# ASX RELEASE

26 JULY 2017

# JAGUAR VALUE ENHANCEMENT PROGRAMS DEMONSTRATE OPTIONS TO EXTEND MINE LIFE AND IMPROVE PROJECT SCALE

Independence Group NL ('**IGO**' or '**the Company'**) (**ASX: IGO**) is pleased to report the results of value enhancement works recently completed at the Company's wholly-owned Jaguar zinc-copper-silver-gold operation.

## HIGHLIGHTS

- A first Mineral Resource and Ore Reserve has been estimated for the upper lens of the Triumph Deposit with a total:
  - Mineral Resource of 2.2Mt grading 6.2% Zn, 0.5% Cu, 0.5% Pb, 84g/t Ag and 0.3g/t Au.
  - Ore Reserve of 1.2Mt grading 6.2% Zn, 0.4% Cu, 85g/t Ag and 0.3g/t Au.
- A Pre-feasibility Study completed on the Triumph Deposit has confirmed Ore Reserves to extend the Jaguar Operation's mine life to at least to 2022.
- A process plant improvement study has demonstrated opportunities to achieve higher metallurgical recoveries for zinc and copper concentrates and to grow a new revenue stream through production and sale of a new precious metal concentrate.
- At the Bentley mine, a new massive sulphide lens named Bentayga has been discovered, which has a significant drill intersection of 15.5m (true width 9.7m) grading 20.0% Zn, 0.8% Cu, 3.1% Pb, 534g/t Ag and 3.2g/t Au.
- Encouraging air core drilling results from gold exploration at the Heather Bore Gold Prospect have confirmed IGO's plans for further drilling to test gold bedrock anomalies.

IGO's Managing Director, Peter Bradford said, "*The outcomes of the ongoing Jaguar value enhancement programs demonstrate how IGO can not only extend mine life and add value to the asset, but also improve site flexibility and operational performance*."

"*Delivery of Triumph's first Mineral Resource and Ore Reserve estimates confirms an additional ore-source that can supplement Bentley and extend the life of the Jaguar operation to at least 2022. This second mining area would allow the processing plant to reach a full capacity of 600,000 tonnes per year, representing a 20 per cent increase on historic throughputs. We can also realise favourable economics and technical viability by modifying the processing plant to improve copper and zinc recoveries as well as growing a new revenue stream by producing a third concentrate of precious metals*" Mr Bradford added.

"*Furthermore, we continue to reap the rewards of our exploration investment with the significant discovery of the Bentayga massive sulphide lens at Bentley and encouraging gold exploration results at Heather Bore*."

"*IGO will now advance these work programs by pursuing and securing the necessary internal and external approvals to proceed with the Triumph mine development and Jaguar process plant improvements, as well as continue drilling Bentayga and other prospects that offer upside potential*" Mr Bradford said.

## Triumph Deposit

The Triumph zinc-copper-silver-gold deposit, is part of a cluster of Volcanic-Hosted Massive Sulphide (VHMS) deposits located 6km north of the Jaguar processing plant. Triumph is on the same stratigraphic position as the Teutonic Bore, Jaguar and Bentley VHMS deposits (Figure 1).

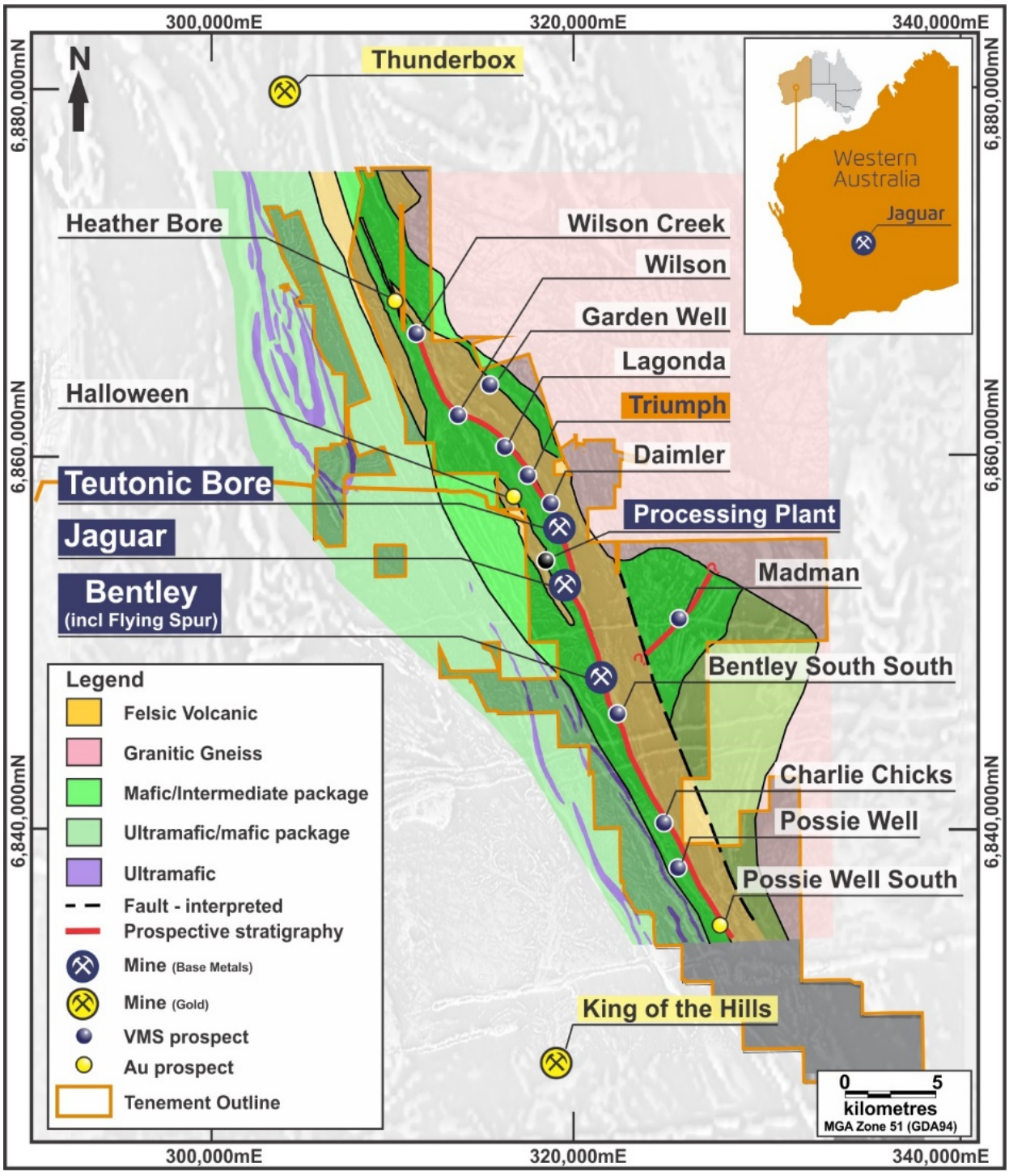


**Figure 1: Jaguar Operations Deposit and Plant Location and Regional Geology Map**

The Triumph deposit contains several massive sulphide lenses. The upper most lens is named the Stag Lens, which has a strike length of ≈350m, a shallow southerly down plunge extent of ≈400m, and a maximum true

thickness of ≈40m. Stag Lens starts ≈170m below the surface and extends ≈400m vertically. Mineralisation remains open down plunge on several smaller lenses that are located nearby Stag (Figure 2).

A diamond core drilling program commenced during 2016 to test the upper Stag Lens with the aim of defining Mineral Resources to enable studies to be carried out to determine the economic viability of Stag as a potential platform, or starter project, to develop the Triumph deposits. This work has culminated in the completion of a Pre-feasibility Study on Triumph's Stag Lens.

The total Mineral Resource estimate for the Stag Lens is 2.2Mt grading 6.2% Zn, 0.5% Cu, 0.5% Pb, 84g/t Ag and 0.3g/t Au, for contained *in situ* metal estimates of 133,000t Zn, 11,000t Cu, 11,000t Pb, 5.8Moz Ag and 21,000oz Au.

The total Ore Reserve estimate is 1.2Mt grading 6.2% Zn, 0.4% Cu, 85g/t Ag and 0.3g/t Au for contained *in situ* metal estimates of 75,000t Zn, 5,000t Cu, 3.2Moz Ag and 10,000oz Au.

The full reporting of these estimates by JORC Code confidence categories is given further below in Table 3. JORC Code Table 1 check lists for these estimates are included in the appendices to this release.

