MARENGO MINING LIMITED

ABN: 57 099 496 474

YANDERA MINING COMPANY LIMITED (COMPANY NO. 1-53202)

MARENGO MINING (PNG) LIMITED (COMPANY NO. 1-76844)

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NEWS RELEASE

YANDERA RESOURCE UPDATE
SUBSTANTIAL INCREASE IN MEASURED RESOURCE & GRADE
METALLURGICAL TESTWORK RESULTS IMPROVE
LAND-BASED TAILINGS OPTION SELECTED

Marengo Mining is pleased to provide the following resource update for the Yandera Copper-Molybdenum-Gold Project, PNG:

At a 0.25% Copper cut-off Grade:			Contained Copper (M lbs)
Measured & Indicated	**362Mt**	**0.43% Cu**	**3,422**
Inferred	**218Mt**	**0.37% Cu**	**1,778**

At a 0.20% Copper cut-off Grade:			Contained Copper (M lbs)
Measured & Indicated	**486Mt**	**0.37% Cu**	**3,964**
Inferred	**347Mt**	**0.31% Cu**	**2,371**

- **Significant conversion of tonnes to the Measured category, increasing confidence in the possible minimum 20 year mine life plan**
- **Identified higher grade zones near surface (grading +0.5% Cu) for initial potential years of production**
- **Confirmed large areas of elevated gold and molybdenum grades**

At a 0.10 g/t Gold cut-off:			(M Troy Oz)
Measured & Indicated	**199Mt**	**0.17 g/t**	**1.1**

At a 40 ppm Molybdenum cut-off:			(M lb)
Measured & Indicated	**532Mt**	**0.01%**	**140**

- **Improved recoveries for Cu, Au and Mo. High grade concentrate from the recent metallurgical testwork programme**
- **Encouraging results from first hole of the Dirigi exploration programme**

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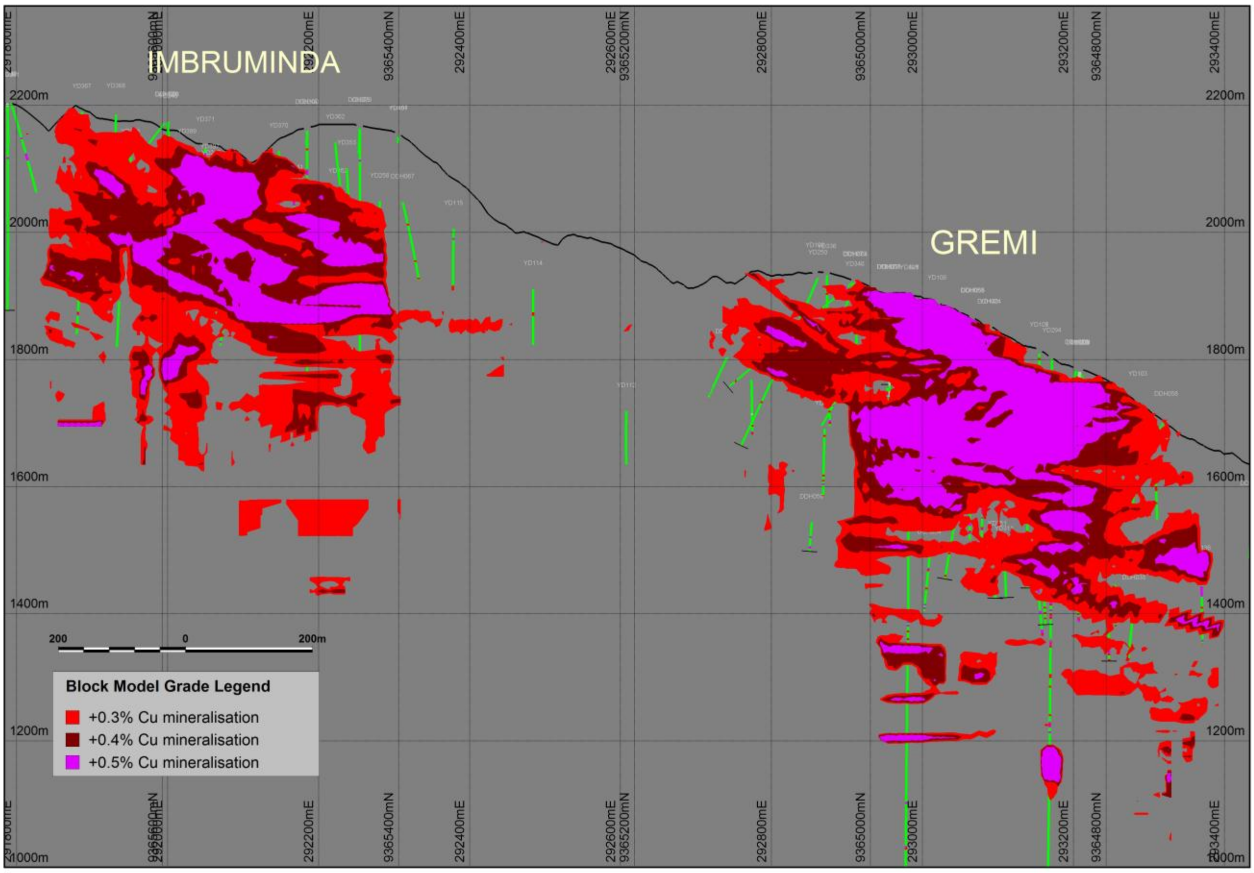
International copper development company Marengo Mining Limited (TSX: **MRN,** ASX and POMSoX: **MGO)** ("Marengo" or "the Company") has taken a further key step towards its objective of developing a, long-life mining operation at the 100%-owned Yandera Copper-Molybdenum-Gold Project in Papua New Guinea, after today announcing an update to its mineral resource position.

The updated resource estimate was prepared in accordance with the JORC Code by minerals industry consultancy group, Ravensgate. The updated resource estimate corresponds with Canadian Institute of Mining, Metallurgy and Petroleum classifications. A full copy of Ravensgate's current resource statement is attached to this release.

Of particular note is the substantial conversion of copper resources to the Measured category with improved grade and the conversion of additional Indicated resources from the Inferred category.

Figure 1: Yandera Resource Block Model



Marengo's Managing Director & CEO, Mr. Les Emery, said "The resource update supports the previously stated goal of achieving a minimum operating life of at least twenty years. The measured resource category has increased by over 100% and substantial additional resources have been upgraded from the inferred to indicated category".

