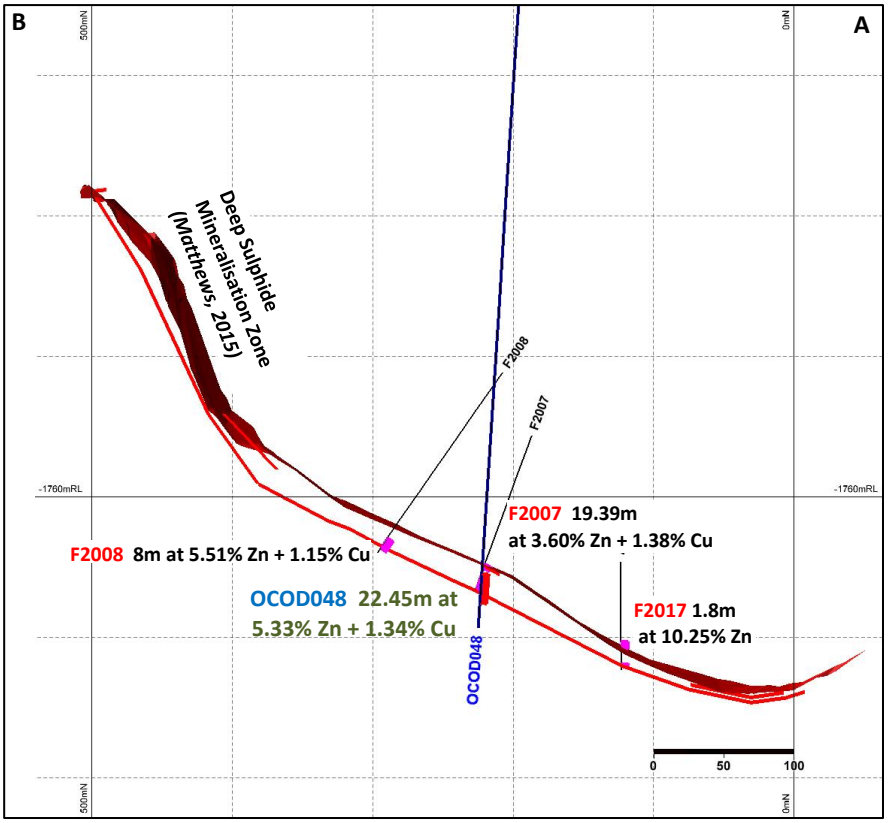


**Figure 2**: Cross Section showing OCOD048 and F2007 as well as interpreted mineralisation (refer Appendix 1 and Appendix 2, ASX release 18 November 2015). Section line shown on Figure 3.

**Further assays pending and forward drilling program**

The second hole to reach the target zone (OCOD052) also successfully intersected massive sulphides, with a 15.15m intersection from 1117m (refer ASX release 11 July 2017). Assay results for this intersection are pending. Significantly, this intersection is over 100m along strike from OCOD048 and represents a substantial extension of interpolated mineralisation at the Deep Sulphide Target (Figure 4) in an area on the north-western margin of the target area, which previously was only drilled on a wide spacing.

Drilling to further extend and validate the mineralisation along strike is currently underway with a further six holes currently in progress (Figures 3 and 4) to systematically test and confirm the extensive historical drilling data. Results are anticipated to provide statistical validation of historic drilling that intersected unmined mineralised zones and add to infill data so that the resultant data spacing meets the requirements for a JORC compliant Mineral Resource estimate.

Orion remains on target to report a maiden JORC compliant Mineral Resource estimate by Q1 2018. This will be fed into the recently commenced Bankable Feasibility Study (refer ASX release 11 July 2017).

