
**22 January, 2010**

# Frieda Copper Gold Project, PNG

## 26% increase in resource tonnages at Horse Ivaal Trukai deposit
## 40% of resource now in Measured and Indicated category
## Reaffirms Frieda as one of the world's top tier copper assets

**Highlands Pacific today reports a significant resource upgrade for its Frieda copper gold project in Papua New Guinea increasing the global resource base in the Frieda District to more than 8.1 million tonnes of contained copper and 13.3 million ounces of contained gold.**

Highlands partner, Xstrata Copper, has completed a new resource estimate with higher resource confidence for the Horse Ivaal Trukai deposit within the Frieda copper gold project. The scale and quality of the resource provides potential for a multi-decade mine. Full details of the Xstrata-prepared JORC-compliant estimate are attached.

Using a cut-off grade of 0.3% copper, the Horse Ivaal Trukai deposit is estimated to contain 1,060 Mt of copper mineralisation at a grade of 0.53% copper and 0.29 g/t gold. A further 300 Mt of inferred copper resources, which has previously been identified at the nearby Nena and Koki deposits lifts the total tonnage in the Frieda District towards 1,360 Mt. The Nena and Koki deposits did not form part of Xstrata's resource estimation work, however such deposits could in the future be incorporated into project development planning.

In summary the new mineral resource statement (focused on the Horse Ivaal Trukai deposit) estimates:

- A 26% increase in mineral resource, up from 840 Mt to 1,060 Mt at the same grade
- Measured and Indicated resources category now comprise 40% of the reported resource
- Contained copper of 5.6 Mt and gold of 9.9 million ounces within the open pit profile

***Managing Director of Highlands Pacific Mr John Gooding said today**: "The Frieda copper gold project is shaping up as one of the largest open-pit greenfield copper projects in the world. As last year's kilometre long deep intersection showed, Frieda has the district and depth potential for many decades of production. Xstrata has already invested over US$80 million over the past 3 years and we look forward to confirming the 2010 expenditure budget in the very near future. It is exciting that last year the Horse Ivaal Trukai deposit had a resource of 840 million tonnes and now the deposit has a resource of over a billion tonnes, constrained by a design pit, at the same grade. In addition 40% of the resource is now in the Measured and Indicated category."*

Frieda River is 170 kms NW of the giant Porgera gold mine in PNG. The partners are Highlands Pacific (16.95%), Xstrata (76.30%) and OMRD (6.75%). Highlands has a free-carried interest with Xstrata's interest dependent on the delivery of a feasibility study no later than January 2012.

A scoping study released in early 2009 indicated a 40Mtpa plant with a 27 year mine life averaging 200,000 tpa of copper metal and 240,000 ozpa of gold. The pre-feasibility study due in August 2010 is currently considering production options with a 50Mtpa plant. Subject to approval and funding, construction could commence in 2012 with production in 2017.


### Table 1: Horse-Ivaal-Trukai Mineral Resources at 0.3% Cu cut-off as at 23 December 2009

| Category | MT | Cu(%) | Au(g/t) | Ag(g/t) |
|---|---|---|---|---|
| Measured | 30 | 0.60 | 0.32 | 0.7 |
| Indicated | 390 | 0.57 | 0.33 | 0.8 |
| Inferred | 640 | 0.51 | 0.26 | 0.8 |
| **Total** | **1060** | **0.53** | **0.29** | **0.8** |

Notes:
Mineral Resources stated are based on "HIT 2009, pre-feasibility Resource Model". These figures are constrained by topography and an economic pit calculated with Measured, Indicated and Inferred resources. Numbers may not be exact as they are rounded for tabulation.
The information in the report that relates to Mineral Resources presented in Tables 1 is based on information compiled by Mr Raúl Roco, who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Roco is a full-time employee of an Xstrata Copper entity. Mr Roco has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the estimation of Mineral Resources to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Roco consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

### Table 2: Koki Mineral Resources at 0.2% Cu cut-off

| Category | MT | Cu(%) | Au(g/t) |
|---|---|---|---|
| Inferred | 274 | 0.44 | 0.3 |

Notes:
• The Koki deposit has been intersected by 30 drill holes on a nominal 150 m x 300 m grid.
• The resource information for Koki is based on information compiled by Lawrence Queen, who is a Member of The Australasian Institute of Mining and Metallurgy. Mr. Queen is a full-time employee of Highlands Pacific and has sufficient experience which is 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Queen consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