"Drilling activity continues at Yandera, both on further in-fill tasks within the Yandera Central deposit and on nearby exploration targets", he added.

"Furthermore, areas of higher grade (+0.5% Cu) have been identified that, with the advantage of topography, can potentially be targeted for the initial years of possible production."

The resource estimate incorporates assay results from 465 diamond drill holes totalling 145,335 metres, which were drilled up until the end of 2011.

The Yandera Copper-Molybdenum-Gold Project reviewed as a part of this 2012 updated resource modeling study has so far demonstrated and confirmed that this area contains significant amounts of copper mineralisation. The tonnages reported, for example above a nominal 0.25% Cu lower cut-off, and the coincident contained metal tonnages are significant.

The following table shows the comparison between the current resource estimate and the previous estimate (April 2011);

Table 1: Yandera – Comparison to previous Resource Estimate

Total Measured & Indicated	Cut-off	Mt	Cu (%)
April 2012 Model	0.25% Cu[1]	361	0.43
April 2011 Model	0.30% CuEq[2]	359	0.36
Inferred			
April 2012 Model	0.25% Cu[1]	218	0.37
April 2011 Model	0.30% CuEq[2]	417	0.38

1) *Ravensgate does not use copper equivalent grade for reporting*

2) *The copper equivalent calculation used by Golder Associates in April 2011 was CuEq = (Cu% + (Mo% x 10))*

In addition, an extensive section of the Yandera deposit shows zones of higher grade gold and molybdenum (refer tables below), which may make a positive potential contribution to the overall project. Additional metal inventories for by-product silver and rhenium have not been calculated at this time.

Table 2: Yandera April 2012 Resource – Copper

Cut-off (Cu %)	Resource Category	Mt	Cu (%)
0.20	Measured	314	0.38
0.25	**Measured**	**248**	**0.43**
0.30	Measured	192	0.48
0.20	Indicated	172	0.35
0.25	**Indicated**	**114**	**0.42**
0.30	Indicated	81	0.48
			Cu % Weighted average
0.20	Measured & Indicated	486	0.37
0.25	**Measured & Indicated**	**362**	**0.43**
0.30	Measured & Indicated	273	0.48
			Cu (%)
0.20	Inferred	347	0.31
0.25	**Inferred**	**218**	**0.37**
0.30	Inferred	144	0.42

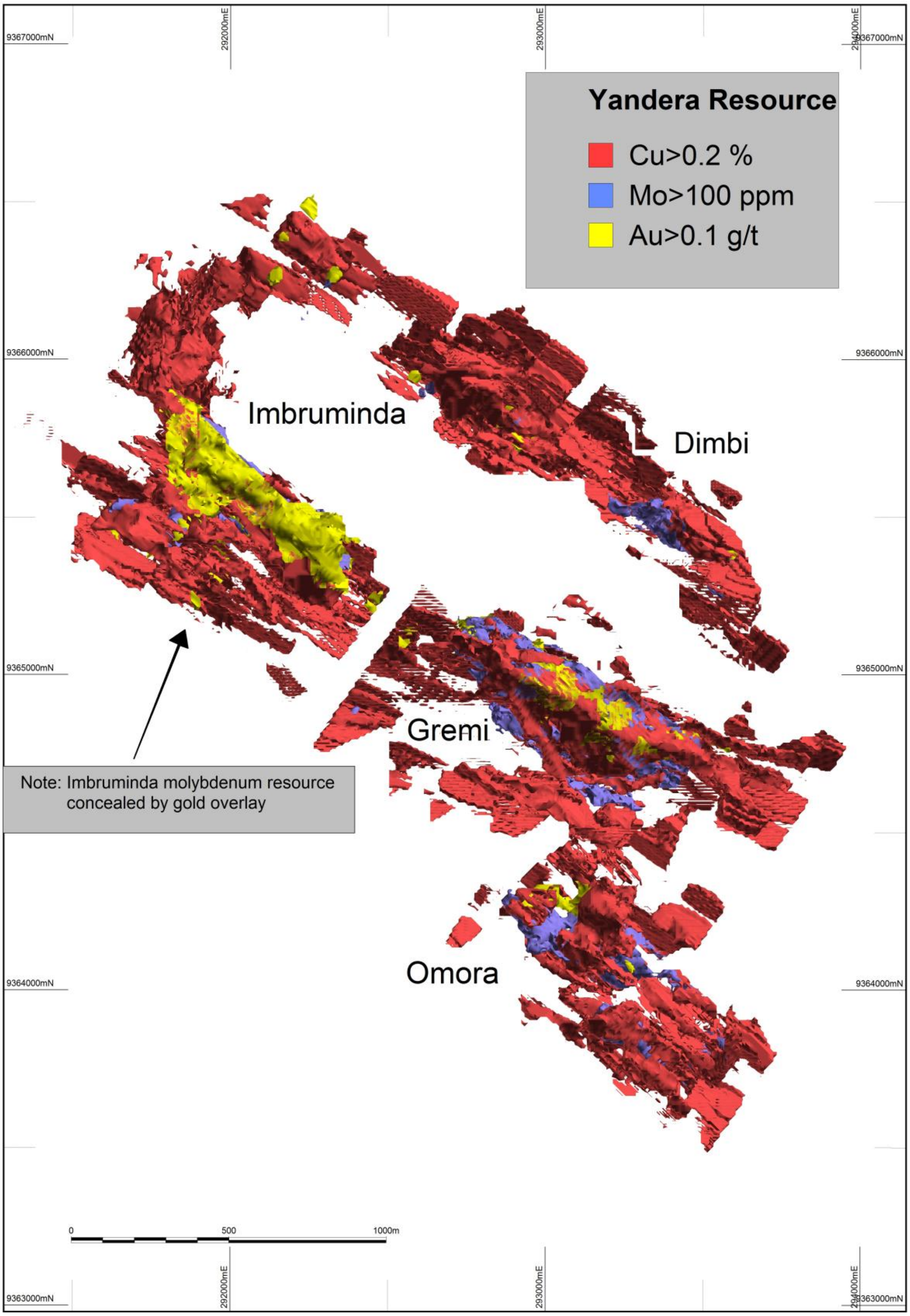
Table 3: Yandera April 2012 Resource – Molybdenum