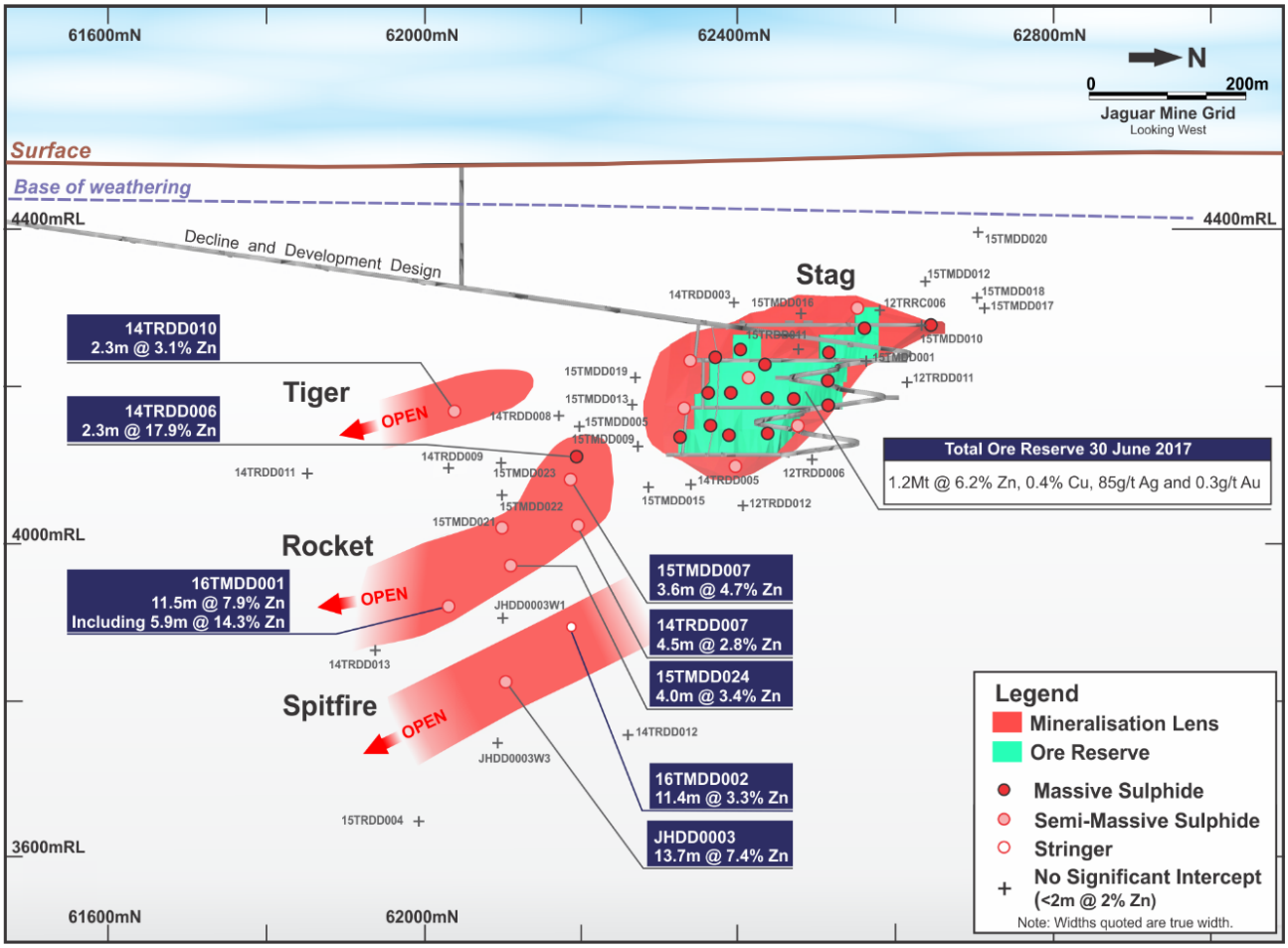


**Figure 2: Long Section Looking West Through the Triumph Deposit**

The proposed method for exploiting the Stag Lens Ore Reserve is a core and shell mining approach, which is a hybrid method utilising sublevel open stope mining (core) and mass firing of the sill and rib pillars (shell) towards the end of the life of mine. The Ore Reserve will be accessed through a 1,400m long decline that has vertical depths ranging from 180m to a maximum depth of 380m below surface.

Under an integrated development scenario, Bentley's ore would be preferentially fed to the Jaguar mill and supplemented with Triumph's ore as necessary to feed 600,000tpa of ore to the processing plant. Jaguar's processing plant is currently mine-constrained because the mining areas at Bentley are limited and can only produce at most 500,000tpa. The proposed development of Triumph would allow the processing plant to be run consistently at a 600,000tpa capacity, with this capability already demonstrated in a one-month trial in 2016.

Ore production rates from a Triumph underground mine are anticipated to range from 150,000tpa to 600,000tpa.

## Jaguar Process Plant Value Enhancement Study

IGO recently completed an internal value enhancement study for Jaguar that included a series of metallurgical test programs combined with engineering design, costing and financial evaluations to assess the feasibility of producing a new precious metal concentrate.

The study work demonstrated that the process plant improvements are technically and financially feasible and would deliver significant value for the business with the additional extensions to mine life through the development of Triumph and/or Bentayga.

The Project would involve the upgrade of the Jaguar process plant from a two-product flotation circuit to a four-phase, three product flotation circuit that would produce higher-grade copper and zinc concentrates through higher metallurgical recoveries from all Bentley ores.

Additionally, a new third concentrate would be produced consisting of lead, gold and silver, referred to as a 'High Precious Metals' (HPM) concentrate. The HPM concentrate would be packaged in 2t 'bulka-bags' and loaded into sea-containers for transport to market. The necessary environmental approvals to ship this new third concentrate are already in place.

The Jaguar process plant enhancement project would deliver Life of Mine averages of 7% increase in copper recoveries and 5% increase in zinc recoveries. The estimated capital cost of the process plant enhancement is approximately $7M to $8M.

## Bentley In-Mine Exploration: Bentayga Discovery

IGO has been exploring for new VHMS lenses at Bentley by drilling diamond core holes from underground sites to target an area south of the main Arnage Lens. During 2017, eight diamond core holes were drilled for a total of 4,720m with several holes intersecting a new massive sulphide lens named Bentayga. Significant drilling results to date are listed in Table 1.

**Table 1: Significant Drill Intersections - Bentayga Discovery**

| Drill Hole Name | Depth From (m) | Intercept Length (m) | True Width (m) | Zn (%) | Cu (%) | Pb (%) | Ag (g/t) | Au (g/t) |
|---|---|---|---|---|---|---|---|---|
| 17BUDD003 | 539.8 | 15.5 | 9.7 | 20.0 | 0.8 | 3.1 | 534 | 3.2 |
| | **Including:** | 10.6 | 6.5 | 27.1 | 1.0 | 4.2 | 712 | 4.2 |
| 17BUDD004 | 572.4 | 14.6 | 9.0 | 3.3 | 1.0 | 0.6 | 113 | 0.4 |
| | **Including:** | 5.6 | 3.4 | 7.0 | 1.2 | 1.4 | 201 | 0.6 |
| 17BUDD005 | 755.2 | 4.8 | 3.0 | 7.8 | 0.1 | 1.5 | 60 | 0.1 |
| 17BUDD006 | 548.4 | 8.6 | 5.4 | 9.5 | 0.4 | 0.9 | 208 | 0.8 |
| | **Including:** | 6.4 | 4.0 | 12.0 | 0.4 | 1.2 | 264 | 1.0 |

The Bentayga mineralisation style is like the other massive sulphide lenses of Bentley, which contain a typical VHMS sulphide assemblage of sphalerite, chalcopyrite, galena, and pyrite. Bentayga was discovered approximately 250m south of the current Bentley decline and the mineralisation extends over approximately 200m along strike and 150m vertically.

The Bentayga zone remains open to the south and at depth. Diamond core drilling is currently continuing to define the central high-grade core and extents of the newly discovered Bentayga Lens.

A second target area is defined beneath the Bentayga zone.

The appendices at the end of this ASX release contains a list of the locations and results for five of the eight diamond holes completed in the 2017 program.

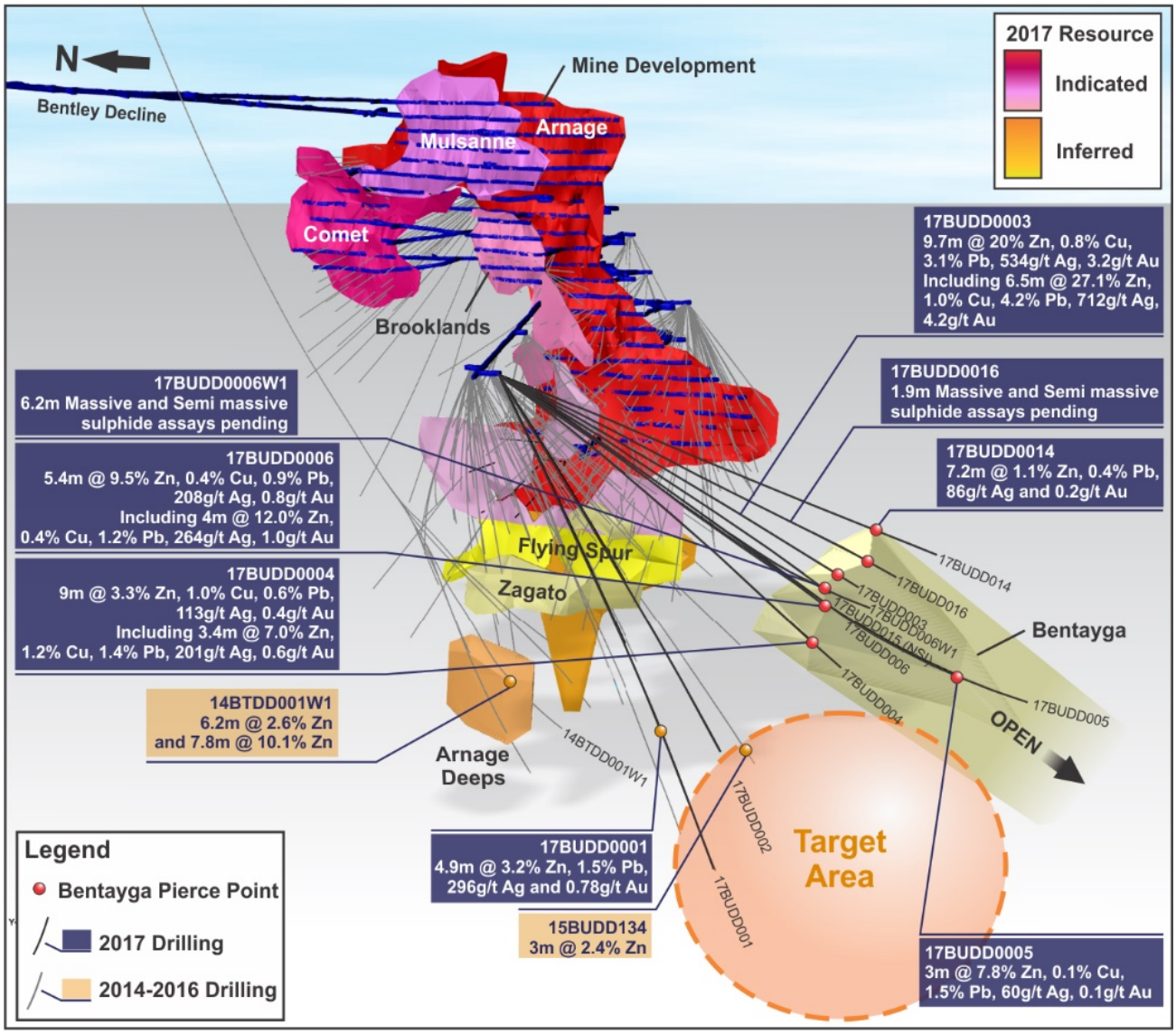


**Figure 3: Bentley Mine and Recent Bentayga Lens Discovery Drilling Results.**

## Regional Exploration Update

### Heather Bore

IGO has drilled a total of 102 air core (AC) holes for 9,359m at the Heather Bore Gold Prospect, with drilling concentrated on infilling 3.5km along the strike of a shear system which was targeted for gold in 2001 and 2002 by prior tenement holders.