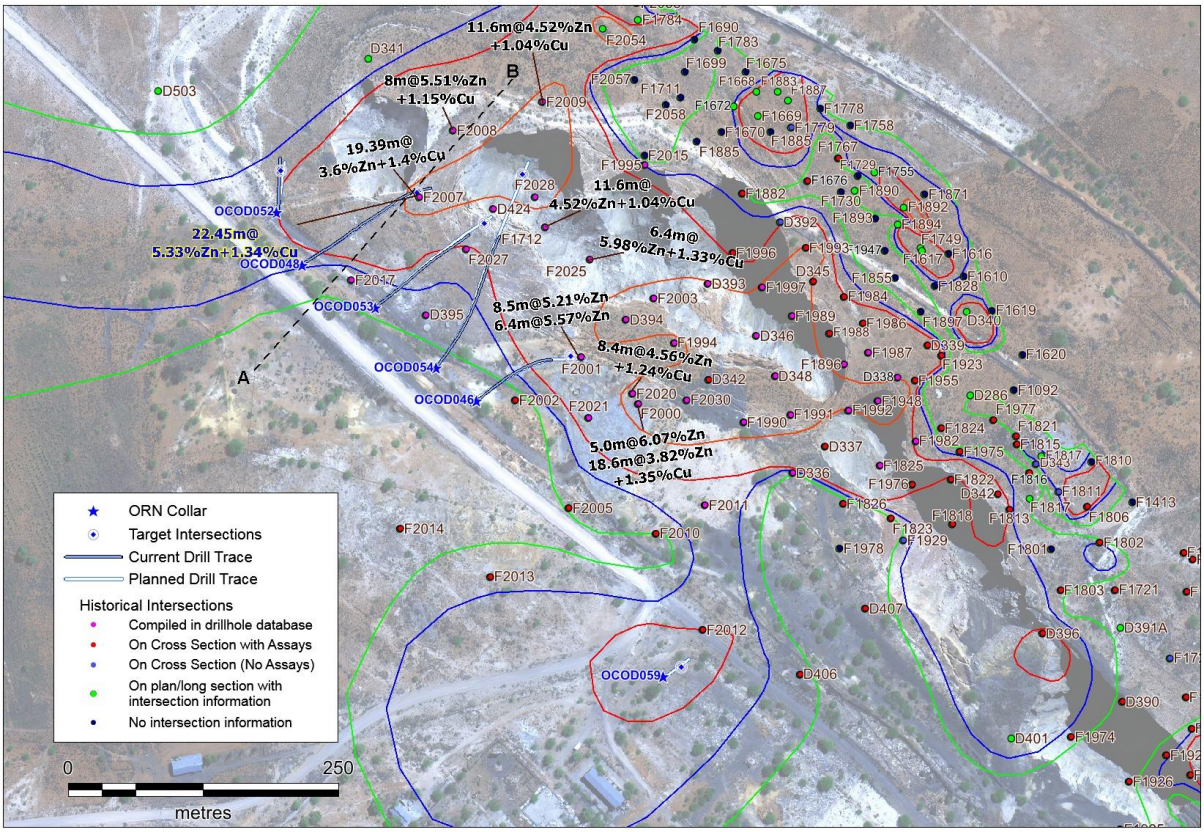


**Figure 3**: Plan showing drilling underway to test the Deep Sulphide Target at the PC Project.

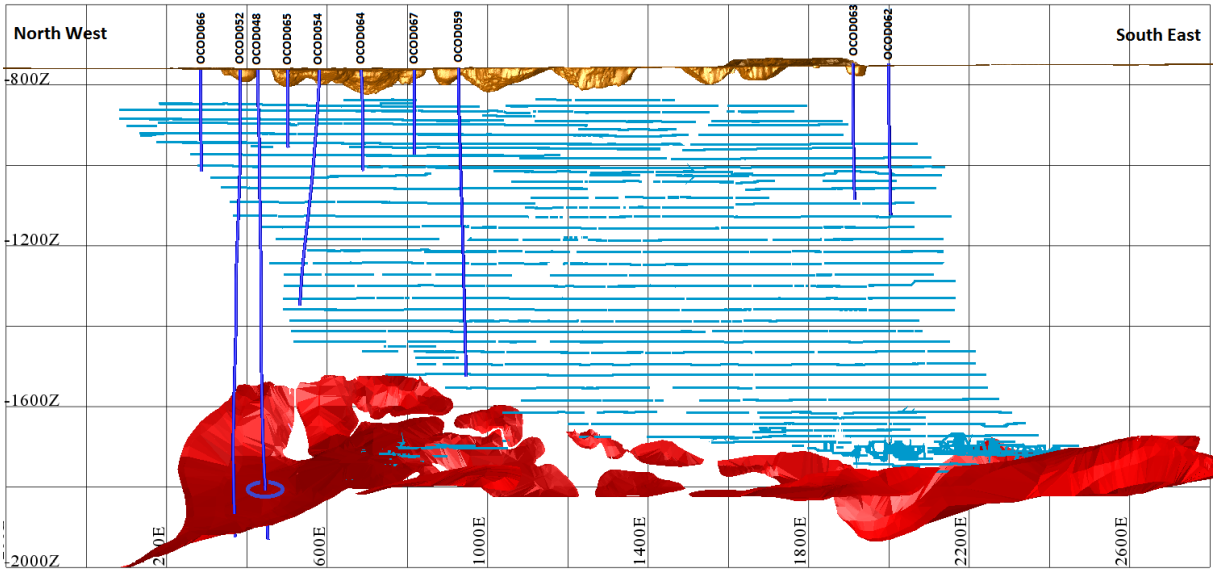


**Figure 4**: Long section looking to the north east showing current drilling, historical development and sinkholes at the PC Project. The intersection in OCOD048 is circled.

Errol Smart
**Managing Director and CEO**

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**About Orion**

Orion Minerals is focused on acquiring, exploring and developing large tenement holdings or regional scale mineral opportunities in world-class mineral provinces. The Company has acquired quality projects in such mineral provinces.

Orion has recently acquired an effective 73.33% interest in a portfolio of projects including an advanced volcanic massive sulphide zinc-copper exploration project with near-term production potential at the Prieska Zinc-Copper Project, located near Copperton in the Northern Cape province of South Africa, and the Marydale Prospecting Right, a virgin gold discovery of possible epithermal origin, located 60 km from the Prieska Zinc-Copper Project. (refer ASX release 30 March 2017).

In addition to the Prieska Zinc-Copper Project and Marydale Gold Project, the Company has entered into options and earn-in rights agreements over a combined area of 1606km$^2$ in the highly prospective Areachap belt, North Cape Province of South Africa (Figure 5). This has secured an outstanding growth and diversification opportunity for the Company. Agreements entered into include:

- An earn in right to ultimately earn a 73% interest in a 980km$^2$ prospecting right area located approximately 80 km north of the Prieska copper Project. The project area contains several VMS and VHMS zinc and copper targets including the advanced stage Kantienpan zinc – copper project. (refer ASX releases 31 May 2016 and 29 April 2016).
- An earn in right to ultimately earn an 80% interest, via a South African registered special purpose vehicle which will be 74% owned by Orion, to prospecting and mining right applications covering a combined and partially overlapping area of 626km$^2$. The mineral rights areas include an advanced stage ultramafic hosted nickel – copper project, analogous to the geology of the Fraser Range, Western Australia. Several VMS and VHMS copper-zinc targets are also located within this mineral rights package. (refer ASX release 14 July 2016).

The Company also continues to explore a large tenement package on the Connors Arc in Queensland, where a significant intermediate sulphidation, epithermal gold and silver system has been identified at Aurora Flats. The project lies between the Cracow and Mt Carlton epithermal deposits. The Company's fieldwork has led to the discovery of substantial epithermal systems at the Veinglorious and Chough Prospects.

The Company also has joint ventures over its Fraser Range Project, which are funded to the completion of pre-feasibility by Independence Group NL (ASX: IGO). The Fraser Range Project consists of a substantial tenement holding in the Albany-Fraser Belt, which hosts Australia's two most significant discoveries of the last decade (the Tropicana Gold Deposit and the Nova Nickel-Copper-Cobalt Deposit). (refer ASX release 10 March 2017).

The Company has an experienced management team with a proven track record in exploration, development and adding shareholder value.