Cut-off (Mo ppm)	Resource Category	Mt	Mo (ppm)
40	Measured	354	129
60	Measured	279	150
40	Indicated	178	100
60	Indicated	120	125
			Mo weighted average (ppm)
40	**Measured & Indicated**	**532**	**119**
60	Measured & Indicated	399	142

Table 4: Yandera April 2012 Resource – Gold

Cut-off (Au g/t)	Resource Category	Mt	Au (g/t)
0.10	Measured	155	0.17
0.10	Indicated	44	0.18
0.10	**Measured & Indicated**	**199**	**0.17**

Figure 2: Yandera Central Porphyry



METALLURGY

Recent metallurgical testwork on mineralised drill core samples from the Yandera deposit has recently been undertaken as follows:

NFC/Nerrin	Comprehensive mineralogical assessment, flotation and magnetic separation testwork undertaken at the Beijing General Research Institute of Metallurgy and Mining (BGRIMM) laboratory under the direction of China Nonferrous Metal Industry's Foreign Engineering and Construction Co. Ltd. (NFC) and others.
AMS/Marengo	Parallel testing with the NFC program undertaken at ALS-Ammtec in Perth, WA and supervised by Arccon Mining Services (AMS) and Marengo. This program is continuing.

The NFC/Nerrin and AMS/Marengo programs were undertaken on samples of drill core specially produced for metallurgical characterisation. Approximately 22 tonnes of full core, representing a variety of feed types, was obtained.

About 80% of the core was sent to Beijing for testing under the guidance of NFC, whereas the balance of the core was delivered to the ALS-Ammtec laboratories in Perth for predominantly parallel testing under the direction of AMS (Perth branch is individually certified to standards within International Organization for Standardization ISO 9001:2000).

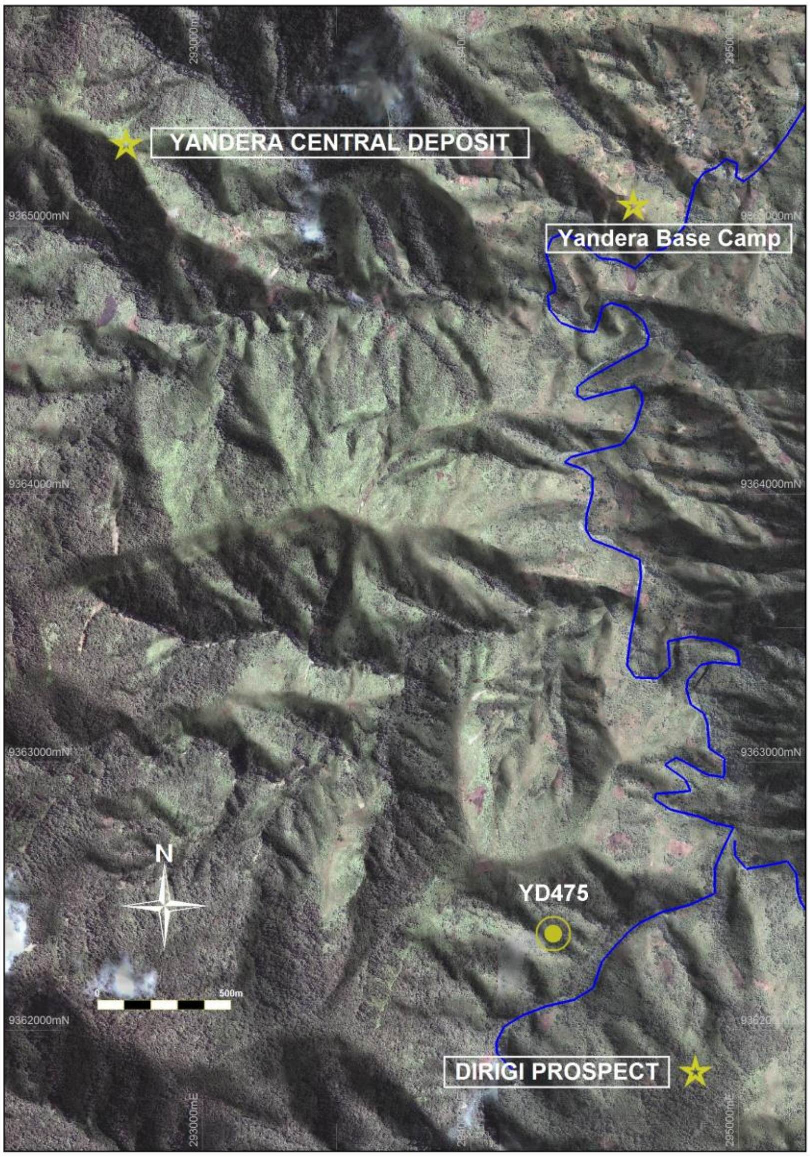
Relative insensitivity to grind size and an optimum P80 grind size of 150 µm was selected on the basis of the recovery values and assessment of operating costs associated with comminution.

Copper recoveries of over 91% and preliminary Mo recoveries around 80% were achieved.

Concentrate copper concentrate grades of greater than 30% Cu, plus gold and silver, and preliminary molybdenum concentrate grades of 50% were obtained. The concentrate samples have shown no level of deleterious elements that would cause smelter penalties.

Photo of metallurgical testwork conducted by Ammtec, Perth.

Figure 3: Aerial view of Yandera and Dirigi



Exploration

Results have been received for the first hole of the 15 hole exploration program over the Dirigi prospect. In YD475, mineralisation was encountered near surface as detailed below, and is associated with a zone of tectonic brecciation and quartz veining. Averages are presented in the table below:

YD475 (Collar 294311E 9362358N Azimuth (AMG) 215@ -60; E.O.H 401.5 m)

From (m)	To (m)	Width (m)	Cu %	Mo ppm	Au g/t	Ag g/t
3	57	54	0.23	211	0.12	12.76

Work has been completed on the airborne geophysical survey covering the areas of ELs1633 and 1670 which have become the recent focus of Marengo's greenfields exploration interests.

The data generated from this detailed airborne survey, which includes magnetics and radiometrics, will be used in conjunction with fieldwork either already carried out or for the future for target generation. Interpretation is scheduled to commence in the next month following delivery of the finalised dataset.

