10 December 2018

Frieda River Copper-Gold Project Ore Reserve Update

The 2018 Horse-Ivaal-Trukai, Ekwai and Koki (HITEK) Ore Reserve estimate for the Frieda River Copper-Gold Project at September 2018 is reported according to the 2012 edition of the *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* (the JORC Code). The 2018 HITEK Ore Reserve is supported by the Sepik Development Project Feasibility Study (Feasibility Study) completed in 2018. This Ore Reserve estimate replaces the 2017 HITEK Ore Reserve estimate.

The HITEK Ore Reserve is summarised in the following table.

2018 HITEK Ore Reserve vs 2017 HITEK Ore Reserve

	2017 HITEK Ore Reserve			2018 HITEK Ore Reserve		
Class	**Tonnes (Mt)**	**Copper grade (%)**	**Gold grade (g/t)**	**Tonnes (Mt)**	**Copper grade (%)**	**Gold grade (g/t)**
Proved	413	0.54	0.32	604	0.51	0.30
Probable	272	0.45	0.21	761	0.42	0.21
Total	**686**	**0.50**	**0.28**	**1,365**	**0.46**	**0.25**

2018 Ore Reserve notes:

(i) Estimated at commodity prices of US$3.30/lb copper and US$1,390/oz gold

(ii) Reported using a breakeven economic cut-off value that considers relevant modifying factors

(iii) Reported on a 100% ownership basis

(iv) The tonnes and grades are stated to a number of significant digits reflecting the confidence of the estimate. Since each number and total is rounded individually, the table may show apparent inconsistencies between the sum of rounded components and the corresponding rounded total.

Blocks classified as Measured or Indicated Mineral Resource with a positive economic value are selected as ore. The cut-off value used to define the Ore Reserve was applied on a net smelter return (NSR) basis which incorporates realisation costs, metallurgical recovery, ore processing and general and administrative costs. The breakeven NSR differentiates ore from waste rock on a static unscheduled basis. Material having a positive value represents a net positive cash flow increment that supports its reporting in the Ore Reserve. The Ore Reserve is defined at the point at which ore is delivered to the planned HITEK process plant.

A mine production schedule for the HITEK deposit, the Ore Reserve schedule, was prepared for the purpose of verifying the declaration of the Ore Reserve estimate. Only Measured and Indicated Mineral Resource classifications within the design open-pit were accepted as mill feed. All Inferred Mineral Resource was treated as waste rock.

Economic evaluation of the Ore Reserve schedule including all relevant modifying factors, project capital and operating costs demonstrates technical and economic extraction of the portion of the Measured and Indicated Mineral Resource within the open-pit design. Measured and Indicated Mineral Resources were converted to Proved and Probable Ore Reserve classifications, respectively. The economic evaluation yielded a positive net present value (NPV) at US$3.30 per pound (lb) copper and US$1,390 per ounce (oz) gold.

The HITEK Ore Reserve is based on a feasibility study with the following key characteristics:

- Proved and Probable Ore Reserve classifications utilised in the mine plan;
- Ore Reserves reported from within the HITEK open-pit design;
- A mine production schedule targeting highest value mill feed;
- Frieda River Copper Gold Project (FRCGP) ownership of the Frieda River Hydroelectric Project, with supply of power equal to the cost of generation;
- Revenue from power sales to third parties following cessation of mining at the FRCGP in Year 35;
- FRCGP funding and ownership of shared-use infrastructure including the road connecting Vanimo and Hotmin, the Port of Vanimo, and the Green River Airport;
- Leasing of initial primary mine mobile equipment fleet; and
- A commercial build, own, operate (BOOT) arrangement for the concentrate pipeline from the mine site to the Port of Vanimo.

Comparison to previous estimates

An Ore Reserve was declared in 2017 supported by the 2016 FRCGP Feasibility Study and 2017 Addendum. The material increase between the 2017 and 2018 estimates is supported by several key scope enhancements (in order of impact on the Ore Reserve estimate):

- Relocation of the integrated storage facility (ISF) from the Nena River to the Frieda River:
  - significantly increases the reservoir storage from 0.9Bm^3 to 3.3Bm^3 enabling greater mine waste rock and process tailings storage capacity and future mine life extensions beyond 33 years
  - enables up to 490MW of firm hydroelectric power generation capacity with the potential to export surplus power compared to the 2016 study which generated up to 102MW
  - lowers the power cost from the blended intermediate fuel oil and hydroelectric power cost of US¢6.5/kWh in 2017 to US¢1.3/kWh which significantly reduces the process operating cost.
- Expansion of the HITEK process plant (Stage 2) from a peak of 49Mtpa to 65Mtpa in Year 8 of operations compared to 40Mtpa previously:
  - Increases revenue in Years 10 to 15 to offset strip ratio and mine waste cost increases enabling economic expansion beyond the original 18 years

- Maintains annual cash flows through to Year 15 before the increasing strip ratio and decreasing head grade combine to reduce annual cash flow.

Summary financial assumptions and results for the Ore Reserves case are presented below in the table below.