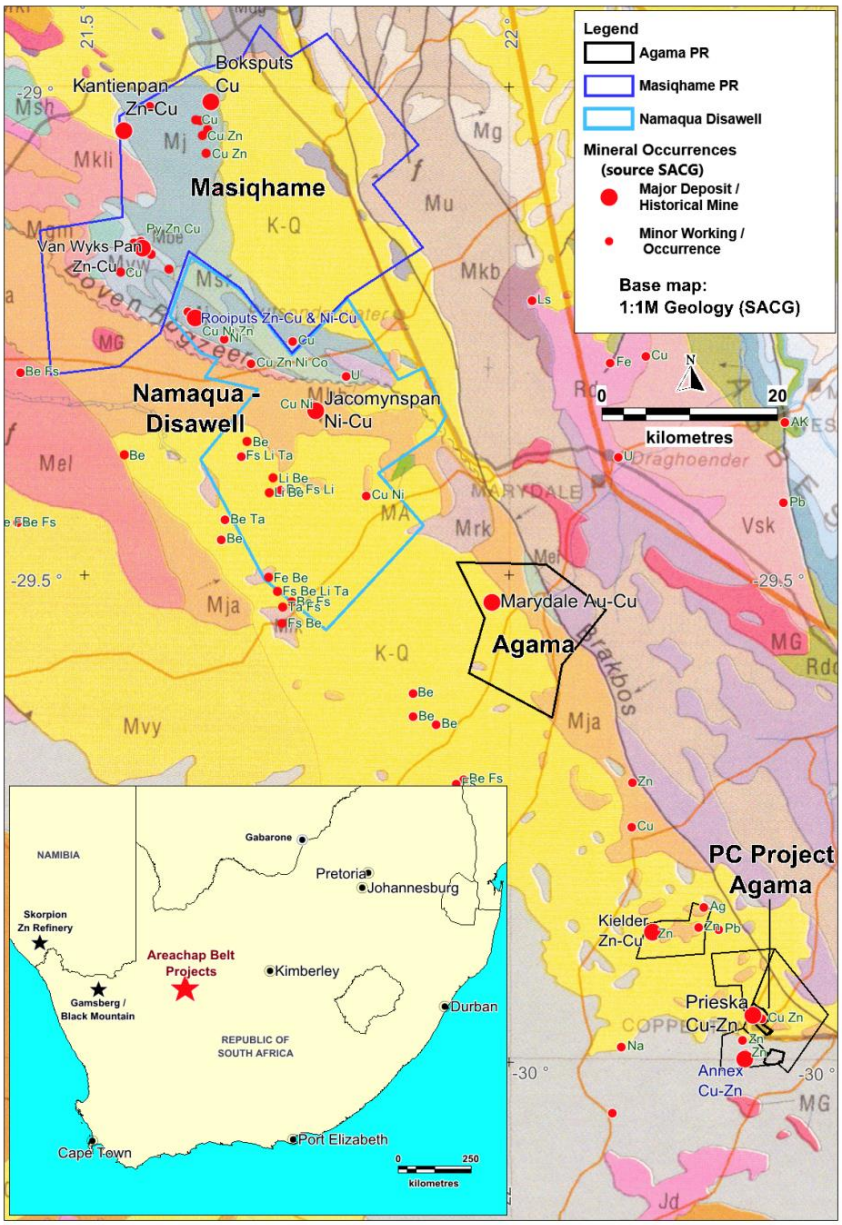


**Figure 5:** Regional geology map of the Areachap Belt showing prospecting rights owned by Orion and currently under option to Orion and noted mineral occurrences as per published data from South African Council for Geoscience.

## Competent Persons Statement

The information in this report that relates to Orion's Exploration Results at the PC Project 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 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 including quality assurance and quality control measure as detailed in Appendix 3.

## 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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- do not make any representation or warranty, express or implied, as to the accuracy, reliability or completeness of the information in this release, or likelihood of fulfilment of any forward-looking statement or any event or results expressed or implied in any forward-looking statement; and
- disclaim all responsibility and liability for these forward-looking statements (including, without limitation, liability for negligence).

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## Appendix 1: Significant Intersections from Deep Sulphide Target drilling at the PC Project.

| Drill hole | Deflection | East (UTMz34S) | North (UTMz34S) | Depth (m) | From (m) | To (m) | Length (m) | Cu (%) | Zn (%) | Au (g/t) | Ag (g/t) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCOD048 | Parent | 624452 | 6686375 | 1179 | **1060.00** | **1082.45** | **22.45** | **1.34** | **5.33** | **0.26** | **10.60** |
| | | | | *including* | **1060.80** | **1066.50** | **5.70** | **0.54** | **10.89** | **0.07** | **3.45** |
| | D1 | From 702m downhole parent | | --- | In Progress – Wedging | | | | | | |
| OCOD052 | Parent | 624419 | 6686406 | 1164 | Completed - Awaiting Assay Results | | | | | | |
| | D1 | From 785m downhole parent | | --- | In Progress – Wedging | | | | | | |
| OCOD054 | Parent | 624576 | 6686282 | --- | In Progress – Core Drilling | | | | | | |
| OCOD057 | Parent | 625446 | 6685138 | --- | In Progress - Precollar Completed | | | | | | |
| OCOD059 | Parent | 624824 | 6686282 | --- | In Progress – Core Drilling | | | | | | |
| OCOD062 | Parent | 625647 | 6685275 | --- | In Progress – Core Drilling | | | | | | |
| OCOD063 | Parent | 625400 | 6685250 | --- | In Progress – Core Drilling | | | | | | |
| OCOD064 | Parent | 624685 | 6686165 | --- | In Progress - Precollar Completed | | | | | | |
| OCOD065 | Parent | 624520 | 6686338 | --- | In Progress – Core Drilling | | | | | | |
| OCOD066 | Parent | 624349 | 6686476 | --- | In Progress – Core Drilling | | | | | | |