### Table 3: Nena Mineral Resources at 0.5% Cu cut-off

| Category | MT | Cu(%) | Au(g/t) | As(%) | Sb ppm |
|---|---|---|---|---|---|
| Indicated | 37 | 2.67 | 0.63 | 0.21 | 143 |
| Inferred | 14 | 1.80 | 0.42 | 0.13 | 86 |
| **Total** | **51** | **2.43** | **0.57** | **0.19** | **127** |

Notes:
1. Copper resource – lower cut off grade 0.5% copper,
2. Mineral Resources stated herein are based on the "Nena 2008 Conceptual Stage Resource Model"
3. These figures are constrained by topography; no economic pit has been applied to constrain the estimate. Numbers have been rounded for tabulation.
The information in the report that relates to Mineral Resources presented in Tables 3 is based on information compiled by Mr Raúl Roco, who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Roco is a full-time employee of an Xstrata Copper entity. Mr Roco has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the estimation of Mineral Resources to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Roco consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.


**ASX Code: HIG**
**PoMSox Code: HIG**
**Shares on Issue: 662 million**
**Options on Issue: 93 million**

**Directors**
Ken MacDonald, *Chairman*
John Gooding, *Managing Director*
Mike Carroll
Rod Mitchell
Drew Simonsen
Fiu Williame-Igara

***Management***
*Craig Lennon, CFO & Co.Sec*
*Larry Queen, Chief Geologist*
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## About Highlands Pacific Limited

Highlands Pacific is listed on the ASX and PoMSox exchanges. As at 18 January 2010 it had a market capitalisation of A$250 million and held approximately A$25m (US$22m) in cash. Its major development assets include the US$1.37bn Ramu nickel cobalt project, the Frieda River copper gold project, exploration on the highly prospective Nong River and Tifalmin licenses approximately 20km north of Ok Tedi.

### Frieda Copper/Gold Project

The Frieda copper project is one of the world's largest undeveloped copper/ gold resources. Frieda River is 170 kms NW of the giant Porgera gold mine. The project owners are Xstrata (76.30%), Highlands (16.95%) and OMRD (6.75%). Highlands has a free-carried interest through to completion of a Feasibility Study (required by Jan 2012). Xstrata's spend for Frieda in 2009 was US$38m. A scoping study released in early 2009 indicated a 40Mtpa plant with a 27 year mine life averaging 200,000 tpa of copper metal and 240,000 ozpa of gold. The pre-feasibility study due in August 2010 is currently considering larger throughput and production options. Subject to the project continuing to meet its project hurdles, a 12-month definitive feasibility study would commence in the third quarter of 2010. This would allow the project to potentially commence construction in 2012 and production in 2017.

### Ramu Nickel Cobalt Project

The Ramu nickel project is located 75 km west of the provincial capital of Madang, PNG and will produce an annual output of 31,500 tonnes of nickel and 3300 tonnes of cobalt contained in high grade concentrate over a 20 year mine life. The mineral resources at Ramu have the potential to increase the mine life by a further 15-20 years. Highlands 8.56% interest in the Ramu will increase to 11.3% at no cost after repayment of the project debt (estimated to be 10 years). From commissioning, Highlands has access to its pro-rata 8.56% share of Ramu's post-debt servicing net cash flow. Highlands also has an option to acquire an additional 9.25% at fair market value which could increase its interest to 20.55%.

**UNDER EMBARGO UNTIL 9AM AEDST, FRIDAY 22 JANUARY 2010**

**NEWS RELEASE**

# XSTRATA COPPER ANNOUNCES MINERAL RESOURCE UPDATE FOR THE FRIEDA RIVER COPPER-GOLD PROJECT IN PAPUA NEW GUINEA

Brisbane, 22 January 2010

Xstrata Copper announces a revised Mineral Resource estimate for the Horse-Ivaal-Trukai (HIT) deposit at the Frieda River copper-gold project in Papua New Guinea. The resource estimate includes significantly increased inventory and improved confidence levels, including a 26% increase in resource tonnage. Measured Resources have been reported for the first time and Measured and Indicated tonnes now total 40% of the increased resource inventory.

The new HIT resource estimate indicates a Measured, Indicated and Inferred Resource of over 1 billion tonnes at 0.53% copper, 0.29 g/t gold and 0.8g/t silver, using a cut-off grade of 0.3% copper.