The AC drilling has defined a mineralised shear that is located along a major stratigraphic contact. The shear zone extends through a sediment sequence over widths ranging from 150m to 200m, with these zones characterised by intense potassic, sericite and pyrite alteration.

The Heather Bore shear system remains open both north and south along strike. Further drilling is planned to test below the identified anomalies. Initial AC assay results have revealed that most of the elevated gold concentrations is present at weathering fronts within the regolith. A selection of significant drill results are listed in Table 2 below.

**Table 2: Heather Bore Drill Results**

| Drill Hole Name | From (m) | Interval (m) | Au (g/t) |
|---|---|---|---|
| 17TRAC002 | 88 | 4 | 0.63 |
| 17TRAC003 | 52 | 8 | 0.70 |
| 17TRAC010 | 60 | 4 | 0.71 |
| | 80 | 12 | 0.61 |
| 17TRAC012 | 48 | 4 | 0.87 |
| | 60 | 4 | 1.30 |
| 17TRAC017 | 52 | 4 | 0.61 |
| 17TRAC021 | 64 | 4 | 1.46 |
| 17TRAC034 | 20 | 4 | 0.65 |
| | 60 | 4 | 1.36 |
| 17TRAC037 | 44 | 4 | 0.72 |
| 17TRAC040 | 60 | 4 | 1.38 |
| 17TRAC053 | 48 | 4 | 0.44 |
| 17TRAC055 | 44 | 4 | 0.41 |
| 17TRAC067 | 52 | 16 | 0.43 |
| 17TRAC072 | 60 | 4 | 1.19 |
| 17TRAC073 | 44 | 4 | 2.24 |
| 17TRAC084 | 44 | 4 | 0.45 |
| | 60 | 4 | 0.44 |
| 17TRAC098 | 48 | 4 | 1.02 |
| 17TRAC099 | 48 | 4 | 0.47 |

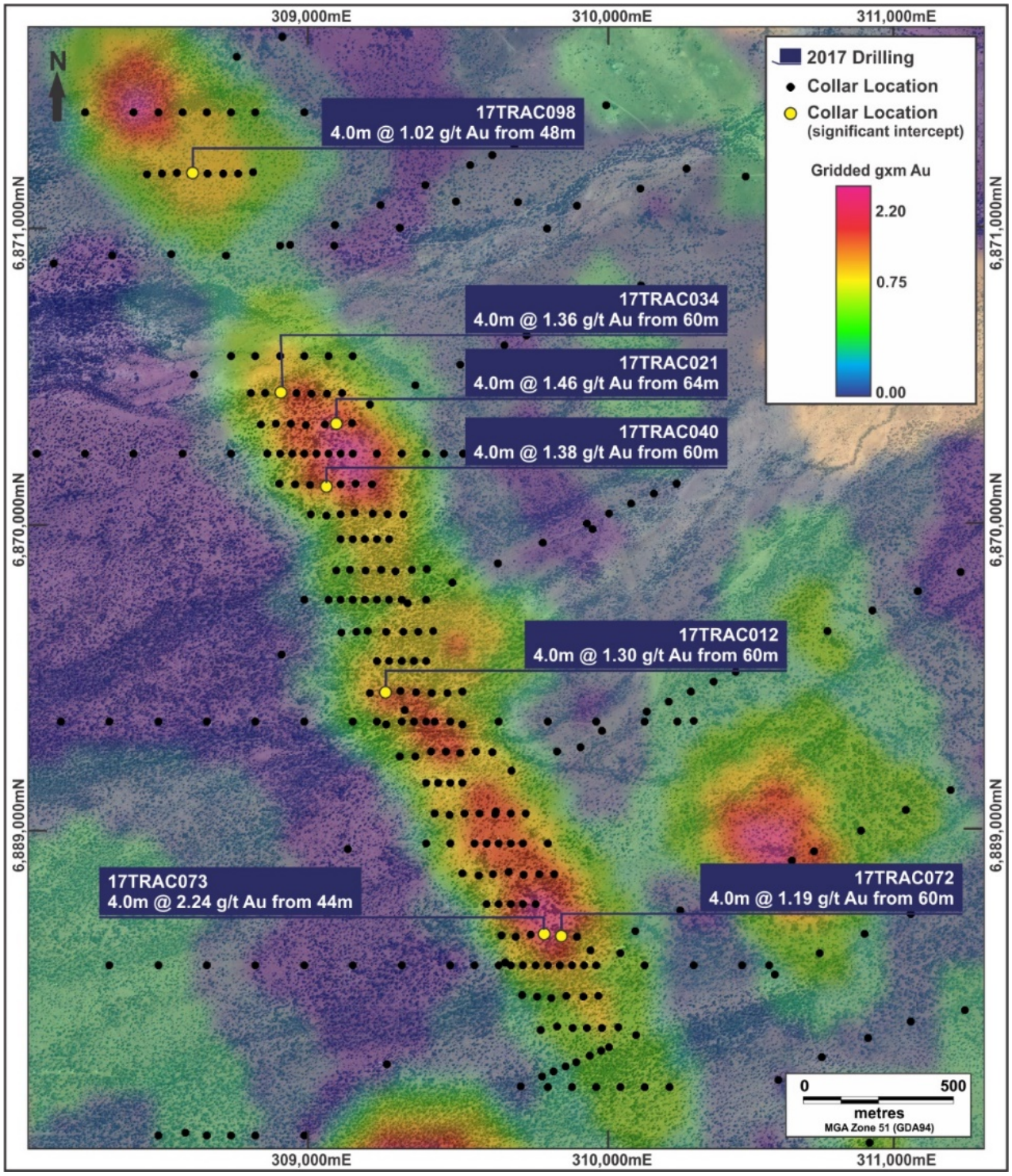


**Figure 4: Heather Bore Gold Prospect Significant Intercepts**

## Next Steps / Project Schedule

Any decision to proceed on the development of Triumph and the Jaguar process plant improvements will likely need to be made at the same time.

The next steps to progress the Triumph Project include:

- Progression with the Project Management Plan specific to the development of a Triumph decline is currently under review by the WA Department of Mines, Industry Regulation and Safety.
- A technical review and assessment will be required by the WA State Mining Engineer for the project to progress.
- De-risking cost estimates associated with underground mining.
- Planning additional surface diamond drilling to test the extents of the other three lenses.

IGO anticipates the decision relating to a capital investment into development of Triumph and the process plant improvements will be made in first half of FY18.

In parallel with this work flow, drilling at Bentayga to understand its extents will continue, as will the regional exploration at Heather Bore and elsewhere in the project tenement holdings.

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### JORC Code (2012) Competent Persons' Statements

*The information in this report that relates to the Triumph Mineral Resources is based on and fairly represents information and supporting documentation compiled by Mr William Stewart. Mr Stewart is a full-time employee and security holder of the Company and member of The Australasian Institute of Mining and Metallurgy and member of Australian Institute of Geoscientists. Mr Stewart has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they have undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.*

*The information in this report that relates to the Ore Reserves is based on information compiled by Mr Daniel Donald who is a Fellow of The Australasian Institute of Mining and Metallurgy. Mr Donald is a full-time employee of Entech Pty Ltd. Mr Donald 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 'Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.*

*Mr Stewart and Mr Donald consents to the inclusion in the report of the matters based on their information in the form and context in which it appears.*

### Forward Looking Statement

*This announcement contains forward-looking statements regarding future events, conditions and circumstances including but not limited to statements regarding plans, strategies and objectives of management, anticipated timelines and expected costs and rates of processing and recovery. Often, but not always, forward-looking statements can be identified by the use*

*of forward-looking words such as "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue" and "guidance", or other similar words.*

*These forward-looking statements are not a guarantee of future performance and involve unknown risks and uncertainties, many of which are beyond IGO's control, which may cause actual results and developments to differ materially from those expressed or implied. These risks include but are not limited to economic conditions, stock market fluctuations, commodity demand and price movements, access to infrastructure, timing of approvals, regulatory risks, operational risks, reliance on key personnel, reserve and resource estimations, native title and title risks, foreign currency fluctuations, exploration risk and mining development, construction and commissioning risk.*

*Forward-looking statements in this announcement apply only at the date of issue. Subject to any continuing obligations under applicable law or regulations, IGO does not undertake to publicly update or revise any of the forward-looking statements in this announcement or to advise of any change in events, conditions or circumstances on which any such statement is based. Readers are cautioned not to place undue reliance on any forward-looking statements contained in this announcement.*

# APPENDIX A – TRIUMPH MINERAL RESOURCE AND ORE RESERVE ESTIMATES

## Geology

IGO discovered the Triumph deposit in 2014 following an in-house study that identified a large geochemical halo in historic cores that were drilled immediately north of the deposit. Triumph has strong similarities to the Bentley style of mineralisation where copper-rich stringer feeder systems occur below massive sulphide lenses.

The geology hosting Triumph consists of a basal mass flow rhyolite succession overlain by clastic sediments, further overlain by a mafic to intermediate volcanic succession that consists of submarine basalts and reworked volcaniclastic sediments. The mass flow unit is locally intruded by tholeiitic dolerite sills and dykes that range in width from a few centimetres to tens of metres. Post-mineralisation, a rhyodacite intrusive has bifurcated the northern extent of the Stag massive sulphide lens. This unit ranges from 1m to 3m in width.

Triumph can be classified as a typical replacement-style VHMS deposit where sulphide-bearing fluids have passed through the rhyolite basement before replacing an overlying clastic sedimentary unit. The massive sulphide mineralisation occurs at the basal rhyolite and sediment contact, and consists of massive, semi-massive, stringer and disseminated sulphides. The sulphide mineralogy at Triumph includes pyrite, sphalerite, chalcopyrite, galena, arsenopyrite and pyrrhotite. The massive sulphide lenses range in average true thickness from 2m to 40m.

The Triumph mineralisation occurs in four separate massive sulphide lenses named Stag, Rocket, Spitfire and Tiger (refer to Figure 2). Each lens is bounded by a basal stringer and an upper disseminated sulphide domain, with the basal stringer and upper disseminated domains transitioning to the massive sulphide domains. The Stag Lens has a strike length of approximately 350m. Stag has a shallow, southerly down plunge extent of 400m and a maximum true thickness of 40m. Stag Lens starts at approximately 170m below surface and extends 400m vertically.