1. All intersections > 1m and >0.3% copper or > 0.5% zinc are quoted.
2. New results are shown in bold type.
3. Holes abandoned due to excess deviation or drilling issues are not shown in the table.
4. It is recommended that the supporting information contained in Appendix 3 is read in conjunction with these results.

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**Appendix 2: Drill hole OCOD048 down hole assay and SG results.**

| SAMPLE NUMBER | DEPTH (m) | | SAMPLE LENGTH (m) | SPECIFIC GRAVITY OF SAMPLE | AVERAGE SPECIFIC GRAVITY | Zn (%) | Cu (%) | Au (g/t) | Ag (g/t) |
|---|---|---|---|---|---|---|---|---|---|
| | From | To | | | | | | | |
| OM0050 | 1060.00 | 1060.80 | 0.80 | 3.11 | 3.58 | 5.42 | 0.701 | 0.09 | 12 |
| OM0052 | 1060.80 | 1061.40 | 0.60 | 4.04 | 3.58 | 20.3 | 0.503 | 0.08 | 3 |
| OM0053 | 1061.40 | 1062.00 | 0.60 | 4.11 | 3.58 | 14.60 | 1.17 | 0.09 | 5 |
| OM0054 | 1062.00 | 1063.00 | 1.00 | 4.11 | 3.58 | 13.15 | 0.817 | 0.1 | 6 |
| OM0055 | 1063.00 | 1063.60 | 0.60 | 3.71 | 3.58 | 12.15 | 0.384 | 0.1 | 3 |
| OM0056 | 1063.60 | 1064.50 | 0.90 | 2.75 | 3.58 | 0.09 | 0.07 | 0.02 | 1 |
| OM0057 | 1064.50 | 1065.00 | 0.50 | 2.97 | 3.58 | 4.06 | 0.72 | 0.05 | 3 |
| OM0058 | 1065.00 | 1066.00 | 1.00 | 3.18 | 3.58 | 5.32 | 0.291 | 0.06 | 2 |
| OM0059 | 1066.00 | 1066.50 | 0.50 | 3.99 | 3.58 | 16.20 | 0.301 | 0.11 | 3 |
| OM0060 | 1066.50 | 1067.00 | 0.50 | 2.95 | 3.58 | 2.32 | 0.54 | 0.1 | 2 |
| OM0062 | 1067.00 | 1067.50 | 0.50 | 3.82 | 3.58 | 5.61 | 0.673 | 0.2 | 5 |
| OM0063 | 1067.50 | 1068.10 | 0.60 | 3.24 | 3.58 | 3.20 | 1.175 | 0.19 | 18 |
| OM0064 | 1068.10 | 1069.00 | 0.90 | 3.98 | 3.58 | 4.09 | 0.814 | 0.33 | 6 |
| OM0065 | 1069.00 | 1070.00 | 1.00 | 4.01 | 3.58 | 2.93 | 1.785 | 0.16 | 12 |
| OM0066 | 1070.00 | 1071.00 | 1.00 | 3.67 | 3.58 | 3.55 | 2.56 | 0.27 | 18 |
| OM0067 | 1071.00 | 1072.00 | 1.00 | 3.87 | 3.58 | 1.88 | 3.66 | 0.8 | 24 |
| OM0068 | 1072.00 | 1072.70 | 0.70 | 3.75 | 3.58 | 1.93 | 1.995 | 0.19 | 15 |
| OM0069 | 1072.70 | 1073.50 | 0.80 | 3.30 | 3.58 | 1.95 | 4.02 | 0.73 | 30 |
| OM0070 | 1073.50 | 1074.30 | 0.80 | 3.35 | 3.58 | 2.38 | 6.3 | 1.49 | 47 |
| OM0072 | 1074.30 | 1075.30 | 1.00 | 2.89 | 3.58 | 0.14 | 1.265 | 0.21 | 33 |
| OM0073 | 1075.30 | 1076.00 | 0.70 | 2.90 | 3.58 | 0.08 | 0.516 | 0.22 | 9 |
| OM0074 | 1076.00 | 1076.80 | 0.80 | 2.89 | 3.58 | 0.05 | 0.228 | 0.06 | 2 |
| OM0076 | 1076.80 | 1077.80 | 1.00 | 4.07 | 3.58 | 4.25 | 1.055 | 0.26 | 8 |
| OM0077 | 1077.80 | 1078.80 | 1.00 | 4.00 | 3.58 | 6.80 | 0.56 | 0.08 | 3 |
| OM0078 | 1078.80 | 1079.80 | 1.00 | 3.90 | 3.58 | 6.31 | 1.2 | 0.44 | 7 |
| OM0079 | 1079.80 | 1080.80 | 1.00 | 3.86 | 3.58 | 5.64 | 0.702 | 0.13 | 3 |
| OM0080 | 1080.80 | 1081.80 | 1.00 | 3.77 | 3.58 | 2.53 | 0.913 | 0.14 | 6 |
| OM0082 | 1081.80 | 1082.45 | 0.65 | 3.47 | 3.58 | 3.47 | 0.562 | 0.12 | 3 |