With improvement in the weather, regional work has commenced with the first of a number of planned sorties for mapping and sampling. This initial fieldwork has embarked on preliminary investigations in the Queen Bee area approximately 15 km NW of Yandera. Historical work reports skarnoid mineralisation around Queen Bee and the team are expected to make progress in identifying and delineating any mineralised bodies. In addition, planning has commenced for a ridge and spur soil sampling program over certain prospective parts of EL1633 (Yomi) identified in the 2011 stream sediment and mapping work.

Photo of Helicopter with stinger attached for radiometric survey

TAILINGS STORAGE NEAR PROJECT

Following a review of the tailings options for the completion of the Feasibility Study, and discussions with various stakeholders, it has been decided to go forward on the basis of a combined rock waste dump and tailings storage facility. The facility will be located in close proximity to the Yandera project and processing areas, with the copper concentrate being transferred to a coastal shipping facility by a small diameter pipeline, which will where possible, follow existing infrastructure corridors to a coastal loading facility.

A National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* compliant technical report in connection with the updated resource filed concurrently on SEDAR (www.sedar.com) or attached to this release.

Les Emery

Managing Director / CEO
30 May 2012

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NOTES

Certain statements in this report are forward-looking. These statements address possible future events and conditions and, as such, involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the statements. Such factors include, among others, the results of future exploration, risks inherent in resource estimates, increases in various capital costs, availability of financing and the acquisition of additional licences, permits and surface rights. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date the statements were made, and readers are advised to consider such forward looking statements in light of the risks set forth in the company's continuous disclosure filings as found at the (Canadian) SEDAR website.

"JORC Code" refers to the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2004 Edition).

The section of this report relating to the Yandera Mineral Resource Estimate was prepared from information by Mr Stephen Hyland of Ravensgate Minerals Industry Consultants and Mr Karl Smith of Karl Smith Mine and Geology Consulting. Mr Hyland And Mr Smith are Fellows of the Australasian Institute of Mining and Metallurgy and both have sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity undertaken 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 (The JORC Code, 2004 Edition). Mr Hyland and Mr Smith consent to the inclusion in this announcement of the matters based on this information, in the form and context it appears.

The updated mineral resource estimate and the resource estimate for the by-product metals and all other scientific and technical information contained in this news release (including Appendix B) were prepared by or under the supervision of Mr Stephen Hyland, Principal Consultant Geologist, Ravensgate Minerals Industry Consultants and Mr Karl Smith of Karl Smith Mine and Geology Consulting. Mr Hyland and Mr Smith are "Qualified Persons" as defined by National Instrument 43-101 "Standards of Disclosure for Mineral Projects" ("NI 43-101"). Mr Hyland and Mr Smith are independent of Marengo Mining Limited (Marengo), as such terms are defined in NI 43-101. Mr. Hyland and Mr Smith have read and approved the contents of this news release (including the Appendices hereto). Mr Hyland and Mr Smith verified the data disclosed and the underlying information contained in this news release. The effective date of the updated mineral resource estimate and the resource estimate for the by-product metals is April 12, 2012. The method used to verify the data was similar to that described in Marengo's technical report filed on SEDAR and dated November 9, 2007. The key assumptions, parameters and methods used to estimate the mineral resources are as set out in Appendix A hereto. The estimate of mineral resources are not materially affected by any known environmental, permitting, legal, title, taxation, socio-political, marketing or other relevant issues.

The contents of this release have been approved by Mr. Paul J Kreppold, BEng(Hons) MEngst LLB FIE(Aust) CPEng , a "Qualified Person" as set out in National Instrument 43-101 (NI43-101) by reason of education, affiliation with a professional association (as defined in NI43-101) and past relevant work experience. For further information on Mr. Kreppold please refer to the National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* compliant technical report, **SECTION 29. CERTIFICATES OF QUALIFIED PERSONS,** in connection with the updated resource filed concurrently on SEDAR (www.sedar.com) or attached to this release.

For further information on the Yandera Project, including a description of Marengo's standard data verification processes, quality assurance and quality control measures, and details of the key assumptions, parameters and methods used to estimate the mineral resources set out in this report and the extent to which the estimate of previously declared mineral resources set out herein may be materially affected by any known environmental, permitting, legal, title, taxation, socio-political, marketing or relevant issues, readers are directed to the technical report entitled "Technical Report on the Yandera Copper-Molybdenum-Gold Project Madang Province, Papua New Guinea", dated May 14, 2012, lodged concurrently on SEDAR (www.sedar.com) or attached to this release.

The resources disclosed herein are preliminary in nature and include inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them to be categorized as mineral reserves. There is no certainty that the mineral resources disclosed herein will be realized or converted to mineral reserves. Mineral Resources which are not mineral reserves do not have demonstrated economic viability.