## Mineral Resource Estimate

IGO discovered the Triumph deposit in 2014 and has since completed a significant Mineral Resource definition drill program through 2016. The first Mineral Resource for Triumph has now been estimated to contain 2.2Mt grading 6.2% Zn, 0.5% Cu, 0.5% Pb, 84g/t Ag and 0.3g/t Au, using an ≥ A$100/t net-smelter-return cut-off for massive sulphide mineralisation and A$45/t for stringer mineralisation (refer to Table 1).

**Table 3: Triumph's First Mineral Resource Estimate by JORC Code Classification**

| JORC Code Classification | Tonnes (Mt) | Grades | | | | Estimated Total *In-Situ* Metal | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Zn (%) | Cu (%) | Ag (g/t) | Au (g/t) | Zn (kt) | Cu (kt) | Ag (Moz) | Au (Moz) |
| Measured Mineral Resource | - | - | - | - | - | - | - | - | - |
| Indicated Mineral Resource | 1.7 | 6.0 | 0.5 | 81 | 0.3 | 102 | 8 | 4.4 | 16 |
| Inferred Mineral Resource | 0.5 | 6.9 | 0.4 | 94 | 0.3 | 31 | 2 | 1.5 | 4 |
| **Total** | **2.2** | **6.2** | **0.5** | **84** | **0.3** | **133** | **11** | **5.8** | **21** |

*Notes:*

1. The massive sulphide zone of the Mineral Resource is reported above a block net value of A$100/t, with this cost including the expected full sustaining cost of mining.

2. The stringer sulphide zone is reported above block net value of $45/t, with this cost including the expected incremental mining costs where stringer sulphide Mineral Resources abut massive sulphide Mineral Resources.
3. The in-situ metal estimates of metal do not imply the metal is wholly recoverable.
4. Estimates are rounded to significant figures appropriate to the level of confidence in the estimates. As such, the totals and averages may not appear to sum and average correctly due to rounding.
5. None of the Inferred Resource is significantly extrapolated away from data as such the Competent Person considers reporting the proportion of extrapolated Inferred Mineral Resource is not required.
6. Moz = millions for troy ounces (31.1035 g)
7. The Mineral Resource is inclusive of the Ore Reserve
8. Refer to Appendix B for JORC Code (2012) Table 1

## Proposed Mining Method

A core-and-shell method is proposed to mine the Triumph deposit. This method involves an initial phase of up hole benching and sublevel open stoping to extract the 'cores' as primary stopes. Following the extraction of the core ore with minimal dilution, a mass firing of sill and rib pillars would be executed to recover the ore 'shell' in a secondary stoping phase. After the shell has been blasted, dry rock fill would be introduced from a top fill level to mitigate potential mass failures and reduce any oversize waste dilution reporting to the stope draw points. The top fill needs to be added at the same rate as the ore is extracted.

The key advantages of the core-and-shell method to mine the Triumph deposit are:

- The top-down mining method enables high grade ore to be sourced early in the production sequence,
- The core phase of mining has relatively low waste dilution and high recovery without the cost of fill,
- The shell phase is a bulk mining method that enables high production rates commensurate with the 600,000tpa Jaguar maximum mill capacity, and
- The unconsolidated rock fill is relatively inexpensive compared to paste fill methods, which require a paste plant and other capital costs.

## Ore Reserve Estimate

The conversion percentages of the Triumph Indicated Mineral Resource estimate to a Probable Ore Reserves estimate is 70% in terms of tonnage, 74% for zinc; 58% for copper; 73% for silver and 82% for gold. Table 2 is a listing of the Ore Reserve.

**Table 4: Triumph's Ore Reserve Estimate by JORC Code Classification**

| JORC Code Classification | Tonnes (Mt) | Grades | | | | Total In-Situ Metal | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Zn (%) | Cu (%) | Ag (g/t) | Au (g/t) | Zn (kt) | Cu (kt) | Ag (Moz) | Au (Moz) |
| Proved Ore Reserve | - | - | - | - | - | - | - | - | - |
| Probable Ore Reserve | 1.2 | 6.2 | 0.4 | 85 | 0.3 | 75 | 4.6 | 3.2 | 10.4 |
| **Total** | **1.2** | **6.2** | **0.4** | **85** | **0.3** | **75** | **4.6** | **3.2** | **40.4** |

*Notes:*

1. The Ore Reserve is reported using net value cut off grades of $A110/t for direct mill feed ore and $A79/t for marginal feed ore.
2. Metal price assumptions are as per Table 5 below.
3. Metallurgical recovery factors are per Table 6 below.
4. Mining method assumes a cone and shell.
5. Moz is millions for troy ounces (31.1035 g)
6. JORC Code (2012) Table 1 Parameters are contained in Appendix B of this release

**Table 5: Metal Price Factors**

| Period (Months) | FX (AUD:USD) | Metal Price Forecast Assumptions | | | |
|---|---|---|---|---|---|
| | | Cu (US$/t) | Zn (US$/t) | Ag (US$/oz) | Au (US$/oz) |
| 0 to 12 | 0.74 | 5,500 | 2,500 | 17.60 | 1,227 |
| 13 to 18 | 0.74 | 5,500 | 2,500 | 17.70 | 1,237 |
| 19 to 24 | 0.74 | 5,500 | 2,500 | 17.70 | 1,245 |
| 25 to 30 | 0.73 | 5,839 | 2,773 | 18.29 | 1,252 |
| 31 to 42 | 0.73 | 6,035 | 2,550 | 18.85 | 1,291 |

**Table 6: Metallurgical Recovery Factors**

| Concentrate Produced | Metallurgical Recovery to Concentrate | | | |
|---|---|---|---|---|
| | Copper | Zinc | Silver | Gold |
| Copper | 35.0% | - | - | 20.7% |
| Zinc | - | 89.0% | 18.0% | 15.0% |
| HPM | - | - | 37.0% | - |
| Total | 35.0% | 89.0% | 45.0% | 35.7% |

In the Triumph Pre-Feasibility, a trade-off study was prepared with two separate mining schedules, with one schedule for a stand-alone Triumph mine, and the second schedule having integrated ore production from both Triumph and Bentley. The key conclusions of this trade-off study were that the integrated approach resulted in a higher cash flow and allowed the Jaguar processing plant to run at its maximum capacity of 600,000tpa.

## Metallurgy and Processing

Metallurgical samples from the Triumph deposit were laboratory tested to replicate both the current Jaguar process flow sheet and the proposed plant upgrade flow sheet. The key findings of this metallurgical testing were that:

- Tests produced good high precious metal (HPM) concentrate grades at over 35% Pb and 2,000g/t Ag. For high lead feed grades (>1% Pb), HPM flotation of Triumph ore could most likely produce better results if no copper flotation takes place within the process.
- The tests produced consistent high-grade Zn concentrates between 47% and 60% Zn. The HPM flowsheet tests contained higher Zn grade and an elevated Zn recovery.
- Copper recovery from Triumph is largely driven by head-grade.

Triumph mineral wealth is from the recovery of zinc and silver. Recovery algorithms have been developed for Triumph.

# APPENDIX B: JORC CODE TABLE 1

## Section 1: Sampling Techniques and Data

| Criteria | Comments |
|---|---|
| Sampling techniques | - Triumph:<br>  - Diamond core drilling – refer to the subsections below for material aspects of this sampling.<br>  - A total of 13 holes drilled from surface for a total of 4,435 m.<br>- Bentley (Bentayga):<br>  - Diamond core drilling – refer to the subsections below for material aspects of this sampling<br>  - A total of 8 holes drilled from underground sites for a total of 4,720 m.<br>- Heather Bore:<br>  - Air core drilling – refer to the subsections below for material aspects of this sampling<br>  - A total of 102 holes drilled from surface for a total of 9,359 m. |
| Drilling techniques | - Triumph:<br>  - Diamond core holes drilled at various angles from surface as either HQ2 (63 mm) or HQ3 (61.1 mm) diameter core.<br>  - Standard HQ3 core is drilled through any weathered clay saprolite zones to ensure high core recovery.<br>  - Standard HQ2 core is drilled through competent saprock and fresh rock zones for faster penetration rates.<br>  - Where possible core was oriented using a Reflex ACT II core orientation tool.<br>- Bentley (Bentayga):<br>  - Angled diamond core drilling from underground sites as either NQ2 (50.6 mm) or HQ2 (63.5 mm) diameter core.<br>  - Standard HQ2 core is drilled to minimize hole deviations where necessary<br>  - Standard NQ2 core is drilled for faster penetration rates and where wedging to correct hole deviation is required.<br>  - Where possible core was oriented using a Reflex ACT II core orientation tool.<br>- Heather Bore:<br>  - Air core from surface using blade bits to the top of fresh rock (driller's blade refusal)<br>  - Holes were usually vertical |
| ***Drill sample recovery*** | - Triumph:<br>  - Core recovery was quantified by measuring the length of recovered core after each ore run by assembling the extracted core an angle iron frame and measuring the recovered length with a tape measure.<br>  - The average core was found to be >98%.<br>  - The recovered core is generally competent, non-porous and cuts with minimum fines washing from the core. As such, sample biases resulting from fines losses or poor core recovery are unlikely<br>- Bentley (Bentayga):<br>  - Core recovery was quantified by measuring the length of recovered core after each ore run by assembling the extracted core an angle iron frame and measuring the recovered length with a tape measure.<br>  - The average core was found to be >99%.<br>  - The recovered core is generally competent, non-porous and cuts with minimum fines washing from the core. As such, sample biases resulting from fines losses or poor core recovery are unlikely<br>- Heather Bore:<br>  - Drill sample recovery is qualitatively logged for recovery<br>  - Sample recovery was often affected by high volumes of ground water but was deemed generally acceptable for purpose (geochemical mapping) |
| ***Logging*** | - Triumph & Bentley (Bentayga):<br>  - The geology of the total length of all core holes were logged by IGO's geologist using laptop computers to enter the log data into an AcQuire SQL database using templates using the IGO's standardised logging codes.<br>  - Geological logging includes qualitative data include such as lithology, deformation, structure, alteration, mineralisation, veining, and quantitative data such as RQD, and recovery.<br>  - All diamond drill cores were orientated within 30 m of mineralised zones, were photographed and geotechnically logged.<br>  - The Competent Person considers the quality and detail of logging is adequate to support Mineral Resource and Ore Reserve estimation, and other downstream studies. |