**Appendix 3: The following tables are provided to ensure compliance with the JORC Code (2012) requirements for the reporting of Exploration Results for the PC 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 (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.*<br>• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*<br>• *Aspects of the determination of mineralisation that are Material to the Public Report.*<br>• *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.* | • Diamond core cut at core yard and half core taken as sample.<br>• Diamond core sampled on 1m intervals where possible, sample lengths adjusted to ensure samples do not cross geological boundaries or other features.<br>• Drilling carried out aiming to define an approximate 100m x 100m pattern by use of "mother" holes and deflections from these holes.<br>• Percussion / reverse circulation precollars (where used) sampled on a composite basis.<br>• Mineralised zones are drilled using core drilling.<br>• Sampling carried out under supervision using procedures outlined below including industry standard QA/QC.<br>• Samples submitted for analysis to ALS is pulverized in its entirety at ALS and split to obtain a 0.2g sample for digestion and analysis. |
| ***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).* | • Diamond core drilling using NQ and BQ sized core.<br>• Pre collar drilled using percussion drilling on certain holes (above mineralisation). |
| ***Drill sample recovery*** | • *Method of recording and assessing core and chip sample recoveries and results assessed.*<br>• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*<br>• *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.* | • All mineralised intersections are done with core drilling.<br>• Core stick-ups reflecting the depth of the borehole are recorded at the rig at the end of each core run.<br>• A block with the depth of the hole written on it is placed in the core box at the end of each run.<br>• At the core yard, the length of core in the core box is measured for each run. The measured length of core is subtracted from the length of the run as recorded from the stick-up measured at the rig to determine the core lost. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | • No grade variation with recovery noted. |
| ***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.*<br>• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.*<br>• *The total length and percentage of the relevant intersections logged.* | • All percussion holes are logged on 1m intervals using visual inspection of washed drill chips and both full. Core is logged by geology and recorded between geological contacts by qualified geologists.<br>• Qualitative logging of colour, grainsize, weathering, structural fabric, lithology, alteration type and sulphide mineralogy carried out.<br>• Quantitative estimate of sulphide mineralogy and quartz veining.<br>• Logs are recorded at the core yard and entered into digital templates at the project office. |
| ***Sub-sampling techniques and sample preparation*** | • *If core, whether cut or sawn and whether quarter, half or all core taken.*<br>• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*<br>• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*<br>• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*<br>• *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.*<br>• *Whether sample sizes are appropriate to the grain size of the material being sampled.* | • BQ and NQ core cut at core yard and half core taken as sample.<br>• Samples from percussion pre collars are collected by spear sampling.<br>• Sampling on site aims to generate a < 2kg sub sample to enable the entire sample to be pulverised without further splitting.<br>• Water is used in the dust depression proses during percussion drilling, resulting in wet chip samples.<br>• With core samples, the entire sample length is cut and sampled.<br>• Sample preparation is undertaken at ALS Laboratory Johannesburg, an ISO accredited laboratory. ALS utilises industry best practise for sample preparation for analysis involving drying of samples, crushing to <5mm if required and then pulverising so that +85% of the sample passes 75 microns.<br>• CRM's, blanks and replicates are inserted every 30 samples and analysed with each batch.<br>• Lab supplied CRM's, blanks and replicates are analysed with each batch.<br>• Specific gravity measurements are made over the full length of each individual sample on split core where possible. Where not possible due to crushed or broken core, a minimum of 80% of the core sample is used. The specific gravity is determined by measuring and subtracting the wet weight from the dry weight using an electronic density scale. Care is taken to clean and zero the scale between each weighing.