Xstrata Copper Executive General Manager Project Evaluation, Peter Forrestal, said that the latest results confirmed Frieda River as potentially a very significant copper-gold producer in the Asia-Pacific region.

"Since assuming management control of the Frieda River Project in January 2007, Xstrata Copper has conducted an aggressive evaluation programme, completing 65,000 metres of drilling as part of scoping and pre-feasibility studies. The increased scale of and confidence in the resource indicated by this revised estimate for the Horse-Ivaal-Trukai deposit underlines the success of this approach.

"Our current focus is to conduct various technical studies to support a pre-feasibility study which is scheduled for completion in the third quarter of 2010. Stakeholder engagement and environmental studies are also under way.

"We are committed to moving forward with the Frieda River project in genuine partnership with our joint venture partners Highlands Pacific Limited and OMRD, the project's host communities and district, provincial and national governments," said Mr Forrestal.

***Table 1 Horse-Ivaal-Trukai Mineral Resources* as of 23 December 2009***

| Resource Class | Mt | Cu (%) | Au (g/t) | Ag (g/t) |
|---|---|---|---|---|
| Measured | 30 | 0.60 | 0.32 | 0.7 |
| Indicated | 390 | 0.57 | 0.33 | 0.8 |
| Inferred | 640 | 0.51 | 0.26 | 0.8 |
| **Total** | **1,060** | **0.53** | **0.29** | **0.8** |

* Horse-Ivaal-Trukai is a copper-gold porphyry deposit. The Mineral Resource estimate is reported above a 0.3% copper cut-off and is shown on 100% ownership basis as of 23 December 2009. The figures are constrained by topography and an economic pit calculated with Measured, Indicated and Inferred Resources. Numbers may not be exact as they are rounded for tabulation.

The information in this press release that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr. Raul Roco, who is a Member of The Australasian Institute of Mining and Metallurgy. Mr. Roco is a fulltime employee of the company. Mr. Roco has sufficient experience which is 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 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr. Roco consents to the inclusion in the press release of the matters based on his information in the form and context in which it appears.

*Ends*


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***Notes to editors***

**ABOUT XSTRATA PLC**
Xstrata is a global diversified mining group, listed on the London and Swiss Stock Exchanges, with its headquarters in Zug, Switzerland. Xstrata's businesses maintain a meaningful position in seven major international commodity markets: copper, coking coal, thermal coal, ferrochrome, nickel, vanadium and zinc, with a growing platinum group metals business, additional exposures to gold, cobalt, lead and silver, recycling facilities and a suite of global technology products, many of which are industry leaders. The Group's operations and projects span 19 countries.

**ABOUT XSTRATA COPPER**
Headquartered in Brisbane, Xstrata Copper is one of the commodity business units within the major global diversified mining group Xstrata plc. Its operations and projects span eight countries: Australia, Argentina, Chile, Peru, Canada, the USA, the Philippines and Papua New Guinea. Its operations are administered by five separate divisions, based close to the mining operations, namely the North Queensland, Minera Alumbrera, North Chile, Southern Peru and Canada divisions. It also has a recycling business (Xstrata Recycling) with plants in the United States and offices in Canada and Asia.

In Chile, Xstrata Copper's North Chile Division is headquartered out of the city of Antofagasta and manages the Lomas Bayas open pit copper mine and Altonorte Metallurgical Complex, both in

Antofagasta Region, and Xstrata Copper's 44% interest in the Collahuasi open pit copper mine in Tarapacá Region. Xstrata Copper is also developing the Energía Austral hydropower project in Aysén Region in southern Chile.

Xstrata Copper is the fourth largest global copper producer with annual attributable production capacity of nearly one million tonnes.

**FRIEDA RIVER PROJECT**

The Frieda River copper-gold project is located on the border of the Sandaun and East Sepik provinces in Papua New Guinea (PNG), about 200 kilometres from the coast and 70 kilometres from the navigable Sepik River. It is a joint venture between Xstrata Frieda River Limited (76.30%), Highlands Frieda Ltd (16.95%) and OMRD Frieda Co Ltd (6.75%). The project is managed by Xstrata Copper and is currently in the pre-feasibility study stage, due for completion in the third quarter of 2010.