| Criteria | Comments |
|---|---|
| | - Heather Bore:<br>  - The geology of the total length of all core holes were logged by IGO's geologist using laptop computers to enter the log data into an AcQuire SQL database using templates using the IGO's standardised logging codes.<br>  - Geological logging includes qualitative data include such as lithology, deformation, structure, alteration, mineralisation, veining, and recovery.<br>  - Chip trays are collected as a physical record of each logging interval<br>  - The Competent Person considers the quality and detail of logging is adequate to support follow up exploration works |
| ***Sub-sampling techniques and sample preparation*** | - Triumph & Bentley (Bentayga):<br>  - All assay despatch samples were collected from diamond core using lithologically limited sampling intervals ranging from 0.3 m to 1.3 m but generally targeting a 1.0 m length where possible.<br>  - Monitoring of core recovery has been use do ensure the representativeness of the samples collected.<br>  - The core from assay despatch interval is cut longitudinally with an Almonte automated wet-bladed diamond core saw in half along the orientation line, and then quartered.<br>  - The same quadrant quarter of core was always selected for assay, with the other half core of core sometimes submitted for metallurgical testing. The remaining quarter core sample is retained for reference in the plastic core tray.<br>  - Routine assay sample weights submitted to the laboratory range in mass from 0.7 kg to 3.2 kg depending on sample length, with an average mass of 1.8 kg. Samples are collected into pre-number calico bags for sample despatch, with a unique sample number assigned to each interval.<br>  - The quarter core subsamples are further prepared and subsampled by Intertek Genalysis (Intertek) Laboratory who are in Maddington, Western Australia.<br>  - All samples received by Intertek were cross-checked against IGO's submission sheets to identify any discrepancies between sample numbers despatched and sample numbers received. If discrepancies such as missing or extra samples are found, Intertek contacts IGO to resolve such issue before laboratory sample preparation proceeds.<br>  - All samples received were ovem dried for a minimum of 2 hours at 105°C prior to jaw crushing<br>  - Oven-dried samples were first crushed to <10 mm maximum particle size via a jaw crusher and then crushed to a minus <2 mm using a Boyd crusher-splitter device.<br>  - The <2 mm crushed lot was rotary split as part of the Boyd crushing process sub sample mass < 3kg. Any splitter reject was retained if the primary lot mass was > 3 kg.<br>  - A barren basalt-wash ('road metal') was crushed between each routine sample following crushing to minimise possible cross-contamination between routine samples.<br>  - The <2 mm crushed subsample was then pulverised for 6 minutes in a LM5 puck mill to a particle size distribution (PSD) of at least 85% passing 75 microns. A sub sample is collected by scoop into a paper packet and the sample reject is retained for reference.<br>  - Sieve (75 micron) mass-passing tests were performed on 10% of all routine samples to ensure compliance with the PSD pulverising requirements for successful liberation for digestion.<br>  - Any samples that failed the PSD sieve test were recombined with any rejects and re-pulverised to ensure PSD pulverisation compliance.<br>  - Replicated samples are collected at a 1:50 frequency as a second quarter core sample to monitor the primary precision.<br>  - A replicate sample is also collected at a 1:20 frequency from the pulverised lot.<br>- Heather Bore:<br>  - Primary lots from the AC stream are collected into a bucket from the rig cyclone and laid out on the ground in separate piles.<br>  - These piles are scoop-sampled into pre-numbered calico bags to prepare a 2.5 kg composite from each 4 m of drilling or alternatively a several -scoops sample from the bottom-of-hole drill interval.<br>  - Samples are despatch to Intertek in Perth and undergo a similar sub sampling protocol to the that described for the core samples above<br>  - Replicate samples… |
| ***Quality of assay data and*** | - Triumph & Bentley (Bentayga): |

| Criteria | Comments |
|---|---|
| ***laboratory tests*** | - The assaying method applied to pulverised samples is a digestion of an aliquot of the pulp followed by assay reading using equipment for key elements (Name them). The assaying method is considered near total for the key value elements.<br>- Sample quality monitoring consists of inserting certified reference materials (CRMs), blanks and replicates into the routine sample stream by both Intertek and IGO.<br>- IGO monitors that crusher (<2 mm PSD) subsampling precision by collecting a second rotary split from the Boyd device at a 1:50 frequency.<br>- IGO monitors possible cross-contamination by submitting blank coarse rock (crushed chert) with the routine samples at a 1:20 frequency. Analysis of these blanks has revealed xx% cases where significant cross contamination has been identified.<br>- IGO monitors assay accuracy by inserting known-grade CRMs with routine samples at 1:20 frequency. The CRMs are 50 g packets of matrix matched materials prepared by pulverising concentrates and mine ore from Jaguar and Golden Grove Operations. Several custom CRMs have been used with all prepared by Geostats for a range of grades. IGO's Analysis of these accuracy quality samples has confirmed acceptable analytical accuracy.<br>- IGO has not submitted any external laboratory or same-laboratory re-submission checks, nor has IGO reviewed Intertek's internal quality control results.<br>- The Competent Person for the Triumph & Bentley (Bentayga) reporting considers the overall analytic performance of the Intertek laboratory is satisfactory.<br>- Heather Bore:<br>- The assaying method applied to pulverised samples from 4 m down hole composites was an aqua regia digestion of an aliquot of pulp followed by the analysis of the redissolved digestion salts by ICP/MS or ICP/OES for elements of interest. This method is considered near total for the value elements.<br>- Bottom-of-hole samples were subject to a either a 4-acid digestion of a 100 g aliquot with analysis of the redissolved digestion salts by ICP/MS or ICP/OES, or a metaborate/tetraborate fusion of a 0.4 g pulp aliquot followed by an XRF analysis.<br>- Gold was analysed by a lead collection fire assay, which is considered a total method for gold.<br>- The IGO quality protocols are like those described above for core samples with insertion of CRMs, blanks and replicates to monitor accuracy, precision and cross-contamination.<br>- The Competent Person the Heather Bore considers the overall analytic performance of the Intertek laboratory is satisfactory. |
| ***Verification of sampling and assaying*** | - Triumph & Bentley (Bentayga):<br>- On receipt of the assay results, both the senior mine geologist and the logging geologist validate the assay against the geological logging to ensure the assay results are consistent with logging observations of mineralisation and barren zones.<br>- No independent personnel have verified the significant intersections<br>- No twin holes have been drilled to confirm intersection locations and widths<br>- There has been no adjustment to the assay data other than setting below detection limit values to half detection limit for the Triumph MRE work.<br>- Primary data is captured directly into laptop computers linked the IGO's central database to preclude any transcription errors. All assays are merged digitally using the AcQuire data software. All data storage is digital with offsite bac-up protocols in place to ensure data security.<br>- Heather Bore:<br>- The validation and primary data capture process for the Heather Bore drilling like that described above for Triumph and Bentley |
| ***Location of data points*** | - Triumph:<br>- Collar locations have been surveyed using real-time kinematic global positioning system (RTK GPS) equipment to a centimetre precision in three dimensions.<br>- The azimuth of the rig was determined during survey to provide a reliable at-collar azimuth for down hole gyroscopic hole path surveys<br>- The drill hole paths were surveyed using Reflex Gyro equipment with bearing and dip measurements take every 5 m down hole, with both down-hole and up-up hole data collected as a quality control measure. The hole path survey data were checked and validated by the supervising geologist before the data was uploaded into the AcQuire database. |

| Criteria | Comments |
|---|---|
| | - A digital terrane model (DTM) was prepared in 2008 by a reputable survey contractor who photogrammetric methods on aerial photography to the DTM determine elevations on a 25-m grid spacing.<br>- The grid system used for the project area MGA Zone 51 projection for easting and northing coordinates with GDA94 datum for elevations. The local mine grid is a truncation of the MGA/GDA grid with -311,465.6mE and -6,796,594.3mN subtracted from the MGA easting and northings respectively and 4,000m added to the GDA elevations to ensure mine elevations are all positive values. Grid rotation of 23.52 is also applied.<br>- Bentley (Bentayga):<br>- Drill hole collars were oriented at underground rill sites using a north-seeking gyro Azimuth aligner that has precision of ±0.2°<br>- Final collars were surveyed to centimetre precision in three dimesons by the mine surveyor using a Lieca Total Station survey equipment.<br>- The diamond drilling crew used a DeviFlex gyro survey tool to survey the drill hole paths taking reading every 4m down hole. The hole path survey data were checked and validated by the supervising geologist before the data was uploaded into the AcQuire database.<br>- The grid system used for the project area MGA Zone 51 projection for easting and northing coordinates with GDA94 datum for elevations. The local mine grid is a truncation of the MGA/GDA grid with -311465.6mE and -6796594.3mN subtracted from the MGA easting and northings respectively and 4,000m added to the GDA elevations to ensure mine elevations are all positive values. Grid rotation of 23.52 is also applied.<br>- No topographic survey data was required as all holes were drilled from underground collar locations<br>- Heather Bore:<br>- All air core collar locations have been surveyed using conventional global position systems (GPS) equipment to a precision of ± 5 m in horizontal dimensions.<br>- A digital terrane model (DTM) was prepared in 2008 by a reputable survey contractor who photogrammetric methods on aerial photography to the DTM determine elevations on a 25-m grid spacing.<br>- The grid system used for the air core drilling MGA Zone 51 projection for easting and northing coordinates with GDA94 datum for elevations. |
| ***Data spacing and distribution*** | - Triumph:<br>- The nominal drill hole pierce point spacing achieved of the central zone of the Stag Lens is 40 m × 40 m. Elsewhere the drill hole pierce point spacing is nominally 40 m × 40 m. The down hole sample spacing in nominally 1.0 m.<br>- Bentley (Bentayga):<br>- The nominal drill hole pierce point spacing achieved of the central zone of the Stag Lens is 40 m × 40 m. Elsewhere the drill hole pierce point spacing is nominally 40 m across strike × 80 m along strike. The down hole sample spacing is nominally 1.0 m<br>- Heather Bore:<br>The air core drilling is nominally collared on 50 m across strike × 100 m along strike grid. Down-hole sample composites are 4.0 m in length, with bottom-of-hole samples 1.0 m in length. |
| ***Orientation of data in relation to geological structure*** | - Triumph:<br>- Most drill holes intersect the mineralisation at a high angle and as such, samples are collected across the geological layering and sample biases resulting for sample orientation are unlikely.<br>- Bentley (Bentayga):<br>- Most drill holes intersect the mineralisation at a shallow angle and as such, samples may have collected sub parallel to the geological layering with a moderate risk of sample bias due to preferential sampling of higher or lower grade layers as a function of the shallow intersection angles.<br>- Heather Bore:<br>Air core drilling is mostly vertical and as such, intersects the geological layering of the regolith and top of bed-rock at high angle. Andy sampling biases due to the orientation of the sampling is therefore considered unlikely. |
| ***Sample security*** | - All samples for all projects are under constant management of IGO or the laboratory. Samples securely contained and sealed during transport to and from the laboratory in Perth and site.<br>- All transportation is direct with corresponding sample submission forms and consignment notes travelling with the samples, and which are also recorded on site.<br>- The laboratory receives samples and checks them against dispatch documents. |

| Criteria | Comments |
|---|---|
| | - IGO staff are advised of any missing or additional samples.<br>- All storage is secure on site, at the laboratory, and when the sample rejects are returned to site after assay. |
| ***Audits or reviews*** | - Triumph & Bentley (Bentayga)<br>  - Significant intercepts are verified against assay results by IGO's senior geological staff<br>  - There have been no external audits carried out on the quality of sample data.<br>- Heather Bore:<br>  - There have been no external audits carried out on the quality of sample data. |