<br>• The sample is first weighed in air and the weight recorded. The sample is then weighed, while completely submerged in clean water within a measuring beaker. The mass of beaker and water are deducted for net submerged weight and volume displacement read on measuring beaker.<br>• The sample is then removed and placed back into the core tray in the |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | correct position and orientation. The procedure is repeated for each geological sample interval.<br>• The data is recorded in the Specific Gravity Data Sheet. The specific gravity is calculated for each sample using the formula:<br>SG = weight of sample / (weight of sample in air minus the weight of the sample in water). |
| ***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.*<br>• *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.*<br>• *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.* | • Samples from drilling were submitted to ALS Chemex in Johannesburg. Samples were analysed for base metals using a four acid digest and ICP-OES and for gold by fire assay with AAS finish.<br>• External quality assurance of the laboratory assays is monitored by the insertion of blanks, duplicates and certified reference materials (**CRM**)<br>• Coarse field duplicates consisting of a split sub-sample of the original crushed sample material.<br>• Three CRMs are alternated through the sample stream and where possible matched to the material being drilled.<br>• Two blanks are used (pulp and chips).<br>• No external laboratory checks have been carried out at this stage. |
| ***Verification of sampling and assaying*** | • *The verification of significant intersections by either independent or alternative company personnel.*<br>• *The use of twinned holes.*<br>• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*<br>• *Discuss any adjustment to assay data.* | • The executive geologist is personally supervising the drilling and sampling along with a team of experienced geologists.<br>• Both the Managing Director and the Technical Director have reviewed the raw laboratory data and independent geologists have confirmed the calculation of the significant intersections. |
| ***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.*<br>• *Specification of the grid system used.*<br>• *Quality and adequacy of topographic control.* | • Collar data has been laid out using a handheld GPS and these coordinates are reported here.<br>• All of the Orion drill hole collars are surveyed by a qualified surveyor using a differential GPS which may result in minor adjustments to coordinate data.<br>• Downhole surveys are completed using a North-Seeking Gyro instrument.<br>• The historic mine survey data is in the old national Clarke 1880 coordinate system. All data is collected the surveyor is in Clarke 1880 and in UTM WGS84 Zone 34 (Southern Hemisphere). UTM WGS84 Zone 34 coordinates are reported above. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| ***Data spacing and distribution*** | • *Data spacing for reporting of Exploration Results.*<br>• *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.*<br>• *Whether sample compositing has been applied.* | • Drill holes aim to intersect mineralisation on approximately 100m x 100m spacing with infill drilling to be carried out in areas of interest as determined by results.<br>• Variography studies were carried out on the historic data set to determine the drill spacing for Mineral Resource estimates. |
| ***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.*<br>• *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.* | • Drilling is oriented perpendicular, or at a maximum achievable angle to, the attitude of the mineralisation.<br>• As a result most holes intersect the mineralisation at an acceptable angle.<br>• Where surface access or geotechnical conditions do not allow access to optimal drill collar positions, holes may be inclined.<br>• The intersections will be corrected once the mineralised zone is modelled in three dimensions and local attitude can be accurately determined.<br>• No sampling bias is anticipated as a result of hole orientations. |
| ***Sample security*** | • *The measures taken to ensure sample security.* | • Chain of custody is managed by the Company. Samples were stored on site in a secure locked building and then freighted directly to the lab. |
| ***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. |