Description	Unit	Life of Mine
C1 cash cost (after by-product credits)	US$/lb copper	0.93
AISC (after by-product credits)	US$/lb copper	1.23
Annual net profit after tax (NPAT)	US$ million (US$M)	290
Post-tax NPV (8% real discount rate)	US$M	275
Post-tax free cash flow	US$M	29,995
Pre-production capital	US$M	6,390
Development capital	US$M	365
Sustaining capital over LOM	US$M	1,955
Capital intensity	US$/t capacity	34,580
Project IRR (real terms)	%	8.4
Payback period (post-production)	years	7
Total on-site operating cost	US$/t processed	11.78
Total production cost	US$/t processed	15.04
Average copper recovery	%	86
Average gold recovery	%	67
Average annual copper in concentrate	ktpa	155
Average annual gold in concentrate	kozpa	210
Average mill feed	Million tonnes (Mt)	39
Average waste mined	Mt	44
Strip ratio (waste:ore)	ratio	1.16
Average paid power price	US cents/kWh	2.1

Mineral Resource Estimation

The HITEK Mineral Resource estimate is unchanged from May 2017 as no new data has been collected or interpretation has occurred. Mr Shaun Versace is the Competent Person for the Mineral Resource estimate report. Mr Versace is a Member of the Australasian Institute of Mining and Metallurgy and a full time employee of PanAust Limited (PanAust). Frieda River Limited (FRL) is a wholly-owned subsidiary of PanAust. FRL is a participant in an unincorporated joint venture with Highlands Frieda Limited, a wholly-owned subsidiary of Highlands Pacific Limited. FRL manages the Project and holds an 80% interest; Highlands holds the remaining 20% interest.

The Mineral Resource estimate is derived from an ordinary kriged model rotated 60 degrees west from true north. Drilling at HITEK includes 815 drill holes of which 537 (162,504m) are sufficiently verified by quality assurance and quality control (QAQC) measures on key data, including copper and gold assay grades, to be used for Mineral Resource estimation. At Horse-Ivaal-Trukai (HIT) the drilling sections are aligned 030° from true north with a spacing of approximately 75m x 75m in the most intensively drilled parts of the deposit. This drill hole spacing generally resulted in a Measured classification. Spacing varies vertically due to drill holes being orientated in fan patterns from helicopter accessible platforms cut into the steep terrain, with a more uniform spacing at depth. A minor number of drill holes are at various orientations to the grid to test for directional bias and intrusive bodies that may strike parallel to the drilling grid. Drilling at the Ekwai and Koki porphyry deposits is aligned 080° with a spacing in the most intensively drilled parts of the deposits of approximately 90m x 70m at Ekwai and 140m x 70m at Koki. This drill hole spacing generally resulted in an Indicated classification.

Estimation domains were defined using observed geology along with assumptions based on geological and grade continuities observed at deposits of similar type. The copper, gold, silver, arsenic, antimony, density, total sulphur, copper oxide grade and point load index (Is50) values were estimated using ordinary kriging on typically four metre composites into a parent block size of 25m x 25m x 15m with sub blocks of 5m x 5m x 5m to provide adequate resolution along domain boundaries. Rock quality designation (RQD) was assigned to blocks based on their weathering, lithology, alteration and whether above or below the gypsum/anhydrite dissolution surface (GAS, a zone approximately 300m deep, below the weathering, where sulphates that bind the rock are typically present below and absent above).

Estimates for HITEK were performed in passes with the pass number informing the Mineral Resource classification. At HIT, the highest passes for copper, gold and density are classified as Measured. Indicated has a one-lower pass and Inferred has at a minimum, estimates for copper and gold, and an assigned density. At Ekwai and Koki, classification solids have been created in order to exclude some well-drilled areas containing drill holes from early phases.

The Mineral Resource model is regularised to a standard block size of 25m x 25m x 15m for downstream mine engineering work. The Mineral Resource estimate is inclusive of those Mineral Resources modified to produce the Ore Reserve

Cut-Off

The cut-off value used to define the Ore Reserve was applied on a NSR basis and incorporates revenue calculations, realisation costs, metallurgical recovery, ore processing and general and administrative costs. A breakeven NSR differentiates ore from waste rock on a static unscheduled basis. Measured and Indicated blocks with a positive economic value were selected as ore and reported in the Ore Reserve.

Mining

The HITEK deposit will be developed as a large-scale conventional open-pit mine with 15m high benches at Horse-Ivaal-Trukai (HIT) and 10m benches at Ekwai and Koki. The majority of the ore and waste material will be drilled and blasted before being excavated by electric-hydraulic shovels and excavators. Mined ore and waste rock will be hauled to the open-pit rim, delivered to separate primary crushers and conveyed to either the process plant (ore) or barge loading facility (waste). A small portion of open-pit waste material will be hauled to surface dumps based on its material properties.

Ore will be fed into a conventional comminution and flotation process plant to produce a copper-gold concentrate for export to custom smelters. Waste rock and process tailings will be stored subaqueously within an engineered integrated storage facility (ISF). Workshop, warehouse, office and refuelling infrastructure will be established to support mining activities.

Slope design recommendations for final open-pit walls were provided by an independent third party. Slope design parameters are supported by drill hole information, acoustic televiewer surveys, geotechnical mapping and field observations. The slope design parameters were applied to the open-pit optimisation and design used for the Ore Reserve estimate.

Water diversion structures and a water treatment facility were incorporated into the mine design to accommodate the high annual rainfall and expected water quality.

The Mineral Resource model incorporates an allowance for dilution. Two dilution sources are considered:

- Diluted block grades from the estimated proportion of barren intrusions
- Internal dilution as an effect of the re-blocking process used to construct the mine planning model.

The combined dilution within the mine planning model resulting from these factors is estimated to be 5%.

The Ore Reserve is not modified to account for ore loss. The mineralisation is modelled as a large and homogeneous deposit with limited ore and waste boundaries within the open-pit design. Planned close spaced grade control drilling prior to mining will be used to minimise potential ore loss and dilution. Grade control drilling will provide greater confidence in the Inferred Mineral Resource material within the open-pit design with the goal of converting the Inferred Mineral Resource to mill feed.