Ravensgate

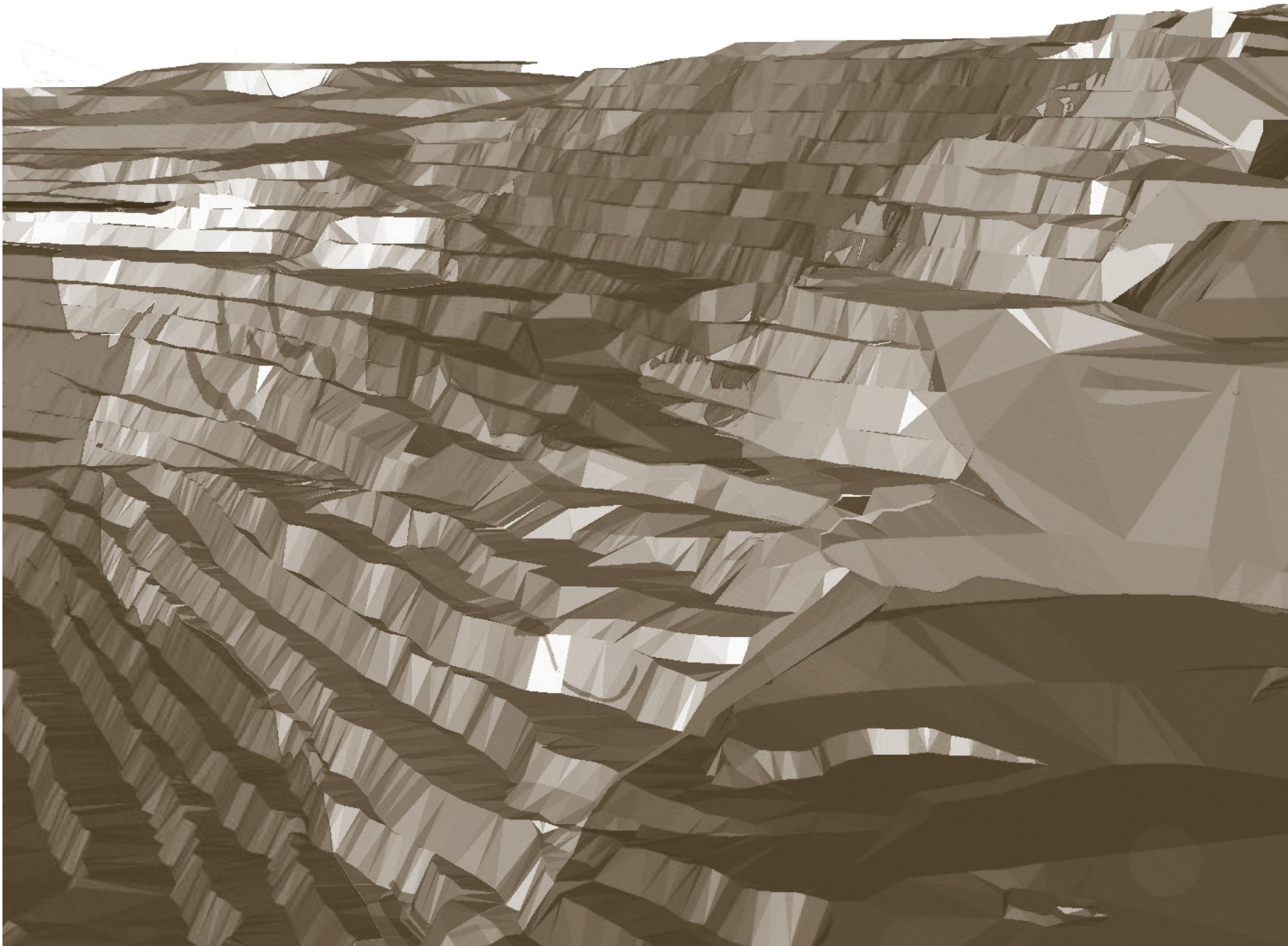
TECHNICAL REPORT

on the

Yandera Copper-Molybdenum-Gold Project
Madang Province,
Papua New Guinea

for

MARENGO MINING LIMITED



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TECHNICAL REPORT

on the

Yandera Copper-Molybdenum-Gold Project
Madang Province,
Papua New Guinea

for

MARENGO MINING LIMITED

14 May 2012

Technical Report on the Yandera Copper-Molybdenum-Gold Project, Madang Province, Papua New Guinea

Prepared by RAVENSGATE for:

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Date: 14 May 2012

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1. SUMMARY

1.1 Introduction and Terms of Reference

This Technical Report on the Yandera Copper-Molybdenum-Gold Project resource in Madang Province, Papua New Guinea (PNG) has been prepared by Ravensgate on behalf of Marengo Mining Limited (Marengo). It has been prepared in accordance with the requirements of National Instrument 43-101 (NI 43-101), "Standards of Disclosure for Mineral Projects", for the Canadian Securities Administrators (CSA) for lodgement on CSA's "System for Electronic Document Analysis and Retrieval" (SEDAR).

This report is an update to the mineral resources stated in a previously published Technical Report "Technical Report, Yandera Copper Molybdenum Project, Madang Province, Papua New Guinea" published in April 2011. In accordance with the requirements of NI 43-101 it also includes updates of information on the intended configuration of the project and on metallurgical testwork prepared on behalf of Marengo by Arccon Mining Services. Due to substantial changes in the intended configuration of the project it supersedes the Technical Report titled "Revised Technical Report – Effective November 2007" which was issued in March 2008.

1.2 Property Description and Ownership

The resource is located in the Madang province of Papua New Guinea (PNG) at an elevation of about 1,800m in the Bismarck Mountain range approximately 70km inland from the north coast. Present road access is by an unmaintained four wheel drive track. The reliability of access by this means is very low and exploration activities are almost entirely supported by helicopter.

Madang, with a population of about 35,000, is the capital of Madang province. Madang has facilities such as a harbour, airport, hospital, schools, and university and with road access to the ports of Lae to the east, Wewak to the west and connection to the Highlands Highway though Goroka and Mt Hagen. The resource is about 95km directly southwest of Madang city and 25km from the road network connecting Madang and Lae.

Marengo currently is the holder of five exploration licenses, three exploration licenses for which renewals have been lodged and three exploration license applications. The total area of these 11 licenses is in excess of 1,700 square kilometres. Of the three applications for renewal, two (Koinambe and Togoban) have been refused by the PNG Minister for Mining without giving reasons. In proceedings brought by Marengo the PNG National Court has ordered that the decision be stayed pending the decision being reviewed (refer Note 1 to Table 8).

An exploration license entitles the holder to exclusively explore for minerals for a period of two years as well as the right to apply for a mining lease (ML) or a special mining lease (SML). An ML permits the holder to exclusively mine the lease for a period of up to 20 years with the right to apply for a renewal up to 10 years. An SML is for large scale mining operations.

The Yandera Porphyry Cu-Mo-Au resource is located on EL1335 with an area of 246.5 square kilometres. This tenement was first granted on 20 November 2003. The expiry date was the 19 November 2011. Application for renewal was made in a timely manner and, as is standard practice, the grant is taken to be continuing as the application is processed. However, although the Company has no reason to believe that EL1335 will not be renewed for an additional two year term, there can be no assurance that will be the case.

The closest granted licenses are listed below:

- EL193 held by Ramu Nickel is located 20km north northeast of Yandera and is the lateritic nickel deposit supporting the Ramu Nickel Mine.

- EL1304 held by Daehan Resources Development Ltd. It is located approximately 50 km northwest of Yandera.
- EL1596 held by Frontier Gold (PNG) Ltd. It is located approximately 70km west of Yandera.
- El 1755 held by Australian PNG Minerals (APM). It is located approximately 75km northwest of Yandera. APM is targeting gold, copper, nickel and platinum.