22 January 2010

# Horse-Ivaal-Trukai Deposit Mineral Resource Statement
# Frieda River Copper-Gold Project

## Introduction

This document is an abridged version of the Competent Person's Report for the January, 2010 Horse-Ivaal-Trukai Mineral Resource Statement. It follows the JORC (2004) Code and guidelines for the reporting of Mineral Resource estimates.

This Mineral Resources report is based on information compiled by Raul R. Roco who is a full-time employee of Xstrata Copper and Member of the Australasian Institute of Mining and Metallurgy (AusIMM). Raul has been involved in all aspects of porphyry copper drilling, sampling analysis, database management, geological modelling, resource estimation, mining production and reconciliation. He has the necessary experience to be the Competent Person for the HIT resource estimate.

The Frieda River Project is a joint venture between the project manager, Xstrata Copper, and Highlands Frieda Limited and OMRD Frieda Co. Ltd; the equity split between the participants is 76.30%, 16.95% and 6.75% respectively. Xstrata Copper is conducting a pre-feasibility study on the project.

## Mineral Resource Statement

The Mineral Resource estimate of the Horse-Ivaal-Trukai (HIT) deposit is 1,060 Mt @ 0.53% copper, 0.29 g/t gold, and 0.8 g/t silver at a copper cut-off grade of 0.3 % copper on a 100% ownership basis; details are provided in Table 1 below.

**Table 1: Horse-Ivaal-Trukai Mineral Resources at 0.30% Cu cut-off as at 23 December 2009**

| Resource Class | Mt | Cu (%) | Au (g/t) | Ag (g/t) |
|---|---|---|---|---|
| Measured | 30 | 0.60 | 0.32 | 0.7 |
| Indicated | 390 | 0.57 | 0.33 | 0.8 |
| Inferred | 640 | 0.51 | 0.26 | 0.8 |
| **Total** | **1,060** | **0.53** | **0.29** | **0.8** |

**Note: Mineral Resources stated are based on "HIT 2009, pre-feasibility Resource Model". These figures are constrained by topography and an economic pit calculated with Measured, Indicated and Inferred Resources. Numbers may not be exact as they are rounded for tabulation.**

The Mineral Resources are based on the "HIT 2009, pre-feasibility study Mineral Resource Model". The increase in the Mineral Resource in relation to the 2008 Mineral Resource estimate is due to the incorporation of new drilling. This consists of infill drilling designed to improve confidence in the resource but also includes several holes drilled below the 2008 resource. The Mineral Resources presented in Tables 1, 2 and 3 are constrained by an economic Whittle pit shell resulting in the use of Measured, Indicated and Inferred Resource categories. Modifying factors are identical to those applied to the project pre-feasibility study.

A total of 208 diamond drill holes amounting 77,000m of core makes up the drill hole database used to model the mineralisation; from this only 64,000m have valid grade assay data. This is the data set that supports block grade interpolation. Compared to the previous 2008 estimate, 106 new drill holes (40,000m) have been added to the database.

Mineral Resources were classified using a combination of various criteria including interpolation parameters, perceived geological continuity and data density.

**Table 2: HIT Measured and Indicated Resource categories at several copper cut-offs as at the end of December 2009. These figures are constrained by topography and an economic pit calculated with Measured, Indicated and Inferred Resources.**

| Cutoff (Cu%) | Mt | Cu (%) | Au (g/t) | Mo (ppm) | Ag (g/t) |
|---|---|---|---|---|---|
| 0.2 | 496 | 0.52 | 0.31 | 33 | 0.8 |
| 0.3 | 425 | 0.57 | 0.33 | 34 | 0.8 |
| 0.4 | 348 | 0.62 | 0.35 | 34 | 0.8 |
| 0.5 | 253 | 0.68 | 0.38 | 35 | 0.9 |
| 0.6 | 159 | 0.76 | 0.41 | 36 | 0.9 |
| 0.7 | 87 | 0.85 | 0.45 | 37 | 1.0 |
| 1 | 11 | 1.16 | 0.5 | 32 | 1.0 |

**Table 3: HIT Measured, Indicated and Inferred Resource categories at several copper cut-offs as at the end of December 2009. These figures are constrained by topography and an economic pit calculated with Measured, Indicated and Inferred Resources.**

| Cutoff (Cu%) | Mt | Cu (%) | Au (g/t) | Mo (ppm) | Ag (g/t) |
|---|---|---|---|---|---|
| 0.2 | 1,418 | 0.46 | 0.25 | 31 | 0.7 |
| 0.3 | 1,063 | 0.53 | 0.29 | 33 | 0.8 |
| 0.4 | 797 | 0.59 | 0.32 | 34 | 0.8 |
| 0.5 | 535 | 0.66 | 0.35 | 35 | 0.9 |
| 0.6 | 307 | 0.75 | 0.38 | 36 | 0.9 |
| 0.7 | 156 | 0.84 | 0.41 | 35 | 1.0 |
| 1 | 19 | 1.16 | 0.44 | 33 | 1.1 |