The Ore Reserve was estimated within an open-pit design prepared by PanAust's technical services group and supported by external consultants. Optimisation of the open-pit limits was completed using the Lerchs Grossman algorithm as implemented in Geovia's Whittle software and was verified using alternative software packages. The open-pit optimisation process only considered Measured and Indicated Mineral Resource. The open-pit optimisation generated a range of open-pit shells that represented tonnage and corresponding value increments.

The pit optimisation shell selected for open-pit design corresponds to a copper price of US$2.90/lb and a gold price of US$1,276/oz for the larger HIT deposit and a copper price of US$2.05/lb and a gold price of US$899/oz for the smaller Ekwai and Koki deposits.

A detailed open-pit design was prepared from the selected open-pit shells and used for Ore Reserve estimation. The open-pit design includes 50m wide ramps and safety berms on the open-pit walls to accommodate the selected mine fleet.

No minimum mining width was specified in the open-pit optimisation. The open-pit design process considered access and allowed sufficient working area to accommodate large mining equipment. Smaller mining fleets will be used for pre-stripping and mining areas with a narrower mining width.

A life of mine (LOM) production schedule was prepared using the 2018 open-pit design and mine planning model that forms the basis for the Ore Reserve estimate. The production schedule demonstrates that ore can be delivered to the process plant in sufficient quantity each year over the mine life to satisfy the assumptions associated with the costs and revenues used in the Ore Reserve estimate. The waste movement required to extract the Ore Reserve is 1,570Mt.

The Inferred Mineral Resource was not considered for conversion to Ore Reserve.

Measured and Indicated Mineral Resource classifications were converted to Proved and Probable Ore Reserve classifications, respectively.

Processing

The metallurgical process design is appropriate for treatment of porphyry copper-gold mineralisation. The flowsheet is similar to that used successfully at PanAust's Phu Kham Copper-Gold Operation in Laos.

The process plant design and technology is conventional and consists of crushing, grinding, and sulphide flotation processes for the production of a copper-gold concentrate having an approximate average grade of 26% copper. The design and the equipment are proven and consistent with existing operations treating large porphyry deposits throughout the world.

Extensive metallurgical test work was undertaken for materials characterisation (hardness, mineralogy, mineral liberation) and process development on variability samples representing the major weathering, lithology and alteration units. This characterisation determined two metallurgical ore types; oxidised and primary. These ore types are defined by the content of acid soluble copper as a proportion of the total copper content (CuOx%). The oxidised ore type contains greater than or equal to 3% CuOx% while primary ore contains less than 3% acid soluble copper.

Metallurgical recovery factors are applied to both ore types. The oxidised ore copper recovery is a function of acid soluble copper and pyrite content, as estimated by the sulphur to copper ratio. The oxidised ore gold recovery is proportional to copper recovery with a similar function applied. The primary ore copper and gold recoveries were determined from test work and found to be within a tight band of results, hence a fixed recovery for copper and gold is applied.

Metallurgical test work indicates that concentrate will be low in deleterious elements and will not attract penalty charges. The copper concentrate is expected to be attractive to custom smelters. Bench and pilot scale test work on large ore type composites and period composites confirmed the results of the variability test work.

Infrastructure

The Project is a greenfield site with no road, power, water and ground transport infrastructure. Limited road and ocean port infrastructure is available outside the Project area. The Project area is sparsely populated with sufficient land available for development.

All infrastructure necessary to establish and support the Project was identified, designed and costed during the 2018 Feasibility Study. The cost to construct the necessary infrastructure was included in the discounted cashflow model that was used to validate the Ore Reserve estimate.

Licences and Permitting

The HITEK deposits are located within Exploration License 58 in the Sandaun province of PNG. The exploration license is held by the Frieda River Joint Venturers and has been renewed on numerous occasions. The region experiences high rainfall and occasional elevated seismicity events. Geohazards are present in the immediate Project area. There are no other significant naturally occurring risks.

There are no material legal or marketing arrangements.

An application for a Special Mining Lease (SML) was submitted by the Frieda River Joint Venturers in June 2016. It is intended that the 2018 Feasibility Study will support an amendment to the 2016 SML application, and a separate application for environmental permits, subject to approval by the Frieda River Joint Venturers. These applications will form the basis for obtaining the necessary mining tenements and associated development agreements.

There are reasonable grounds to expect that the necessary government approvals will be received.

For further information, please contact:
Joe Dowling, Stockwork Corporate - 0421 587 755

Competent Person. Ore Reserves

The data in this report that relate to Ore Reserves for the Frieda River Copper-Gold Project are based on information reviewed by Mr Scott Cowie who is a Member and Chartered Professional (Mining) of the Australasian Institute of Mining and Metallurgy (MAusIMM(CP)). Mr Cowie is a full-time employee of PanAust Limited. Mr Cowie has sufficient experience relevant to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Cowie consents to the inclusion in the report of the Ore Reserves in the form and context in which they appear.

Competent Person Statement. Mineral Resources

The data in this report that relate to Mineral Resources for Frieda River (HITEK and Nena) are based on information reviewed by Mr Shaun Versace who is a Member of the Australasian Institute of Mining and Metallurgy (MAusIMM). Mr Versace is a full-time employee of PanAust Limited. Mr Versace has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Versace consents to the inclusion in the report of the Mineral Resources in the form and context in which they appear.

Forward Looking Statements

All statements other than statements of historical fact included in this announcement including, without limitation, statements regarding future plans and objectives of Highlands Pacific Limited are forward-looking statements. When used in this announcement, forward-looking statements can be identified by words such as 'may', 'could', 'believes', 'estimates', 'targets', 'expects' or 'intends' and other similar words that involve risks and uncertainties.

These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions regarding future events and actions that, as at the date of this announcement, are expected to take place. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of the company, its directors and management of Highlands Pacific Limited that could cause Highlands Pacific Limited's actual results to differ materially from the results expressed or anticipated in these statements.