1.3 Geology and Mineralisation

Yandera lies in the New Guinea Copper fold belt, a province comprised predominantly of deformed Mesozoic and Tertiary rocks. Lithologies within the belt include clastic sediments, mafic to intermediate volcanic and minor limestones. These lie within an elongate northwest striking belt dominated by northwest striking structural fabric related to collision of the Indo-Australian plate with island arc complexes in Miocene to Pliocene times.

Locally, the Yandera porphyry Cu-Mo-Au deposit lies within the core of the Miocene Bismarck Intrusive complex. The deposit has undergone a complex history of mineralisation and deformation. Earliest porphyry phases were intruded when the complex was relatively deeply buried (>3km) with subsequent porphyry mineralisation and alteration phases reflecting progressively shallower depositional levels related to an overall extensional tectonic regime. Breccias are locally observed as being important controls on mineralisation.

Alteration is extensive and has occurred in multiple over-printing phases with multiple mineralisation sources. Five main mineralisation styles are identified at Yandera including oxide, transition (oxide plus sulphide material), supergene (re-deposition of leached copper to the oxide/sulphide interface), enriched (deposition of covellite or chalcocite from acidic magmatic fluids) and hypogene. Of note is that the major economic elements (Cu, Mo and Au) are partitioned and distributed differently due to the complex nature and distribution of alteration and mineralisation

1.4 Status of Exploration, Development and Operations

The Yandera project has been drilled by several companies over the history of the project. Initial exploration was undertaken by Kennecott Exploration from 1966 to 1972 when 12 diamond holes (DDH001-DDH012) for 2,275m were completed. From 1973 to 1980 a BHP/Amdex Australia JV completed an additional 90 diamond holes (DDH13 – DDH102) for 30,942m. No further drilling was done on the project until 2007 when Marengo began drilling. Since then Marengo has completed, as of 10 February 2012, an additional 362 diamond holes for 112,117m (YD103-YD465).

An Airborne magnetic and radiometric survey was flown late 2009 and another is currently in progress. From the survey the significance of structure acting as a conduit for fluid flow and magmatism has been emphasised. This has led to the identification of a number of exploration targets.

During the first half of 2011 Marengo undertook a ridge and spur soil sampling programme over the Dirgi Mountain area approximately 4km southeast of the Yandera Deposit. The results of this programme were used for drill targeting and exploration drilling is currently underway in this area with an initial seven hole programme.

During the second half of 2011 a stream sediment programme in the Yomi (EL1633) and Togoban (EL1670) areas was designed and implemented. The Yomi sampling was mostly completed by the end of 2011 and will recommence during the dry season of 2012. Follow up work is currently being designed.

1.5 Processing

For the purposes of metallurgical characterisation, mineralised materials from the Yandera deposit may be generally classified into three main types, ie: oxide, mixed (transitional) and hypogene. The hypogene material type represents the majority of available material (+80%) and contains primary copper sulphide mineralisation such as chalcopyrite and bornite. Oxide material contain oxide and secondary sulphide copper minerals and mixed material contains both oxidised and sulphide minerals. Hypogene material does not contain oxide minerals. The distinction of these three material types relates to the mineral types within the rock as compared to the weathering nature of the host material.

Sufficient metallurgical testwork has been conducted on samples from these material types over three separate programmes to develop preliminary process flowsheets and, in most cases, major equipment selections for the various corresponding unit processes. However, further testing is either yet to be formally reported or be completed. This may alter the overall approach and, almost certainly, will be used to further refine the processing equipment details.

In general, the preliminary process flowsheet consists of:

- Primary gyratory crushing and transfer to a 16 hour live capacity coarse material stockpile.
- Primary crushed feed reclaim to twin, parallel, single stage SAG (semi-autogenous grinding) milling and hydrocyclone classification circuits for grinding to a product size of 80% passing 150 microns (P80 of 150 µm).
- Rougher/scavenger flotation, bulk concentrate regrind and copper (Cu) cleaner flotation for the production of a cleaned copper, molybdenum (Mo) and gold (Au) concentrate.
- Cu/Mo concentrate regrind and separation of a Mo concentrate via a Mo roughing and multi-stage cleaning flotation circuit, with that circuit tail stream representing a final Cu concentrate.
- Rougher magnetic separation of the bulk flotation tails followed by regrind, cleaner magnetic separation and reverse flotation of a magnetite concentrate.
- Separate transfer of Cu and magnetite concentrates via a slurry pipeline to a filtration and bulk concentrate storage facility at Madang.
- Ship-loading facility for the transfer of the bulk, filtered Cu and magnetite concentrates.
- Thickening, filtration, bagging and containerisation of the Mo concentrate at the Yandera site for road transport to Lae.
- Tailings thickening and disposal to an integrated tailings disposal and mine waste storage facility.
- Reagent preparation and distribution facilities.
- Services including water supply and reticulation, air supply and reticulation and grinding media storage and loading equipment.

Plant performance (under simulated conditions to the flowsheet described above) is, at this stage, envisaged to include:

- Rougher-scavenger flotation Cu and Mo recoveries of approximately 95% and approaching 90%, respectively, for the hypogene material types.
- Final Cu recoveries of between 84% and 93% for the hypogene feeds (pending ongoing testwork results) to a cleaned Cu concentrate at saleable grades.
- Reasonable gold and silver recoveries to a Cu concentrate of around 75% and 60%, respectively.

- Production of a saleable Mo concentrate at a grade of over 47% Mo with corresponding recoveries of approximately 80% for the hypogene feeds.
- Potential Rhenium credits for the Mo concentrate.
- Poorer metal recoveries for the oxide feed types with improvement potential probably limited.
- Potential for the relatively simple production of a saleable magnetite concentrate grading above 65% Fe.

Additional metallurgical testwork is either underway or planned for the near future with the aims of further optimisation of flotation and magnetic separation parameters to further improve final metal recoveries via flowsheet modifications or conditions refinement, verify operating consumables usage projections and to provide engineering related data for major equipment selection.

1.6 Mineral Resource and Mineral Reserve Estimates

The Yandera deposit Mineral Resources reported herein are for copper, molybdenum and gold. The effective date of these reported resources is 12 April 2012 and the drill hole data cut-off date was the 10 February 2012.