## Location and Tenure

The Frieda River Project is located in the headwaters of the Frieda River in the foothills of the main divide in Sandaun Province, Papua New Guinea, 80km northeast of the Ok Tedi mine. The area is remote from roads and facilities and is serviced by air from Mt Hagen in the Highlands or Wewak on the northern coast.

The reported Mineral Resources are secured by Exploration License No. 58 covering an area of 150.6 $km^2$.

## Geology

The HIT deposit is located in the Frieda Igneous Complex (FIC), an accreted former island arc volcano of Miocene age which forms part of the "Maramuni Volcanics". The former Maramuni Arc now forms a string of volcanic complexes scattered throughout the length of New Guinea. Since accretion of the arc at around 10 Ma, major sinistral strain has occurred along the Bismarck-Torricelli Fault Zone, but a strain of probably some tens of kilometres has also occurred along major strike slip faults in the Highlands. The FIC is sandwiched between two such faults, the Frieda Fault and the Fiak-Leonard Schultze Fault.

The oldest rocks forming the basement to the FIC are the Cretaceous-aged OK Binai Phyllites which consist of calcareous to non-calcareous marine sediments and basic volcanics.

The FIC contains at least seven porphyry copper centres. The complex is more deeply eroded on the eastern end so that numerous intrusives occur near surface with the overlying volcanics having been stripped away. On the western end of the complex the volcanics and sediments are preserved virtually to their original surface.

The HIT deposit is hosted largely in the Horse Microdiorite (HMD), a hornblende - biotite – quartz diorite which intrudes the older diorites and volcanics of the FIC. Mineralisation is localised in the HMD, roof pendants of hornfelsed shale, and a hornblende-rich syn-mineralisation dyke of limited extent. There is minor dilution by barren post- mineral dykes in the eastern part of the HIT deposit.

Mineralisation conforms to well understood porphyry models, with an early potassic alteration, with chalcopyrite and bornite, spatially associated with "A" type vein stockworks. This is overprinted by quartz-chalcopyrite- pyrite "D" veins associated with a phyllic (quartz sericite) alteration and a final quartz-anhydrite event. In some areas, acid leaching has progressed far enough to give barren silica-clay-pyrite assemblages ("QIP").

## Data Density

The HIT deposit has been drilled on an approximate grid of 100 by 75 metres. Drill sections are mostly oriented 030°True North (TN) to 210°TN and spaced 75m apart. There are considerable local variations to this scheme caused by topography and constraints on drill pads in mountainous terrain.

**Table 4: Nomenclature of drill phases, with metres at HIT**

| | | | |
|---|---|---|---|
| Phase 1a | CEC 1969 – 1971 | DDH001 to DDH067 | 5,695 m |
| Phase 1b | FEPL 1976 – 1982 | DDH068 to DDH127 | 10,198 m |
| Phase 2 | Highlands Gold / HPL 1993-1997 | 001-IV95 to 004-TK97 | 9,901 m |
| Phase 3 | Cyprus 1998 – 1999 | C001 to C074 | 5,447 m |
| Phase 4 | Noranda – Falconbridge - XFRL 2002 – present | 001NOR02 to 191XC09 | 56,440 m |

A total of 265 holes comprising 87,681 m of diamond drilling contributed to the geological model of these 64,000m intersected mineralisation and had the necessary control information (i.e. surveys and QAQC) to be used in the resource estimate. The bulk of Phase 2 to Phase 4 holes were used for resource modelling purposes.

The majority of holes are oriented at a dip of 50 ° to 55° and azimuth 210°TN. Twelve holes from Phase 2 to 4 (1,944 m) are drilled on the historical Horse Grid, oriented 080°TN to 260°TN. A further twenty-nine Phase 2 to Phase 4 holes totalling 9,954 m, were drilled more than ten degrees off the Ivaal grid, providing some security against directional bias in the dataset.