## Section 2: Reporting of Exploration Results

| Criteria | Comments |
|---|---|
| ***Mineral tenement and land tenure status*** | - Triumph:<br>  - The Triumph deposit is wholly within mining lease M37/1301 held 100% by Independence Jaguar Project Pty Ltd, which is a wholly owned subsidiary of IGO. The tenement expires on 7 Mar 2037 and the rental status is paid in full 7 Mar 2019. Expenditure commitments for the year ending 7 Mar 2017 have been met.<br>  - There have been no external audits carried out on the quality of sample data.<br>- Bentley (Bentayga):<br>  - The Bentley deposit, including Bentayga wholly within mining lease M37/1290 held 100% by Independence Jaguar Pty Ltd, which is a wholly owned subsidiary of IGO. The tenement expires on 2 Feb 2031 and the rental status I paid in full to 2 Feb 2019. Expenditure commitments for the year ending 2 Feb 2017 have been met.<br>- The Heather Bore:<br>  - The area of air core drilling at Heather Bore located wholly with exploration licence E37/1162 held 100% by Independence Jaguar Pty Ltd, which is a wholly owned subsidiary of IGO. The tenement expires on 7 July 2020 and the retail status is paid in full to 7 July 2018. The expenditure status for the year ending 7 July 2017 is no expenditure lodged.<br>- Other:<br>  - Any mine production from Western Australian mining tenements would be subject to state royalty rates<br>  - IGO's senior management has assured the relevant competent persons that the tenure on the tenements listed above is secure at the time of this report and that there are no native title claims or heritage or environmental impediments in effect that would preclude IGO's rights to explore or develop a mine should and Ore Reserve be defined. |
| ***Exploration done by other parties*** | - Triumph and Bentley (Bentayga):<br>  - In 1972 the GSWA mapped the area and idenifed volcanic rocks in the region. In 1974, CEC sampled surface gossans in the area and found Zn-Cu-Pb anomalism. In 1976, Seltrust/CEC discover the Teutonic Bore deposits.<br>  - From 1975 to 1978 Esso and Aquitaine explore the region find some stringer type mineralisation in the Jaguar region. In 1984 Chevron drilled and EM target and misses the Jaguar deposit by 50 m.<br>  - In 1991 MIMEX defined a 700-m long anomaly in the Bentley with follow up drilling intersection stringer mineralisation 170 m below surface but a deeper planned hole cancelled. In 1994 Pancontinental Mining rediscovers the anomaly and intersect 6 m grading 2.4%Zn by a takeover by Goldfields stops exploration.<br>  - In 2001 Inmet-Pilbara identify a 1.8 km long conductor and intersect 7.7 m of Jaguar mineralisation in the second test hole at 485.5 m.<br>  - In 2003 Inmet drills a EM conductor at Bentley but stops in a graphic shale zone in the hangingwall shale. In 2008 Bentley is discover when the 4$^{th}$ hole by Jabiru Metals intersect 10.5 m of high grade at 370 m depth.<br>  - In 2008, IGO acquired Jabiru Metals and since then has been the sole explorer in the Bentley-Triumph area. During, 2010 to 2014 many in-mine discoveries have been made using systematic drilling and down hole geophysical targeting. Extensions lenses discovered included the Far size and Bubble lenses at Jaguar and the Comet, Azure and Flying Spur lenses at Bentley.<br>  - IGO purchased the tenement hosting the Triumph Deposit in 2011 and interested 8.4 m of high grade mineralisation after re-entering and deepening a hole drilled by a prior explorer.<br>- Heather Bore: |

| Criteria | Comments |
|---|---|
| | - Prior to 2008, has been explored for gold by several companies including Great Central Mines, Normandy and Newmont Australia (1998-2001). Newmont completed first-pass air-core drilling over the area that is the subject of the Public Report.<br>- In 2008, IGO acquired Jabiru Metals and since then has been the sole explorer of the Heather Bore area |
| ***Drill hole Information*** | - Triumph and Bentley (Bentayga):<br>- Tabulations of the latest drill hole information for Triumph and Bentayga are included in an appendix to this ASX release.<br>- The Heather Bore:<br>- A representative subset of air drill hole noteworthy results is included in the main release along with a collar location plan. |
| ***Data aggregation methods*** | - Triumph and Bentley (Bentayga) intercepts have been reported using the following parameters:<br>- No minimum intercept widths have been applied<br>- Mineralised zones with greater than 5m of <1% Zn (waste) have been reported separately as individual intervals<br>- No minimum grades cut-off has been applied for the reported intercepts. Excluding the 5m <1% Zn rule to break up mineralised zones described in the previous point.<br>- No top-cuts have been applied to reported intercepts<br>- The Heather Bore:<br>- Data has been aggregated to calculate gram-metre intercept for each hole, with a 50 ppb Au threshold used to report noteworthy intercepts. |
| ***Relationship between mineralisation widths and intercept lengths*** | - Triumph and Bentley (Bentayga):<br>- Mineralised intercepts have been reported as true widths through consideration of the intercept angle of the drill holes with the geological layering determined from core orientations.<br>- The Heather Bore:<br>- Mineralised intercepts approximate true thickness as most holes are drilled vertically through the regolith |
| ***Diagrams*** | - Explanatory plans and/or cross sections are included in this release for all projects discussed – refer the main text |
| ***Balanced reporting*** | - The Competent Persons have provided balanced and representative information for all projects discussed in the included diagrams, tabulations and associated explanations. |
| ***Other substantive exploration data*** | - Density and metallurgical testing has been completed on the Triumph deposit. These results are discussed in Section 3 below<br>- There are no other material exploration data to report for Bentley and Heather Bore |
| ***Further work*** | - Triumph:<br>- Further infill drilling of the Stag lens will be required to assist with grade control purposes.<br>- Additional drilling is being planned to test for possible extension of the Rocket, Spitfire, and Tiger lenses.<br>- Bentley (Bentayga):<br>- The drill hole results will be interpreted and modelled with expectation of reporting a first Mineral Resource for the Bentayga Lens in FY2018.<br>- The Heather Bore:<br>- Basement anomalies identified in the air core drilling will be testing with RC drilling in FY2018 |

## Section 3: Estimate and Reporting of Mineral Resources (Triumph)

| Criteria | Comments |
|---|---|
| ***Database integrity*** | - The database for all collar, survey, geology and assay data is a SQL database with managed using acQuire software.<br>- This acQuire database has several built-in fields and reports to ensure data are entered correctly and conform to validation rules.<br>- Assay data are imported directly from laboratory files and merged with sampling data.<br>- All data is captured digitally and imported directly to the database with few opportunities for keying errors.<br>- All data with the Triumph project code are exported to a Microsoft Access database which serves as a permanent record of the database used Mineral Resource Estimation work. |

| Criteria | Comments |
|---|---|
| ***Site visits*** | - The Competent Person for the Mineral Resource is Mr William Stewart who is the Geology Manager at Jaguar Operation. Mr Stewart regularly checks procedures and processes used to collect data used for Mineral Resource work as part of his site role. |
| ***Geological interpretation*** | - The Competent Person considers that the confidence in the geological interpretation for Triumph is moderate to high, with the mineralisation and geological setting being well understood.<br>- Geological interpretations were prepared using Leapfrog software and was used to control the interpretation of the mineralisation.<br>- Interpretation of the mineralisation was carried out on section from drilling data, and used a combination of the sulphide texture, and the net smelter return (NSR) variable. T<br>- The main factors controlling continuity at Triumph is a post-mineralisation rhyodacite intrusive which bifurcates the mineralisation in the northern part of the main Stag lens. |
| ***Dimensions*** | - Triumph consists of four massive sulphide lenses each with a corresponding basal stringer sulphide and upper disseminated sulphide domains.<br>- Stag Lens is the largest of the massive sulphide lenses and has a strike length of 350 m (north-south) with a shallow, southerly down plunge extent of 400 m and a maximum thickness of 40 m. Stag lens starts at 170 m below the surface and extends 400 m vertically.<br>- Rocket Lens has a strike length and down plunge extent of 230 m and a maximum thickness of 6 m. Rocket starts at 355 m below surface and has a vertical extent of 250 m.<br>- Spitfire Lens has a strike length of 90 m, shallow down plunge extent of 100 m and a maximum thickness of 6 m. Spitfire lens starts at 730 m below surface and has a vertical extent of 90 m.<br>- Tiger Lens is located just above the Rocket lens and has dimensions of 90 m in height, 30 m in strike length and a maximum width of 5 m. Tiger lens starts 300m below surface. |
| ***Estimation and modelling techniques*** | - Statistics and variography were completed using Snowden Supervisor 8 software. Ordinary Block Kriging (OK) and inverse distance squared (ID2) estimation methods were used to estimate grade (Zn, Cu, Ag, Au, Fe, Pb, As, Sb, S) and density estimation.<br>- Digital block models were prepared completed utilising Surpac 6.6.2 software. have been estimated.<br>- OK estimates were prepared for the Stag Lens massive, stringer and disseminated sulphide lenses as closer spaced data provided sufficient information for interpretation of reliable continuity models, which are used for the sample weighing in OK estimates.<br>- All other mineralisation was estimated using the ID2 estimation method with the ID2 assigned a lower JORC Code classification confidence compared to the Stag Lens OK estimates.<br>- All estimates were made from drill hole data composited to a uniform 1.0 m composite length.<br>- For OK estimates, the search neighbourhood parameters set based on the results of continuity modelling.<br>- A kriging neighbourhood analysis (KNA) was prepared to select the optimum parent block size for grade estimation.<br>- Each variable has been estimated independently but for highly correlated variables, such as iron-sulphur-density and lead-antimony, the same continuity model and sample search criteria were applied to preserve the between variable correlations in the final block estimates.<br>- The grade and density estimates was constrained to within each massive sulphide and stringer sulphide lens using 3D domain digital model, with estimation boundaries treated as ‘hard’ boundaries so that only the composites within each respective domain were used to estimate block grades in the corresponding blocks of each domain.<br>- The maximum grade extrapolation distance for the Stag Lens is 40m with all other lenses having a maximum extrapolation distance of 70m.<br>- Sample search distances were set to 150m for the first estimation pass (Pass 1) and up to 250m for the third estimation Pass 3.<br>- Pass 1 required from at least 8 to a maximum of 36 composites in the Pass 1 search neighbourhood before I block could be estimated. Pass 2 and Pass 3 searches had the minimum number of samples reduced to 4, while the maximum number of samples was maintained at 36. These constraints applied to both OK and ID2 estimates<br>- There has been no mining at Triumph so mining reconciliation is not relevant.<br>- Assumptions have been made regarding the recovery of by-products such as gold and silver which are accessory to zinc, copper and lead.<br>- The drill hole intercept spacing of the Stag lens is nominally 40 m × 40m. Drill spacing increases to 40 m × 80m outside the immediate Stag lens area. |