The Yandera area geological interpretation and subsequent modelling was carried out by Mr. Gabriel Liam of Marengo in conjunction with Mr. Sam Ulrich of Ravensgate. Mr. Karl Smith of Karl Smith Mine and Geology Consulting established the strategy for developing kriging domains. The mineralisation and geological interpretation work used all available surface mapping, data from drill hole logging as well as some mapping and samples from two adits.

The resource estimation carried out for this study utilised MineSight^{tm} software. One large block model was constructed for the deposit which covered and extended where necessary beyond the current extent of drilling. In addition to the underlying geological and material type coding in the model a set of grade interpolation items for Cu, Mo and Au were incorporated. The method of grade interpolation used for all elements was the Ordinary Kriging technique which used calculation parameters based upon localised geostatistical and associated variography studies.

Table 1 and Table 2 summarise the tonnes and copper grade reported from the block modelling at a range of copper lower cut-off grades.

Table 1 Resource Summary – Yandera Cu-Mo-Au Block Model **Measured and Indicated Resources as at April 12th, 2012 at Varying Lower Cut-Off Grades** **(OK Block Model) Reporting Item CUPC1 - ZONEA=1→7 Zones Only**															
Copper Cut-off Grade	**Measured Resources**					**Indicated Resources**					**Total Measured and Indicated Resources**				
% Cu	**Volume (Mm^3)**	**Tonnes (Mt)**	**Cu (%)**	**Mo (ppm)**	**Au (ppm)**	**Volume (Mm^3)**	**Tonnes (Mt)**	**Cu (%)**	**Mo (ppm)**	**Au (ppm)**	**Volume (Mm^3)**	**Tonnes (Mt)**	**Cu (%)**	**Mo (ppm)**	**Au (ppm)**
0.20%	124	314	0.38	104.6	0.085	67	172	0.35	52.7	0.048	191	486	0.37	86.2	0.07
0.30%	76	192	0.48	122.8	0.099	31	81	0.48	63.2	0.059	107	273	0.48	105.2	0.09
0.40%	44	111	0.57	140.3	0.111	16	42	0.61	72.3	0.069	60	153	0.58	121.7	0.10
0.50%	24	62	0.68	152.7	0.122	9	23	0.74	79.4	0.077	33	85	0.70	132.6	0.11
0.70%	8	20	0.90	170.7	0.136	3	9	1.01	65.1	0.086	11	29	0.93	137.7	0.12
0.80%	5	12	1.01	173.9	0.142	3	7	1.10	61.5	0.094	8	19	1.05	133.8	0.12
1.00%	2	4	1.24	162.2	0.145	1	3	1.37	69.3	0.080	3	7	1.30	124.7	0.12

Note: M is an abbreviation for million

Table 2 Resource Summary – Yandera Cu-Mo-Au Block Model **Inferred Resources as at April 12th, 2012 at Varying Lower Cut-Off Grades (OK Block Model) Reporting Item CUPC1 – ZONEA=1→7 Zones Only**					
Lower Cut-off CUPC1	**Inferred Resources**				
	Volume (Mm^3)	**Tonnes (Mt)**	**Cu (%)**	**Mo (ppm)**	**Au (ppm)**
0.20% Cu	135	347	0.31	37.8	0.03
0.30% Cu	56	144	0.42	41.9	0.04
0.40% Cu	23	59	0.54	49.7	0.05
0.50% Cu	11	28	0.65	58.3	0.06
0.70% Cu	3	8	0.88	25.7	0.05
0.80% Cu	2	5	0.94	17.7	0.06
1.00% Cu	0.5	1	1.22	29.1	0.05

Note: M is an abbreviation for million

Table 3 and Table 4 summarise the tonnes and molybdenum grade reported from the block modelling at a range of molybdenum lower cut-off grades.

Table 3 Resource Summary - Yandera Cu-Mo-Au Block Model **Measured and Indicated Resources as at 12 April 2012 at varying Mo (ppm) Lower Cut-off Levels - ZONEB=1→9 Mo Zones only - (MOKR1 Block Model Reporting Item)**									
Mo(ppm) Cut-Off Grade	**Measured Resources**			**Indicated Resources**			**Total Measured and Indicated Resources**		
%	**Volume Mm^3**	**Tonnes (Mt)**	**Mo (ppm)**	**Volume Mm^3**	**Tonnes (Mt)**	**Mo (ppm)**	**Volume (Mm^3)**	**Tonnes (Mt)**	**Mo (ppm)**
20	194	494	100.3	116	298	71.0	310	792	89.3
40	138	354	128.7	69	178	99.8	207	532	119.0
60	109	279	150.0	47	120	124.7	156	399	142.4
80	85	218	172.4	33	84	149.0	118	302	165.9
100	64	164	199.9	23	59	174.1	87	223	193.1
150	30	77	289.1	10	25	248.6	40	102	279.2
200	18	47	364.7	5	13	320.9	23	60	355.2

Note: M is an abbreviation for million

Table 4 Resource Summary – Yandera Cu-Mo-Au Block Model **Inferred Resources as at 12 April 2012 at varying Mo (ppm) Lower cut-off Levels – ZONEB=1→9 (Mo) Zones Only - (MOKR1 Block Model Reporting Item)**			
Lower Cut-off MOKR1	**Inferred Resources**		
	Volume (Mm^3)	**Tonnes (Mt)**	**Mo (ppm)**
20	286	737	58.1
40	167	431	86.0
60	100	259	117.6
80	67	173	146.9
100	47	121	176.3
150	40	104	189.4
200	20	51	262.8

Note: M is an abbreviation for million

Table 5 and Table 6 summarise the tonnes and gold grade reported from the block modelling at a range of gold lower cut-off grades.