Highlands Pacific Limited cannot and does not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will actually occur and investors are cautioned not to place undue reliance on these forward-looking statements. Highlands Pacific Limited does not undertake to update or revise forward-looking statements, or to publish prospective financial information in the future, regardless of whether new information, future events or any other factors affect the information contained in this announcement, except where required by applicable law and stock exchange listing requirements.

ASX Code: HIG
POMSoX Code: HIG
Shares on Issue: 1,093 million
Performance Rights: Nil

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About Highlands Pacific Limited
Highlands Pacific is a PNG incorporated and registered mining and exploration company listed on the ASX and POMSoX. Its major assets are interests in the producing Ramu nickel cobalt mine and the Frieda River copper gold project; with exploration in progress in the Star Mountains. Highlands also has exploration tenements at on Normanby Island (Sewa Bay).

Ramu Nickel Cobalt Mine
The producing Ramu nickel cobalt mine is located 75km west of the provincial capital of Madang, PNG. Highlands holds an 8.56% interest in the Ramu project that will increase to 11.3% at no cost to Highlands once Highlands' share of Ramu project debt is repaid to the project manager and joint venture partner Metallurgical Corporation of China (MCC).

Star Mountains Prospects
The Star Mountains exploration tenements are located approximately 20km north of the Ok Tedi mine, in the West Sepik Province, PNG. They lie within the highly prospective New Guinean Orogenic Belt, which hosts the Grasberg, Ok Tedi, Porgera and Hidden Valley mines, as well as the Frieda deposit.

Frieda River Copper/Gold Project
The Frieda River copper gold project is located 175km north-west of the Porgera gold mine and 75km north-east of the Ok Tedi mine. Highlands has a 20% interest in the project and Frieda River Limited (a wholly owned subsidiary of PanAust Limited which in turn is a wholly owned subsidiary of Guangdong Rising Assets Management Co. Ltd.) has 80%.

JORC Table 1
Section 4 Estimation and Reporting of Ore Reserves

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• *Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.* • *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.*	The Horse-Ivaal-Trukai-Ekwai-Koki (HITEK) Mineral Resource estimate is unchanged from May 2017 as no new data has been collected or interpretation has occurred. Mr Shaun Versace is the Competent Person for the Mineral Resource estimate report. Mr Versace is a Member of the Australasian Institute of Mining and Minerals and a full time employee of PanAust Limited (PanAust). Frieda River Limited (FRL) is a wholly-owned subsidiary of PanAust. FRL is a participant in an unincorporated joint venture with Highlands Frieda Limited, a wholly-owned subsidiary of Highlands Pacific Limited. FRL manages the Project and holds an 80% interest; Highlands holds the remaining 20% interest. The Mineral Resource is an Ordinary Kriged model rotated 60 degrees west from true north. Drilling at HITEK includes 815 drill holes of which 537 (162,504m) are sufficiently verified by quality assurance and quality control (QAQC) measures on key data, including copper and gold assay grades, to be used for Mineral Resource estimation. At Horse-Ivaal-Trukai (HIT) the drilling sections are aligned 030° from true north with a spacing of approximately 75m x 75m in the most intensively drilled parts of the deposit. This drill hole spacing generally resulted in a Measured classification. Spacing varies vertically due to drill holes being drilled in fan patterns from helicopter accessible drill pads cut into the steep terrain, with a more uniform spacing at depth. A minor number of drill holes are at various orientations to the grid to test for directional bias and intrusives that may strike parallel to the drilling grid. Drilling at the Ekwai and Koki porphyries are aligned 080° with a spacing in the most intensively drilled parts of the deposits of approximately 90m x 70m at Ekwai and 140m x

Criteria	JORC Code explanation	Commentary
		70m at Koki. This drill hole spacing generally resulted in an Indicated classification. Estimation domains were defined using observed geology along with assumptions based on geological and grade continuities observed at deposits with of similar type. The copper, gold, silver, arsenic, antimony, density, total sulphur, copper oxide grade and point load index (Is_{50}) values were estimated using ordinary kriging on typically four metre composites into a parent block size of 25m x 25m x 15m with sub blocks of 5m x 5m x 5m to provide adequate resolution along domain boundaries. Rock quality designation (RQD) was assigned to blocks based on their weathering, lithology, alteration and whether above or below the gypsum/anhydrite dissolution surface (GAS, a zone approximately 300m deep, below the weathering, where sulphates that bind the rock are typically present below and absent above). Estimates for HITEK were performed in passes with the pass number informing the Mineral Resource classification. At HIT, the highest passes for copper, gold and density are classified as Measured. Indicated has a one-lower pass and Inferred has at a minimum, estimates for copper and gold, and an assigned density. At Ekwai and Koki, classification solids have been created in order to exclude some well-drilled areas containing drill holes from early phases. The Mineral Resource model is regularised to a standard block size for downstream mine engineering work to a block size of 25m x 25m x 15m. This model is called the mine planning model (file name: FRL_HITEK_V3_25x25x15_20180515_v1). The process and assumptions used to convert the Mineral Resource to an Ore Reserves is detailed in the Technical Summary (Appendix 1). The Mineral Resource is inclusive of those Mineral Resources modified to produce the Ore Reserve.