**Drill Sample Recovery**

Recoveries are measured and recorded both in the engineering log on a run by run basis, and in the geological log on a per sample interval basis. Although there is much broken ground at Frieda, drill recoveries are considered to be adequate. There is a bias towards lower recoveries in the unmineralised leached cap. Mineralised intervals have a mean recovery of 86% and a median of 95% recovery. 75% of mineralised samples have recoveries better than 82%.

**Logging**

All drill hole core of Phase 2 and onwards has been carefully and systematically examined and logged. Significant effort in standardising geological description has been made during 2008-2009 including re-logging historical core and re-coding historical drill hole logs. The District Geologist, Geological Superintendent and one of the Senior Geologists have been with the project continuously since 2004, giving continuity to these efforts.

The logging codes used have adopted and refined the system instituted by Cyprus in 1998, providing historical continuity and internal consistency. Phase 2 logs have been recoded or relogged as necessary.

All core from Phase 2 onwards is preserved on site and digital core photography is available for most holes.

**Sampling Techniques**

The standard sample interval employed for most of the project drilling is 2 metres in length for the diamond core, regardless of the core diameter. The same sampling protocol has been in use for all the drilling used in the resource estimate:

1. Two metre intervals are sawn in half lengthways with a diamond saw
2. Half core is dried and the whole interval jaw-crushed to 90% passing -10 mesh.
3. A 3.5 kg sub-sample is taken and ground to finer than -40 mesh in a ring mill.

Since 2007, the circuit has been modified using a combination Boyd Crusher and rotating sample divider to produce an approximate 3kg split at -10 mesh in a single pass. This is pulverised in an LM5 mill as before, then a 250g split is taken from the bowl and dispatched to the primary laboratory. The LM5 product is tested to ensure greater than 90% of material passes -40 mesh, which it comfortably achieves. Reject splits are retained on site, where they are used for magnetic susceptibility measurement and then archived.

**Assay Procedures**

Prior to 2004, assays consist of a reduced set of elements (Cu, Pb, Zn, Mo and Ag) determined by atomic adsorption spectroscopy, plus gold determined by 50g fire assay, with copper and gold the only complete datasets. From 2004 onwards ( virtually all of the Phase 4 drilling) a multi-element ICP-OES method has been employed, giving a full set of trace

elements. Gold has continued by fire assay, as before. Copper results returning more than 0.5% copper are repeated using a more precise method of aqua regia digestion, HCl leach with complexing agents and AAS finish.

The principal laboratory for the Phase 4 assays has been ALS-Chemex in Townsville.

**Quality of Assay Data**

Very little QAQC information is currently available for checking Phase I assays for accuracy and precision. Apparently no quality control samples such as standards, duplicates or blanks were used during this program. This is one of the main reasons for this dataset to be rejected from the resource estimate.

Phase 2 drilling assays account for 14% of the resource estimate metres. While the primary laboratory published quarterly QAQC reports and some 10% of the samples were re-analyzed in a second laboratory with good correlation between the laboratories, the lack of use of standards and blanks prevents the assessment of assay accuracy and any possible contamination in 'carryover' samples.

No sampling bias was found when comparing intra lab duplicates (AST Astrolabe, Madang) for copper and gold assays. Comparing duplicates analyzed (by ALS Australian Lab Services, Brisbane), reveals a difference of some 3% for copper and 1% for gold, with Astrolabe returning the slightly lower values.

Phase 2 holes are considered acceptable for resource estimate at the current project stage. This conclusion was also reached by contemporary external auditors (Stephenson, 1998; Mineral Resources Development, 1997). No further check assays are now possible since the age of the archived core means that copper will have been lost by oxidation and weathering in the trays.

Phase 3 and Phase 4 sampling and assaying were completed based on a thorough QAQC control program including well characterised standards, blanks, preparation duplicates and check assays by an external laboratory. No critical issues were found during these programs and the results are considered accurate and reasonably precise.

**Quality of Data Description**

All geological logs, driller's reports, survey certificates and other relevant drill-hole data are physically collated in well maintained files for each individual drill hole in Brisbane or on site. The geological, survey, analytical and meta-data for the project are maintained in electronic files.

Internal checks of the analytical database consistency were made in 2007 by randomly selecting some 5% of drill holes and making spot checks of the correspondence between assay certificates and electronic data.