| Criteria | Comments |
|---|---|
| | - Based on KNA work, the parent block size was set to dimensions 20mN × 2mE × 40mRL with sub-blocks permitted down to dimensions of 5mN × 0.5mE × 5mRL to provide acceptable domain boundary resolutions.<br>- Block grades were estimated on a parent cell basis using an internal node discretisation of 5Y × 5X× 5Z.<br>- No deleterious elements or other non-grade variables have been estimated.<br>- No modelling of selective mining units has taken place.<br>- Top-cuts were applied to the estimation composites on a domain basis to reduce the local influence of extreme values.<br>- Top-cut grades were determined from a review of the composite sample data statistics, histograms and log-probability plots.<br>- The block model was validated by on-screen inspection of the input composites and output block estimates drilling data using plan and cross section views.<br>- The inputs and output were then compared in terms of global mean grades and on moving window "swath" plots to confirm the grade trends in the input data had been correctly reproduced the block estimates. |
| ***Moisture*** | - Grade and density estimates are on a dry tonnage basis, moisture not been estimated |
| ***Cut-off parameters*** | - The reporting of the Mineral Resource was based on a combination of mineralisation type and Net Smelter Return (NSR) that was derived from estimated future mining and processing costs, applied on a fully costed basis for the massive sulphide domain.<br>- The report cut-off for stringer and disseminated domains also used an NSR cut-off, but was applied on an incremental cost basis.<br>- For massive sulphide domains, a reporting cut-off of $A100 NSR was employed. Stringer and disseminated sulphide domains employed a reporting cut-off of $A45 NSR. |
| ***Mining factors or assumptions*** | - Triumph is considered amenable to underground mining only due to the depth to the top of the mineralisation.<br>- Economic grade and mineralisation continuity were taken into account with some areas on the periphery of the ore body have not been reported in the Mineral Resource. |
| ***Metallurgical factors or assumptions*** | - Metallurgical recovery factors are included within the NSR calculation and considered when forming reporting cut-off parameters.<br>- The Jaguar processing facility has been treating similar ores proficiently for 10 years and similar metal recovery has been assumed for the Triumph deposit pending metallurgical testing.<br>- Metallurgical test work is underway and will for part of the Ore Reserve estimate. |
| ***Environmental factors or assumptions*** | - Pending completion of environmental studies, it has been assumed that existing environmental management protocols derived from the Jaguar and Bentley operations will be appropriate for the mining and treatment of the Triumph mineralisation. |
| ***Bulk density*** | - JML/IGO performed density test work on almost all core samples that were submitted to the laboratory for assay.<br>- All density measurements have been determined using the simple water immersion technique, on uncoated core and for the entire sample interval. Core was uncoated because it was deemed to be impervious.<br>- Validation of the density measurements is carried out by the combined assays for Cu, Pb, Zn and Fe compared with the measured densities.<br>- A regression curve is used to determine if spurious measurements have been taken. Outliers (outside a nominal ±10% from the regression curves) are removed from the dataset and a calculated density, using the appropriate regression formula, is assigned only to those samples without an actual correct density measurement. Density is estimated via OK and ID2.<br>- Density is used to weight each of the sample composite in the estimation. |
| ***Classification*** | - JORC Code classification for the 2017 Triumph Mineral Resource estimate incorporates all aspects of data quality, including intersection orientation, sample spacing as well as understanding of the grade and geological continuity.<br>- Indicated Mineral Resources have been assigned where the drill spacing < 40m along strike and down dip, the kriging efficiency (KE) >0.3, regression slope (RS) >0.5, there is high to moderate confidence, and where grade and geological continuity can be assumed.<br>- Inferred resources have been assigned where the drill spacing > 40m along strike and down dip, the KE <0.3, the RS <0.5, and where there is moderate to low confidence in grade and geological continuity. |
| ***Audits or reviews*** | - Consultants, Optiro Pty Ltd completed an audit on the 2017 Mineral Resource estimate and found no material issues with the input data, estimation method and reported estimate. |

| Criteria | Comments |
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| ***Discussion of relative accuracy/confidence*** | - Indicated Mineral Resource have moderate level of local confidence suitable for Ore Reserve studies.<br>- Inferred Mineral Resources have low confidence and are not suitable for Ore Reserve studies, with estimates having only global precision but no local precision.<br>- As this is the first resource for the Triumph deposit, no mining and subsequent reconciliation has been performed. |

## Section 4: Estimation and Reporting of Ore Reserves (Triumph)

| Criteria | Comments |
|---|---|
| ***Mineral Resource estimate for conversion to Ore Reserves*** | - The Mineral Resource used as the basis for the Ore Reserve is described in Section 3<br>- The Mineral Resources are reported inclusive of the Ore Reserves discussed in this section |
| ***Site visits*** | - The competent person has not visited the site.<br>- The competent person is comfortable relying on reports from other independent consultants, and other Entech staff, who have visited the site and other operations in the area respectively. |
| ***Stud Status*** | - The reserve is based on a Pre-Feasibility Study completed on the Triumph underground.<br>- Triumph will operate as a component of the Jaguar Operation which includes the adjacent Bentley Mine and Jaguar Processing Facility, both of which are in operation.<br>- Modifying factors accurate to the study level have been applied based on detailed stope design analysis.<br>- Modelling indicates that the resulting mine plan is technically achievable and economically viable. |
| ***Cut-off parameters*** | - Cut-off values are calculated based on Net Smelter Return (NSR).<br>- The Mineral Resource model is evaluated against the NSR cut off value and mining areas (stopes and development) are designed for those areas above the NSR cut off value.<br>- All designed stopes and development are then assessed individually to verify that they are above the NSR cut-off and can be economically mined.<br>- The mill feed NSR cut-off used is $A110/t with a marginal cut-off NSR value of $A79/t. For development ore, a $A45/t cut-off NSR value has been used. |
| ***Mining factors or assumptions*** | - All Ore Reserves are estimated by construction of three-dimensional mine designs and reported against updated Mineral Resource block models.<br>- After modifying factors are applied, mining schedule physicals are input to a cost model where each stope is economically evaluated, and the total reserve is evaluated to assess its economic viability.<br>- The planned mining method is a core and shell mining method, where primary stopes are extracted (cores), and secondary ribs and crown pillars (shells) are mass-blasted.<br>- Once mass-blasting of the shells commences and ore is drawn from the draw points, unconsolidated waste rock fill is introduced to minimise open spans.<br>- Independent geotechnical consultants contributed geotechnical data to a suitable level of detail. This data forms the basis of mine design, ground support and mining method selection for the Reserve estimate.<br>- A “damage zone” has been identified by the independent geotechnical consultant which requires additional ground support in specified development, and costing for this has been included in the financial model.<br>- It is the geotechnical parties’ assessment that the risk associated with this damage zone can be quantified by additional numerical modelling that would be undertaken at a feasibility level study.<br>- The mining sequence has also been reviewed by an independent geotechnical consultant who has not identified any fatal flaws, but has recommended numerical modelling be used to improve the reliability of this work at a feasibility level study stage.<br>- Modifying factors are applied based on the chosen mining method with unplanned dilution (10% for cores, 20% for ribs and 25% for crowns) and mining recovery (90% for cores, and 80% for ribs and crowns). The modifying factors are based on empirical data utilising a similar mining method.<br>- A minimum mining width of 2.5 m was used in stope design.<br>- In cases where Inferred Mineral Resources are present in the design, this material has been assigned as waste and re-evaluated to ensure it is economically viable. |