Criteria	JORC Code explanation	Commentary
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	PanAust staff responsible for the preparation of the Ore Reserve estimate made several visits to the Frieda River Copper-Gold Project (Project) area. The Competent Person for the Ore Reserve has visited the Frieda River project area on three or more occasions to view drill core, assess the site conditions, determine pioneering access routes, consider water management alternatives, inspect the terrain and identify suitable locations for mining and infrastructure locations.
Study status	• *The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.* • *The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.*	The Ore Reserve is supported by the Sepik Development Project Feasibility Study (Feasibility Study) completed in September 2018. The Feasibility Study generated detailed designs and cost estimates, a life of mine (LOM) production plan and cash flow model that demonstrated a technically achievable and economically viable mine plan. The Project will be developed at a greenfield site based on the mining and processing of a portion of the HITEK porphyry copper-gold deposits. The Nena epithermal copper-gold deposit is considered in the Project from a strategic development perspective. A scoping study was completed on the Nena deposit in 2018. An Ore Reserve is therefore not being declared for Nena.
Cut-off parameters	• *The basis of the cut-off grade(s) or quality parameters applied.*	The cut-off value used to define the Ore Reserve was applied on a NSR basis and incorporates revenue calculations, realisation costs, metallurgical recovery, ore processing and general and administrative costs. A breakeven NSR differentiates ore from waste rock on a static unscheduled basis. Mineralised blocks with a positive economic value were selected as ore and reported in the Ore Reserve. The Ore Reserve is defined at the point at which ore is delivered to the HITEK process plant.

Criteria	JORC Code explanation	Commentary
		Mining costs are not included in this analysis on the basis that any block within the final pit would be removed with its extraction and processing costs covered by either its own extraction or that of a deeper block. Hence the economically mineable material comprises all mineralised material that, when delivered to the pit rim, has a recovered value greater than the cost of all downstream site costs, concentrate transport and realisation charges. Silver is not included in the Ore Reserve because the estimated average concentrate grade was below the industry payable threshold of 30g/t silver in concentrate.
Mining factors or assumptions	• *The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (ie either by application of appropriate factors by optimisation or by preliminary or detailed design).* • *The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.* • *The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.*	The HITEK deposits will be developed as a large-scale conventional open-pit mine using truck and shovel with 15m high benches at Horse-Ivaal-Trukai (HIT) and 10m benches at Ekwai and Koki. The majority of the ore and waste material is drilled and blasted before being excavated by electric-hydraulic shovels and excavators. Mined ore and waste rock will be hauled to the open-pit rim, delivered to separate primary crushers and conveyed to either the process plant (ore) or barge loading facility (waste). A small portion of open-pit waste material will be hauled to surface dumps based on its material properties. Ore will be fed into a conventional comminution and flotation process plant producing a copper-gold concentrate for export to custom smelters. Waste rock and process tailings will be stored subaqueously within an engineered integrated storage facility (ISF). Workshop, warehouse, office and refuelling infrastructure will be established to support mining activities. Slope design recommendations for final open-pit walls were provided by a third party expert. Slope design parameters are supported by drill hole information, acoustic televiewer surveys, geotechnical mapping and field

Criteria	JORC Code explanation	Commentary
	• *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).* *The mining dilution factors used.* • *The mining recovery factors used.* • *Any minimum mining widths used.* • *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* • *The infrastructure requirements of the selected mining methods.*	observations. The slope design parameters were applied to the open-pit optimisation and design used for the Ore Reserve estimate. Water diversion structures and a water treatment facility were incorporated into the mine design to accommodate the high annual rainfall and expected water quality. The Mineral Resource model incorporates an allowance for dilution. Dilution is made up from two sources: • Dilution block grades from the estimated proportion of barren intrusions (Flimtem Trachyandesite • Internal dilution as an effect of the re-blocking process used to construct the mine planning model. The combined dilution within the mine planning model resulting from these factors is estimated to be 5%. The Ore Reserve is not modified to account for ore loss. The mineralisation is present as a large and homogeneous deposit. There are limited ore and waste boundaries within the open-pit design. Planned close spaced grade control drilling prior to mining will be used to minimise potential ore loss and dilution. The Ore Reserve was estimated within an open-pit design prepared by PanAust's technical services group and external consultants in the period 2016 to 2018. Optimisation of the open-pit limits was completed using the Lerchs Grossman algorithm as implemented in Geovia's Whittle software and was verified using Maptek OptiPit and AVCS MaxFlow software. The open-pit optimisation process only considered Measured and Indicated Mineral Resource. The open-pit optimisation generated a range of open-pit shells that represented tonnage and corresponding value increments. The open-pit shell selected for open-pit design corresponds to a copper price of US$2.90/lb and a gold price of US$1,276/oz for the larger HIT

Criteria	JORC Code explanation	Commentary
		deposit and a copper price of US$2.05/lb and a gold price of US$899/oz for the smaller Ekwai and Koki (EK) deposits. A detailed open-pit design was prepared from the selected open-pit shells and used for Ore Reserve estimation. The open-pit design includes 50m wide ramps and safety berms on the open-pit walls to accommodate the selected mine fleet. No minimum mining width was specified in the open-pit optimisation. The open-pit design process considered access and allowed sufficient working area to accommodate large mining equipment. Smaller mining fleets will be used for pre-stripping and mining areas with a narrower mining width. A LOM production schedule was prepared in 2018 using the open-pit design and mine planning model that forms the basis for the Ore Reserve estimate. The production schedule demonstrates that ore can be delivered to the process plant in sufficient quantity each year over the mine life to satisfy the assumptions associated with the costs and revenues used in the Ore Reserve estimate. The waste movement required to extract the Ore Reserve is 1,570Mt. The Inferred Mineral Resource was not considered for conversion to Ore Reserve.