During 2009, an extensive review of the Phase 4 geological logging was undertaken, using the newly available trace element geochemistry dataset to identify inconsistencies in the logging. Each instance of inconsistency was investigated and resolved either by inspection of photographs or, if necessary, re-logging of the original core.

**Point location data**

All of the drill collars used in the resource estimate have been professionally surveyed using laser theodolite and EDM or Total Station in closed traverses, or else using differential GPS receivers. Accuracy of the collar positions is estimated to be better than one metre. Collars

are cross-referenced to the relevant survey documents, which are scanned into a digital archive.

Downhole survey is by Eastman camera prior to 2008, and subsequently using the Reflex survey tool. Films or the drillers' records are filed with the drill logs. A small number of observations have un-useable azimuth values due to magnetic wall rocks; in these cases the adjacent readings are averaged.

Topography at HIT has been mapped using Lidar technology. The resulting data points were gridded at 10m spacing to produce the topographic surface used in the modelling.

**Geological Interpretation and Modeling Techniques**

Two major structures have been interpreted on the basis of logged pug zones and, on a larger scale, alteration contrasts. These are the Horse-Ivaal fault and the Ivaal-Trukai fault. Along with the outer extent of the HMD, they form hard boundaries to the modelled units.

In the Horse area, to the southeast of the Horse-Ivaal fault, there is a lithological control on mineralisation. The HMD is well mineralised with the hornfelsed mudstones and the Hornblende Monzonite dyke (HBM) yielding higher grades also. The late Flimtem dykes are barren and grade falls off rapidly into the wall rocks. All of these lithological bodies have been modelled.

To the west of the Horse-Ivaal fault all mineralisation is hosted in HMD. The wall rocks have not been modelled in detail as there is no grade distinction between the pre-mineral diorites; only intrusive versus volcanics is modelled. The principal control in the Ivaal-Trukai area is alteration. This has been modelled as a sequence of potassic, phyllic and QIP alteration.

The third constructed model is a weathering model. This is a series of stacked surfaces which define a barren leached zone, a supergene zone where copper mineralisation is dominated by chalcocite, and a primary zone where copper is mostly present as chalcopyrite.

Different methods were used for the three models, working mostly in Vulcan software:

- Weathering surfaces were constructed as polylines, section by section, and a gridding algorithm was used to construct a gridded surface and finally, a triangulation.
- For steeply-dipping lithological units, an initial triangulation was made using polygons on multiple level plans, and subsequently refined in section view.
- Alteration solids were interpreted directly in 3-D using Leapfrog software, and subsequently fine-tuned to honour all the available data.

All the modelled polygons were then reviewed to ensure that they honoured all available down hole and surface mapping data, and were adjusted if necessary. The lithological, alteration and weathering solids were then used to attribute the block model and provide the necessary inputs for the exploratory data analysis and determination of estimation domains.

**Resource Estimation approach**

The Mineral Resource was estimated using established geostatistical techniques following comprehensive statistical and exploratory data analysis (EDA). The evaluation of appropriate geological groupings for combination into statistical estimation populations was undertaken through the iterative statistical definition of Estimation Domains (ED) for each element. These were interpolated using spatial declustered statistics calculated on both the routine two metre sample set and the final drill hole composite set. 4m length, downhole composites truncated at estimation domains have been calculated separately for each estimated element. A minimum of 1m in length was required for a composite to participate in the interpolation process.

Declustered statistics were generated from nearest neighbour models obtained for each estimated element and also checked against the cell declustering approach. Experimental correlogram models were generated with SAGE 2001 software and interpolation correlograms were evaluated and modeled using three rotation axes.

The estimated elements are total copper, gold, silver and molybdenum. Block grade interpolation was carried out using three-pass ordinary block kriging of 25m by 25m by 15m blocks. Each pass reflected the various ranges established by the correlogram models for each element and estimation domain using the Ordinary Kriging (OK) algorithm for most of the domains. A few domains for which reliable correlograms were impossible to obtain, were interpolated using the Inverse Distance algorithm to the power of two. The kriged block dimension is identical to that to be employed in future mine planning and is currently envisaged as the selective-mining unit (SMU) for the projected operation.

No direct grade capping was done; the extended influence of the high grade outlier composites was restricted in the kriging plans where necessary. The impact of this restriction was assessed by interpolating auxiliary block models without restrictions to the outliers and also by close visual inspection of the results. The nearest neighbour reference models were also obtained with and without the restriction to outliers and served as reference for checking the presence of bias at the global scale.