| Criteria | Comments |
|---|---|
| | - Any capital required, including infrastructure capital, has been included in the cost model. |
| ***Metallurgical factors or assumptions*** | - Ore from Triumph will be processed at the Jaguar processing facilities. The process and recovery of contained metal is well understood and reasonably consistent in performance.<br>- The following metallurgical recovery factors have been used: 35% Cu recovery into Cu concentrate, 37.0% Ag recovery into Cu concentrate, 20.7% Au recovery into Cu concentrate, 89.0% Zn recovery into Zn concentrate, 15% Au recovery into Zn concentrate and 18.0% Ag recovery into the Zn concentrate.<br>- Deleterious elements have been taken into consideration in the NSR calculation.<br>- The Triumph orebody replicates the Bentley orebody which is in the same geological system. The Bentley ore is processed in the same process concentrator proposed for the Triumph ore. |
| ***Environmental*** | - The Triumph orebody replicates the Bentley orebody which is in the same geological system. The Bentley ore is processed in the same process concentrator proposed for the Triumph ore.<br>- Mine waste rock characterisation and process tailings characterisation from the Triumph orebody will replicate those from the Bentley orebody.<br>- Mining operations will commence on the approval of Mining proposal submission application #68090 |
| ***Infrastructure*** | - There is current processing infrastructure in place at the Jaguar Operation; all other surface infrastructure and underground infrastructure specific to the Triumph Mine has been allowed for in design and costing.<br>- This includes allowances for all earthworks, mine services, and all underground infrastructure as well as primary ventilation fans, escape ways, high voltage power reticulation, service water and compressed air. |
| ***Costs*** | - Capital costs for decline development and accesses were included in the financial evaluation.<br>- Other capital such as surface and underground infrastructure have been included in the financial evaluation.<br>- Operating costs for mining were modelled on recent contractor mining rates provided for a site employing the same mining method and a similar style of ore deposit, and have been benchmarked against the adjacent Bentley Mine.<br>- The operating processing costs have been provided by IGO and are based on their current operation.<br>- Exchange rates have been estimated and provided by IGO.<br>- Transportation charges have been provided by IGO and included in the NSR calculation.<br>- Concentrate payables, which includes accounting for any deleterious elements, have been calculated and used within the NSR evaluation process. |
| ***Revenue Factors*** | - During the calculation of Ore Reserves, the metal prices and exchange rates were time based for the life of the project.<br>- The time-based commodity price ranges are:<br>  - Copper price of USD 5,500/t - 6,474/t,<br>  - Zinc price of USD 2,485/t -2,773/t,<br>  - Silver price of USD 17.6/oz – 19.5/oz<br>  - Gold price of USD 1,227/oz - 1,300/oz.<br>- The foreign exchange rate ranges from AU$1.00 : US$0.73 and AU$1.00 : US$0.76. |
| ***Market assessment*** | - The volume and high quality of concentrate produced is expected to continue to attract a ready market domestically and internationally. |
| ***Economic*** | - The Ore Reserve mining plan shows a positive cashflow.<br>- The confidence in the inputs is consistent with the assigned Proved and Probable classifications of the Ore Reserve.<br>- Confidence in the economic inputs is appropriate to the level of study given that the mining cost inputs are from recent operations in combination with current costs from the Bentley operation.<br>- Economic inputs for processing and revenue were provided by IGO and assume treatment at the adjacent Jaguar Processing Facility.<br>- Sensitivity analysis work has been undertaken on variables such as mining costs, processing costs, foreign exchange rate and metal price, with the NPV proving most sensitive to changes in the commodity price and exchange rate. |

| Criteria | Comments |
|---|---|
| ***Social*** | - Mining operations will commence on the approval of a Mining proposal submission.<br>- The Competent Person understands that there are no foreseen impediments to IGO receiving the necessary approvals to commence mining as planned. |
| ***Other*** | - There are no foreseeable risks associated with the Triumph Operation expected to impact on the Ore Reserve.<br>- Mining operations will commence on the approval of Mining proposal submission application #68090.<br>- Triumph is situated within IGO's mining leases M37/44, M37/1301 and M37/1153. |

# Appendix C – Drilling Results Tables

## Triumph Drilling Results

| Drill Hole Name | Drill Hole Collar Location | | | Orientation | | Down Hole Depth Information | | | Intercept True Width | Intercept Grades | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | East (mE) | North (mN) | Elev. (mRL) | Azim. (°) | Dip. (°) | Total Depth (m) | Depth From (m) | Depth To (m) | (m) | Zn (%) | Cu (%) | Pb (%) | Ag (g/t) | Au (g/t) |
| 16TMDD001 | 10,124.3 | 62,032.5 | 4,480.8 | 90.0 | -60.0 | 757.0 | 683.1 | 696.48 | 11.53 | 7.9 | 0.10 | 0.30 | 76 | 0.20 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 5.86 | 14.3 | 0.20 | 0.40 | 129 | 0.40 |
| 16TMDD002 | 10,163.3 | 62,488.6 | 4,484.5 | 90.0 | -65.0 | 808.0 | 684.30 | 698.50 | 11.42 | 3.3 | 0.02 | 0.10 | 8 | 0.03 |
| 16TMDD003 | 10,329.1 | 62,435.2 | 4,483.2 | 65.0 | -61.0 | 413.7 | 327.57 | 360.50 | 23.27 | 7.5 | 0.50 | 1.00 | 161 | 0.30 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 15.56 | 10.5 | 0.50 | 1.30 | 214 | 0.30 |
| 16TMDD004 | 10,329.0 | 62,435.2 | 4,483.3 | 65.0 | -65.0 | 468.8 | 365.95 | 417.60 | 34.13 | 9.2 | 0.20 | 1.20 | 209 | 0.70 |
| 16TMDD005 | 10,330.7 | 62,435.2 | 4,483.3 | 65.0 | -58.0 | 363.6 | 297.47 | 321.00 | 17.12 | 4.5 | 1.10 | 0.40 | 85 | 0.40 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 9.08 | 5.6 | 1.5 | 0.40 | 85 | 0.60 |
| 16TMDD006 | 10,315.6 | 62,366.7 | 4,482.7 | 67.0 | -61.0 | 459.7 | 379.60 | 418.11 | 26.58 | 6.50 | 0.70 | 0.30 | 107 | 0.30 |
| 16TMDD007 | 10,315.9 | 62,336.7 | 4,482.7 | 67.0 | -58.0 | 405.5 | 334.50 | 370.00 | 27.33 | 5.40 | 0.20 | 0.30 | 59 | 0.20 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 14.05 | 7.30 | 0.10 | 0.60 | 86 | 0.30 |
| 16TMDD009 | 10,345.6 | 62,520.1 | 4,484.1 | 68.0 | -67.0 | 380.3 | 293.70 | 300.00 | 3.90 | 11.2 | 0.10 | 1.20 | 64 | 0.70 |
| ~ | ~ | ~ | ~ | ~ | ~ | And: | 313.70 | 318.31 | 2.95 | 10.0 | 0.01 | 0.90 | 90 | 0.20 |
| ~ | ~ | ~ | ~ | ~ | ~ | And: | 330.89 | 342.88 | 7.47 | 5.0 | 0.20 | 0.30 | 23 | 0.10 |
| 16TMDD011 | 10,347.4 | 62,520.0 | 4,484.2 | 68.0 | -61.0 | 366.6 | 267.30 | 326.50 | 39.40 | 9.5 | 0.60 | 0.40 | 140 | 0.40 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 22.99 | 13.9 | 0.90 | 0.50 | 191 | 0.40 |
| 16TMDD013 | 10,312.2 | 62,366.5 | 4,482.8 | 66.0 | -65.0 | 466.8 | 424.60 | 441.40 | 11.11 | 4.8 | 0.30 | 0.20 | 43 | 0.20 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 4.10 | 7.1 | 0.30 | 0.20 | 26 | 0.10 |
| 16TMDD014 | 10,346.0 | 62,520.0 | 4,484.2 | 68.0 | -58.0 | 345.6 | 270.00 | 277.20 | 5.15 | 18.2 | 0.10 | 0.80 | 158 | 0.40 |
| ~ | ~ | ~ | ~ | ~ | ~ | And: | 432.00 | 438.30 | 6.09 | 1.8 | 1.00 | 0.04 | 87 | 0.20 |
| 16TMDD015 | 10,319.1 | 62,366.4 | 4,482.8 | 66.0 | -54.0 | 369.5 | 316.50 | 346.50 | 24.43 | 1.60 | 0.70 | 0.03 | 17 | 0.10 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 2.68 | 6.4 | 0.50 | 0.10 | 28 | 0.20 |

*Notes:*

- *Grid coordinates are Jaguar local mine grid.*
- *Intercept grade results are length and density weighted for included samples.*
- *Width is true width estimated from the mineralisation dip and drill hole intersection angle.*

## Bentayga Drill Results

| Drill Hole Name | Drill Hole Collar Location | | | Orientation | | Down Hole Depth Information | | | Intercept | Intercept Grades | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | East (mE) | North (mN) | Elev. (mRL) | Azim. (°) | Dip. (°) | Total Depth (m) | Depth From (m) | Depth To (m) | True Width (m) | Zn (%) | Cu (%) | Pb (%) | Ag (g/t) | Au (g/t) |
| 17BUDD003 | 9,527 | 50,873 | 3,623 | 144.1 | -34.1 | 585.4 | 539.8 | 555.3 | 9.7 | 20.0 | 0.8 | 3.1 | 534 | 3.2 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 6.5 | 27.1 | 1.0 | 4.2 | 712 | 4.2 |
| 17BUDD004 | 9,499 | 50,901 | 3,531 | 148.0 | -43.0 | 645.4 | 527.4 | 587.0 | 9.0 | 3.3 | 1.0 | 0.6 | 113 | 0.4 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 3.4 | 7.0 | 1.2 | 1.4 | 201 | 0.3 |
| 17BUDD005 | 9,562 | 50,711 | 3,480 | 153.0 | -38.0 | 885.7 | 755.2 | 760.0 | 3.0 | 7.8 | 0.1 | 1.5 | 60 | 0.1 |
| 17BUDD006 | 9,202 | 50,880 | 3,589 | 147.0 | -38.0 | 601.7 | 548.4 | 557.0 | 5.4 | 9.5 | 0.4 | 0.9 | 208 | 0.8 |
| ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | Including: | 4.0 | 12.0 | 0.4 | 1.2 | 264 | 1.0 |
| 17BUDD006W1 | 9,504 | 50,898 | 3,589 | 141.0 | -58.0 | 280.7 | 159.5 | 167.7 | 6.2 | * | * | * | * | * |
| 17BUDD014 | 9,555 | 50,838 | 3,685 | 144.0 | -27.0 | 674.3 | 547.0 | 557.4 | 7.1 | 1.1 | 0.0 | 0.4 | 86 | 0.2 |
| 17BUDD015 | 9,522 | 50,975 | 3,637 | 139.0 | -37.0 | 594.0 | x | x | x | x | x | x | x | x |
| 17BUDD016 | 9,536 | 50,835 | 3,644 | 149.0 | -31.0 | 566.1 | 568.7 | 568.7 | 1.9 | * | * | * | * | * |

*Notes:*

- *Intercept average results are length and density weighted from included samples.*
- *Width is true width estimated from the mineralisation dip and drill hole intersection angle.*
- *indicates massive sulphides have been intersected by assay results are still pending from the laboratory.*
- *'x' indicates this hole has no significant intercepts of mineralisation to report.*