Criteria	JORC Code explanation	Commentary
Metallurgical factors or assumptions	• *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.* • *Whether the metallurgical process is well-tested technology or novel in nature.* • *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* • *Any assumptions or allowances made for deleterious elements.* • *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.* • *For minerals that are defined by a specification, has the Ore Reserve estimation been based on the appropriate mineralogy to meet the specifications?*	The metallurgical process design is appropriate for treatment of porphyry copper-gold mineralisation. The flowsheet is similar to that used successfully at PanAust's Phu Kham Copper-Gold Operation in Laos. The process plant design and technology is conventional and consists of crushing, grinding, and sulphide flotation processes for production of a copper-gold concentrate having an approximate average grade of 26% copper. The design and the equipment are proven and consistent with existing operations treating large porphyry deposits throughout the world. Extensive metallurgical test work was undertaken for materials characterisation (hardness, mineralogy, mineral liberation) and process development on variability samples representing the major weathering, lithology and alteration units. This characterisation determined two metallurgical ore types; oxidised and primary. These ore types are defined by the content of acid soluble copper as a proportion of the total copper content (CuOx%). The oxidised ore type contains greater than or equal to 3% CuOx% primary ore contains less than 3% acid soluble copper. Metallurgical recovery factors are applied to both ore types. The oxidised ore copper recovery is a function of acid soluble copper and pyrite content estimated by the sulphur to copper ratio. The oxidised ore gold recovery is proportional to copper recovery with a similar function applied. The primary ore copper and gold recoveries were determined from test work and found to be within a tight band of results, hence a fixed recovery for copper and gold is applied. Metallurgical test work indicates that concentrate will be low in deleterious elements and will not attract penalty charges. The copper concentrate is expected to be attractive to custom smelters. Bench and pilot scale test work on large ore type composites and period composites confirmed the results of the variability test work.

Environmental	• *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.*	Comprehensive environmental baseline data has been collected over a period of eight years including terrestrial ecology, aquatic ecology, soil, water and sediment quality and the near-shore marine environment. Analysis and modelling of this data has informed a comprehensive Environmental Impact Statement (EIS) for the Project. The EIS was developed in accordance with PNG Government guidelines and an approved terms of reference. The key environmental issues requiring mitigation strategies are disturbance within the Frieda River Copper-Gold Project (Project) footprint, fugitive sediment emissions during construction and dissolved metal emissions during operations and closure. Important strategies for protecting the environment are the subaqueous deposition of mine waste rock and process tailings within an integrated storage facility (ISF) and active treatment of open-pit contact water. Environmental management strategies will be guided by standards implemented by PanAust Limited, an internationally recognised leader in environmental management and sustainability. Geochemical characterisation studies on waste rock were conducted between 2009 and 2011 for the HIT deposit and in 2016 for the Ekwai and Koki deposits. A substantial portion of the mined waste rock and process tailings is susceptible to acid and metalliferous drainage. These studies guided the development of the waste management strategy detailed in the Feasibility Study and adopted for the Project. The key strategies for limiting impact on the environment is the subaqueous deposition of mine waste rock and process tailings within the ISF and active treatment of open-pit water. The Project is designed to limit fugitive sediment emissions from the mine site and the potential for acid and metalliferous drainage using an ISF. The ISF is designed to Australian National Committee on Large Dams Incorporated (ANCOLD) guidelines. The ISF design is supported by

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		extensive modelling which shows no significant adverse long term impact on downstream water quality.The Project will meet the PNG Environment (Water Quality Criteria) Regulation 2002, World Health Organisation Drinking Water Standards, and the Australian and New Zealand Environment Conservation Council/Agriculture and Resource Management Council of Australia and New Zealand 2000 (ANZECC/ARMCANZ) guidelines for the protection of 95% of freshwater aquatic species in the Sepik River. A conceptual closure plan has been completed. The plan describes the proposed completion criteria, post-mining land use and post-closure management, monitoring and surveillance requirements.
Infrastructure	• *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.*	The Project is a greenfield site with no road, power, water and ground transport infrastructure. Limited road and ocean port infrastructure is available outside the Project area. The Project area is sparsely populated with sufficient land available for development. All infrastructure necessary to establish and support the Project was identified, designed and costed during the Feasibility Study. The cost to construct the necessary infrastructure was included in the discounted cashflow model that was used to validate the Ore Reserve estimate.

Costs	• *The derivation of, or assumptions made, regarding projected capital costs in the study.* • *The methodology used to estimate operating costs.* • *Allowances made for the content of deleterious elements.* • *The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co-products.* • *The source of exchange rates used in the study.* • *Derivation of transportation charges.* • *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.* • *The allowances made for royalties payable, both Government and private.*	Costs and revenue estimates were prepared during the Feasibility Study and are reported in real 2018 US dollars as at Q1 calendar 2018. The capital cost estimate comprises direct costs, indirect costs and a contingency amount. The estimates were derived using 3D models, drawings and sketches, construction productivity and installation rates, equipment prices, an indirect cost build-up from first principles and a quantitative cost and schedule risk analysis to estimate the contingency. The total capital cost used for the economic evaluation to verify the Ore Reserve is US$6.4 billion. Operating cost estimates were developed from first principles including but not limited to equipment productivities, usage rates for consumables, labour costs and general and administrative costs. The operating cost estimates are benchmarked against similar mining operations including PanAust's existing operations in Laos (Phu Kham and Ban Houayxai), Lihir and Ok Tedi. The Feasibility Study resulted in average life of mine operating costs of: • Mining: US$2.16/t ore mined (US$4.67/t processed) • Ore processing: US$4.02/t processed • Logistics: US$0.41/t processed • General and administrative: US$2.02/t processed • Realisation costs: US$1.30/t processed • Total production cost: US$12.43/t processed No cost penalties were applied for deleterious elements, based on test work results. Metal prices were based on the long term market assessment developed independently by Wood Mackenzie in June 2018. Exchange rates are based on prevailing rates as at Q1 calendar 2018. Transport charges were developed using a transport economic model which considered all inbound freight and outbound concentrate charges.