**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.*<br>• *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 Prospecting Right is held by a subsidiary company of Agama Exploration and Mining (Pty) Ltd (**Agama**), which is a wholly owned subsidiary of Orion. As such, Orion effectively holds a 73.33% interest in the project.<br>• The Prospecting Right covers a strike of 2200m for the Deep Sulphide mineralisation out of a total interpreted strike of 2800m.<br>• The Prospecting Right covers the complete known strike of the +105 Level Target.<br>• All of the required shaft infrastructure and lateral access underground development is available within the Prospecting Right. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| ***Exploration done by other parties*** | • *Acknowledgment and appraisal of exploration by other parties.* | <u>Deep Sulphide Target</u><br>• All exploration and life of mine drilling (V, D and F holes) was done by Anglovaal, resulting in a substantial amount of hard copy data from which the Company has been able to assess the prospectivity of the remaining mineralisation.<br>• The Anglovaal exploration resulted in the delineation and development of a large mine.<br><br><u>+105 Level Target</u><br>• The 2012 drilling of the NW section of the +105 Level Target was carried out by the previous owners of the Subsidiary (Orion acquired the subsidiary in March 2017). |
| ***Geology*** | • *Deposit type, geological setting and style of mineralisation.* | • The Copperton deposit is a Volcanogenic Massive Sulphide deposit. The deposit is contained in the Areachap Group, which also hosts the Boks Puts, Areachap, Kielder, Annex Vogelstruisbult and Kantienpan deposits.<br>• The historically mined section of the deposit is confined to a tabular, stratabound horizon in the northern limb of a refolded recumbent synform which plunges at approximately 45° to the southeast. It is hosted within deformed gneisses of the Copperton Formation, which have been dated at 1285 Ma and forms part of the Namaqualand Metamorphic Complex.<br>• The mineralised zone outcrop has a strike of 2400m, was oxidised and or affected by leached and supergene enrichment to a depth of approximately 100m, and outcrops as a well developed gossan. It has a dip of between 55° and 80° to the northeast at surface and a strike of 130° to the north. The width of the mineralised zone exceeds 35m in places but averages between 7m and 9m. The mineralised zone persists to a depth of 1100m (as deep as 1200m in one section) after which it is upturned.<br>• The +105 Level Target area comprises the oxide / supergene / mixed zone (and a zone of remnant primary sulphides) situated from above the upper limit of mining at approximately 100m depth up to surface. |
| ***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:*<br>  ○ *easting and northing of the drill hole collar* | • All Significant Intersections, location data and other drill hole information is tabulated in Appendix 1 and Appendix 2. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*<br>○ *dip and azimuth of the hole*<br>○ *down hole length and interception depth*<br>○ *hole length.*<br>• *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.* | |
| ***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.*<br>• *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.*<br>• *The assumptions used for any reporting of metal equivalent values should be clearly stated.* | • Significant Intersections are calculated by average of assays result > 0.3% copper or 0.5% zinc and weighted by the sample width and specific gravity of each sample. In general the significant intersections correspond strongly to geological boundaries (massive sulphides) and are clearly distinguishable from country rock / surrounding samples. No truncations have been applied at this stage. |
| ***Relationship between mineralisation widths and intercept lengths*** | • *These relationships are particularly important in the reporting of Exploration Results.*<br>• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*<br>• *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').* | • All intersection widths quoted are down hole widths.<br>• Most holes intersected the mineralisation perpendicular or at high angle to the attitude of the mineralisation.<br>• The mineralisation has complex geometry and mineralisation widths need to be estimated based on interpretation of surrounding intercepts. |
| ***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.* | • Appropriate diagrams (plan, cross section and long section) are shown in the announcement text. |
| ***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.* | • All drill holes are listed in Appendix 1, including those with no mineralisation. |
| ***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* | • Hardcopy maps are available for a range of other exploration data. This includes mine survey plans, geological maps, airborne magnetics, ground magnetics, electromagnetics, gravity and induced polarisation. All available exploration data has been viewed by the Competent Person. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | *deleterious or contaminating substances.* | • The mine operated from 1972 to 1991 and is reported to have milled a total of 45.68 Mt of ore at a grade of 1.11% copper and 2.62% zinc, recovering 0.43 Mt of copper and 1.01 Mt of zinc. Detailed production and metallurgical results are available for the life of the mine.<br>• In addition, 1.76 Mt of pyrite concentrates and 8403 t of lead concentrates as well as amounts of silver and gold were recovered.<br>• Copper and zinc recoveries averaged 84.9% and 84.3% respectively during the life of the mine. |
| ***Further work*** | • *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*<br>• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.* | • Drilling is ongoing to test the Deep Sulphide Target with planned holes shown on relevant figures in this release. |