The block grade dilution related to the geology boundaries was taken up in the final block grades by considering the proportion of each geological population within each block. This approach accounts for grade dilution related to geological contacts and provides similar results to what is normally referred to as "partial block" grade interpolation. The proportion of each lithological, mineral and alteration domain is stored on a block by block basis from the interpreted solids. For the interpolation of total copper grades, each domain had its own interpolated variable that was used to derive the final block grade by weighting the interpolated grades based on the proportions of each domain within the block. This approach was used for total copper, gold and molybdenum. The final block grade for Total Copper at HIT is calculated using the following equation:

$$\mathbf{TCu\ (\%) = \sum_{i=0,N} L(i) * Cu(i) / \sum L_{(i)}}$$

where L(i) is the proportion of each domain within a particular block, Cu (i) is the estimated copper grade for each domain and TCu (%) is the final volume-weighted estimated copper grade. T.

**Tonnage Factors**

Bulk density factors were evaluated employing wax-coating measurements. Bulk density measurements were done on 10cm unsplit HQ and PQ core. Bulk density determinations show good coverage of lithology, mineral zonation and alteration units relative to the total number of meters drilled within each unit. The data comprises more than 5,000 data points and shows good spatial coverage throughout the project area.

Some preferential sampling exists as a competent piece of core is needed for the density measurement and therefore friable materials are not represented in the density dataset. This situation is particularly relevant in the upper part of the deposit, above the Gypsum-Anhydrite discontinuity surface and defines an upper zone of approximately 300 m in thickness from surface. This could lead to some positive bias on the bulk density determination. To mitigate this, a separate set of measurements was introduced during the 2009 drilling campaign.

Density determinations were made from drying and weighing the whole core tray and calculating the volume through measuring the length of core stored on that tray. This is, as

yet a small dataset with less than 300 measurements. However, when comparing these two datasets, a positive bias of approximately 10% in favour of the wax-coated core method has been detected for the zone above the Gypsum-Anhydrite surface. This situation was addressed by using the wax-coated core dataset after removing density values above the Gypsum-Anhydrite surface.

Tonnage factors for resource estimation were derived by interpolating bulk density from the drill core data for each mineral zone domain using the ID^2 algorithm and then applying a correction factor that subtracts 0.2 $t/m^3$ for all the mineral zones above the Gypsum-Anhydrite surface except for the Supergene zone for which a 0.1 $t/m^3$ was subtracted. No modifications to the interpolated bulk density values were applied below the Gypsum-Anhydrite surface.

**Resource classification**

Measured, Indicated and Inferred Resources were classified based on the perceived geology and grade spatial continuity as modelled from the variographic analysis. The blocks were classified as a function of the available data in their respective neighbourhoods. Separate resource classification parameters were established for primary mineralization in the Ivaal sector. Copper grade variability was determined to be more continuous for the primary-Ivaal mineralisation when compared to all other zones in the deposit.

For the primary-Ivaal mineralisation resources are classified as Measured when interpolated by a 75m by 50m by 75m search with a minimum of 3 drill holes. Indicated Resources result from a 100m by 80m by 100m search with a minimum of 3 drill holes. Inferred Resources result from a 150m by 100m by 100m search with a minimum of one drill hole. Interpolation searches are all oriented N60°W according with the main direction of continuity.

For all other mineralisation in Horse, Trukai and non-primary mineralisation in Ivaal, the classification parameters used for Measured Resources are derived using a 50m by 50m by 50m search and a minimum of 3 drill holes within the search. Indicated Resources are defined by a 80m by 80m by 80m search with a minimum of 3 drill holes. Inferred Resources are those interpolated with a search of 150m 100m by 100m search using a minimum of one drill hole. Interpolation searches are all oriented N60°W according with the main direction of continuity.

**Metallurgical Factors**

Process route for the HIT mineralization is currently defined as a milling and standard flotation operation based on comminution and flotation test work results. Further variability test work is in progress.

No penalty elements have been recovered in flotation test work to date.

**Cut-off Grades**

Current economic cut-off grades for copper are as follows:

1. "Sulphide": sulphide feed to the concentrator equal or greater than 0.3% total copper based on preliminary mining and milling costs and metallurgical recovery.
2. "Waste": all materials not included in the above category.

**Audits of the HIT Resource estimation**

This resource estimate will be subject to an independent review as part of the pre-feasibility study risk assessment.