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		Smelting and refining charges were based on existing contract terms and PanAust's assessment of future copper concentrate sale terms and benchmarked using an independent report. A royalty of 2% from the gross revenue is required to be paid to the Government of PNG under the prevailing mining legislation. No private royalties are payable.
Revenue factors	• *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.* • *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.*	Revenue calculations were based on the Ore Reserve block model grades and calculated metallurgical recoveries for copper and gold, long term metal prices for copper and gold, and assumed contractual terms for treatment charges and metal payables. These values were incorporated into the NSR calculation and DCF model. Smelting and refining charges assumed in the Ore Reserve estimate were based on existing contract terms and PanAust's assessment of future copper concentrate sale terms. Revenue prices for copper (US$3.30/lb) and gold (US$1,390/oz) were used to prepare the Ore Reserve estimate based on Wood Mackenzie's independent long term market assessment.
Market assessment	• *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.* • *A customer and competitor analysis along with the identification of likely market windows for the product.* • *Price and volume forecasts and the basis for these forecasts.*	Copper concentrate is widely traded in international markets. PanAust has more than 10 years' experience in the copper concentrate market through its subsidiary company, Phu Bia Mining, which has established a strong market reputation for quality under long term sales contracts of copper concentrate. Industry analysts expect the copper market to be balanced until 2018 after which demand is forecast to exceed supply. The pipeline of supply from likely new mine developments and expansions is not considered sufficient to meet the projected demand by 2022. There is a need for significant new concentrate supply for the supply-demand balance to be restored beyond 2022. Hence analysts generally have a positive long term price outlook for copper.

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	• *For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.*	The Project will be competing against a number of greenfield and brownfield, in terms of the demand for refined copper and the requirement for new and incremental sources of concentrate to feed global custom smelting capacity. The majority of new production is expected to come from outside Asia. Increasing the level of Asian regional supply increases the security of supply for custom concentrate smelters. The Project, with its excellent product quality, will be a concentrate of choice and contribute towards the base-load for regional smelters. Major demand for the Project's copper concentrate is expected to come from China and India. Export to Indonesia represents an opportunity for the Project should new custom smelter capacity be established.
Economic	• *The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.* • *NPV ranges and sensitivity to variations in the significant assumptions and inputs.*	Costs and revenue estimates were prepared during the course of the Feasibility Study and reported in real 2018 US dollars. Cost estimates are reported in real 2018 US dollars as at Q1 calendar 2018. No cost escalation has been applied. The Ore Reserve estimate was validated using a discounted cash flow analysis model. The analysis incorporated the economic inputs derived from the Feasibility Study and the assumptions that support the Ore Reserve. The Project has a positive NPV at a discount rate of 8%. Sensitivity analysis was performed in the financial model on key inputs. The NPV is most sensitive to factors influencing copper revenue (price, grade, and recovery), discount rate, and development capital.
Social	• *The status of agreements with key stakeholders and matters leading to social licence to operate.*	PanAust undertakes structured engagement with all levels of government, landowners, communities and other stakeholders. No major agreements have been established with key stakeholders. There are no known social issues that threaten the license to operate.

Criteria	JORC Code explanation	Commentary
Other	• *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* • *Any identified material naturally occurring risks.* • *The status of material legal agreements and marketing arrangements.* • *The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the Ore Reserve is contingent.*	The HITEK Mineral Resource is located on Exploration License 58 in the Sandaun province of PNG. The exploration license is held by the Frieda River Joint Venturers and has been renewed on numerous occasions. The region experiences high rainfall and occasional elevated seismicity events. Geohazards are present in the immediate Project area. There are no other significant naturally occurring risks. There are no material legal or marketing arrangements. An application for a Special Mining Lease (SML) was submitted by the Frieda River Joint Venturers in June 2016 and will form the basis for obtaining the necessary mining tenements and associated development agreements. It is intended that the 2018 Feasibility Study will support an amendment to the 2016 SML application. A separate application for environmental permits will be made. There are reasonable grounds to expect that the necessary government approvals will be received.
Classification	• *The basis for the classification of the Ore Reserves into varying confidence categories.*	All critical assumptions applied to mining, ore processing, tailings and waste rock storage, cost and revenue are support by the estimates in the Feasibility Study and it is considered to be at a level of confidence appropriate for an Ore Reserve estimate. The confidence classification

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	• *Whether the result appropriately reflects the Competent Person's view of the deposit.* • *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).*	was therefore derived solely from the category of the Mineral Resource estimate: • The Proved Ore Reserve estimate is the economically mineable part of the Measured Mineral Resource estimate. • The Probable Ore Reserve estimate is the economically mineable part of the Indicated Mineral Resource estimate. These classifications appropriately reflect the Competent Person's understanding of the deposit.
Audits and reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	The mine planning model was reviewed by AVCS Consulting whose recommendations were incorporated into the model. The open-pit optimisation, open-pit design, LOM inputs and assumptions and operating cost estimation were independently reviewed and responses incorporated where appropriate. The 2018 HITEK Ore Reserve has been internally and externally peer reviewed with no significant concerns identified.

	Criteria	Risk rating	Commentary
Discussion of relative accuracy/confidence. Rated between 1 and 5 with 1 being the highest level of accuracy/confidence.	Mineral Resource	3	The absence of close spaced grade control drilling introduces an inherent level of uncertainty into the Mineral Resource estimate. The Mineral Resource model for the HITEK deposit was developed from a robust exploration data set. The Mineral Resource model and estimation process was independently reviewed by Xstract Mining Consultants (Ekwai and Koki)[1] and Quantitative Geoscience Consultants (HIT)[2] which provides confidence in the approach and methodology.

[1] *Koki Ekwai Mineral Resource Audit,* Xstract, 2016
[2] *HIT Mineral Resource review*, QG, 2015

	Criteria	Risk rating	Commentary
	Project status	3	The Project is a greenfield development in a remote location requiring significant new infrastructure and significant funding. It is possible that financing may not be made available to the Joint Venturers and the Project does not proceed. There are inherent levels of uncertainty for the Project's development until PNG government permits are issued and development conditions are agreed. Recent changes to the fiscal regime could harm to Project's economic returns. Future adverse legislative changes may make the Project unattractive to investors and the Project may not proceed to development.
	Cut-off parameters	3	Uncertainty relates to the underlying assumptions used to develop the revenue and cost models. The NSR cut-off is sensitive to metallurgical throughput and recovery models, the operating cost estimate and future metal prices, whose true values are unknown at this time. The selected open-pit shell equates to a conservative revenue factor 0.88 with metal price assumptions (US$2.90/lb copper and US$1,276/oz gold) that are below the value assumed for this Ore Reserve estimate (US$3.30/lb copper and US$1,450/oz gold). Cash flow modelling for the Project demonstrates that the Project is feasible. The Project also demonstrates a robust unit cash cost of copper production.
	Mining factors	3	Uncertainty relates to the underlying assumptions used to complete geotechnical, dilution and recovery assessment, water and waste management designs. The geotechnical slope stability recommendations were provided by an independent geotechnical consultant based extensive field work, 3D modelling and risk assessments. Ore loss is considered to be low due to the nature and size of the ore body.

	Criteria	Risk rating	Commentary
			Water management (both groundwater and surface water) is considered in the open-pit designs and is included in the cost estimates for the Feasibility Study. The waste management plan uses a conveyor and barge loading system to place waste rock into the ISF from Year 1. Mining productivity and operating time estimates are based on experience in similar conditions which provides confidence in these estimates.
	Metallurgy factors	2	The configuration of ore processing plant was developed by internal and independent experienced professionals and benchmarked from existing operations under similar conditions. The flowsheet selection and throughput and recovery models were developed from a suite of laboratory and pilot plant tests. Test work supports metallurgical recovery assumptions for material above the minimum copper grade criteria selected of 0.15% copper for primary ore and 0.2% copper for oxidised ore. Comminution and flotation test work and an independent peer review support the metallurgical recoveries for the oxide and primary ore types. The mine plans considers the impact of the two ore types. Ore hardness increases with open-pit depth and additional grinding capacity has been incorporated into the process plant design to offset the reduced throughput from harder ores. This configuration has been included in the production schedule and cost estimate.
	Environmental	3	Uncertainty arises from the Project's construction and operation in the high rainfall climate and steep terrain. Tailings disposal, waste rock management and water management practices are based on the high standards and successful experience at PanAust's existing operations. Mine waste rock and process tailings will be stored subaqueously in an ISF. The ISF design is supported by

	Criteria	Risk rating	Commentary
			extensive modelling which shows no significant adverse long term impact on downstream water quality. Experienced internal and independent personnel have developed the environmental designs and action plans for the Project. A comprehensive EIS has been prepared along with proposed environmental management plans to mitigate adverse environmental harm.
	Infrastructure	3	The uncertainty relates to the remoteness and lack of infrastructure supporting the Project's development. The Feasibility Study fully defines the infrastructure required to develop the Project: an ocean port, airport, public road, mine access road, concentrate pipeline, hydroelectric project, ISF and supporting infrastructure. The Feasibility Study developed designs, cost estimates and implementation plans that provides confidence in these infrastructure requirements.
	Cost Estimates	3	Uncertainty relates to the underlying assumptions and data used to develop the cost models. Cost estimates are considered reliable based on benchmarking data and independent review. Some uncertainty may exist with regards to the estimation of some quantities and future costs. These risks are considered to be consistent with industry practices and market-related price movements for goods and consumables.
	Revenue	3	Uncertainty relates to the future market supply and demand that influences the copper price. Long term prices for copper and gold have been provided by a reputable independent party based on their expert view of future supply and demand and the resultant price forecast.

	Criteria	Risk rating	Commentary
			Residual uncertainties for copper and gold prices exist. These risks are considered to be consistent with industry practices and market-related supply and demand movements.
	Market assessment	1	Uncertainty relates to the future sales agreements. The copper concentrate market is considered low risk. Existing long term contracts exist for the concentrate produced by PanAust's Phu Kham Copper-Gold Operation. Independent and renowned market specialists, CRU and Wood Mackenzie forecast deficits emerging in copper supply from 2022 and reverting to surpluses from 2025, assuming new supply is incentivised by higher prices to invest. Long term both groups forecast the market to be in equilibrium. Metallurgical test work indicates that Project concentrate will be low in deleterious elements and will be attractive to potential customers.
	Economic	3	Uncertainty relates to the influence of external market influences. The NPV of the Project is supported by the assumptions and analysis described in the Feasibility Study. The project will have life of mine operating costs in the first quartile of global production costs and will therefore sustain positive operating cash flows through low points in future metal price cycles.
	Social	3	Uncertainty relates to the social support for the Project and the conditions that may arise from the Mine Development Forum to be convened as part of the SML process. Negotiation of, and compliance with, acceptable compensation, resettlement and benefit sharing agreements will be critical to establishing and maintaining Project support. PanAust intends to maintain the support of host communities through transparent and effective stakeholder engagement, including

	Criteria	Risk rating	Commentary
			community development programs, capacity building initiatives, compensation, dispute resolution and grievance management.
	Classification	2	Uncertainty relates to the assumptions in the modifying factors used in the Ore Reserve estimate. The Ore Reserve classification reflects the Competent Person's confidence in the modifying factors and is based on the underlying Mineral Resource classification.