Table 5 Resource Summary – Yandera Cu-Mo-Au Block Model **Measured and Indicated Resources as at 12 April 2012 at varying Au (ppm) Lower cut-off Levels - ZONEC=1→10 (Au) Zones Only - (AUKR1 Block Model Reporting Item)**									
Gold Cut-off Grade	**Measured Resources**			**Indicated Resources**			**Total Measured and Indicated Resources**		
Au(ppm) Cut-Off	**Volume Mm^3**	**Tonnes (Mt)**	**Au (ppm)**	**Volume Mm^3**	**Tonnes (Mt)**	**Au (ppm)**	**Volume (Mm^3)**	**Tonnes (Mt)**	**Au (ppm)**
0.20	13	33	0.28	4	10	0.34	17	43	0.29
0.30	4	9	0.41	2	4	0.48	6	13	0.43
0.40	1	3	0.54	0.9	2	0.61	1.9	5	0.57
0.50	0.6	2	0.67	0.6	1	0.70	1.2	3	0.68
0.70	0.2	0.5	0.88	0.2	0.4	0.98	0.4	0.9	0.92
0.80	0.1	0.3	0.99	0.1	0.3	1.11	0.2	0.6	1.05
1.00	0.04	0.1	1.17	0.07	0.2	1.29	0.11	0.3	1.25

Note: M is an abbreviation for million

Table 6 Resource Summary – Yandera Cu-Mo-Au Block Model Inferred Resources as at 12 April 2012 at varying at varying Au (ppm) Lower cut-off Levels – ZONEC=1→10 (Au) Zones Only - (AUKR1 Block Model Reporting Item)			
Lower Cut-off AUKR1	**Inferred Resources**		
	Volume Mm^3	**Tonnes (Mt)**	**Au (ppm)**
0.20	4	10	0.67
0.30	2	6	0.91
0.40	2	5	1.01
0.50	2	4	1.05
0.70	1	3	1.18
0.80	1	3	1.20
1.00	0.01	0.03	1.71

Note: M is an abbreviation for million

This mineral resource statement has also been compiled in accordance with the guidelines defined in the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2004 Edition).

Stephen Hyland is a fellow of the Australasian Institute of Mining and Metallurgy. Stephen has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity undertaken to qualify as a Competent Person as defined in The JORC Code, 2004 Edition.

1.7 Interpretation, Conclusions and Recommendations

The Yandera Copper-Molybdenum-Gold Project reviewed as a part of this 2012 updated resource modelling study has demonstrated and confirmed that this area contains significant amounts of Copper mineralisation. The tonnages reported, for example above a nominal 0.50% Cu lower cut-off, and the coincident contained metal tonnages, are significant.

It is recommended that further programs of resource drilling be carried out, directed towards preliminary grade control planning for initial extraction of some of the higher grade copper resources, particularly near surface. Additional resource definition, within the Inferred portions of the deposit, is required to assist decisions related to determining more accurately the defining mineralisation and mining boundaries. It is Ravensgate's opinion that the localised copper distribution variances tend to be fairly high and this may not be immediately evident in sparsely drilled areas. A close spaced grade control drilling pattern across selected areas of the Yandera deposit area will be most beneficial in confirming the localised copper variance characteristics of the deposit and helping to calibrating specific parts of the Yandera Resource Block Model to date.

Whilst there has been ongoing focus on the overall observed copper mineralisation, it has also become clear that the extent of the lithologically controlled ancillary elements molybdenum and gold will benefit from additional study. Some re-definition of the lithology and structural controls in conjunction with associated alteration geochemistry may be useful.

Future modelling studies should be carried out periodically, as part of best industry practice as it relates to continuous improvement. This additional modelling would be enhanced by refined rock mass and structural modelling as updated structural mapping becomes available in conjunction with a copper mineralisation distribution review that will follow additional drilling. These up-dates should ideally be incorporated before commencement of detailed mine planning prior to project construction.

Comparison with similar deposits indicates that the Yandera Project has the characteristics to enable it to become a viable large scale mining operation delivering marketable quality copper and molybdenum concentrates and magnetite. The very recent completion of the resource model has not provided the opportunity for a detailed examination of the economics which, consequently, are not further discussed herein.

The deposit has attracted the attention of a large Chinese construction group which is interested in promoting the project in the Chinese banking community and, after appropriate further study, providing an offer for development which contains a large fixed price element of costs.

The PNG community, from national to local level, has expressed positive views about the desirability of development.

It is recommended that the studies on the project be carried forward to Feasibility Study level and that the documents and supporting activities, such as the Environmental Impact Statement and others required to initiate the full project permitting process, also be progressed to completion. Advancing the study to that point would require the expenditure of approximately US$5M. Should that study show that application for permits is the logical next step then that should be done and the supplementary work required to obtain a proposal for a Development Contract with the majority of the construction activities undertaken for a fixed price should also be undertaken. It is estimated that a further US$5M would be required to advance the technical and commercial aspects of the project to that stage.

2. INTRODUCTION

2.1 Introduction and Terms of Reference

Ravensgate was requested by Marengo to complete an Independent JORC (2004) and National Instrument 43-101 compliant Mineral Resource Estimate at its Yandera Copper-Molybdenum-Gold Project, Madang Province, Papua New Guinea. This resource estimate supersedes the previous JORC (2004) resource estimate completed in April 2011. Marengo has completed new drilling at the property in 2011 and 2012 and this new estimate is based upon the new geological and assay information obtained from this programme.

This technical report has been compiled in accordance with the JORC Code and the National Instrument 43-101, Companion Policy 43-101CP and Form 43-101F1. The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code-December 2004) is prepared by the Joint Ore Reserves Committee (JORC) which is comprised of representative members from the Australasian Institute of Mining and Metallurgy (AusIMM), the Australian Institute of Geoscientists (AIG), the Minerals Council of Australia (MCA), the Australian Securities Exchange (ASX), and the Securities Institute of Australia (SIA).

It is mandatory for all companies actively working on exploration, mining and mineral processing projects within the minerals sector listed on the ASX (Australian Securities Exchange) to report all exploration results, mineral resources and ore reserves using the JORC Code as a reporting guideline. The JORC Code provides minimum standards for public reporting, so as to ensure that investors and their advisors have the necessary information they reasonably require to form reliable opinions on the results and estimates being reported. Reporting according to the JORC guidelines does not automatically satisfy the requirements of National Instrument 43-101 reporting, but is a very sound basis for doing so.

This report has been compiled based on information available up to and including the date of this report.

2.2 Report Qualified Persons

A listing of the Qualified Persons, together with the sections of this Technical Report for which they are responsible, is given in Table 7.

Table 7 List of Qualified Persons

Qualified Person	Position	Employer	Independent of Marengo	Date of Site Visit	Professional Designation	Section of report
Stephen Hyland	Principal Consultant	Ravensgate	Yes	No visit	BSc Geology, FAusIMM, CIMM, GAA, MAICD	Sections 1, 6-12, 14, 23, 25, 27-29
Karl Smith	Principal Consultant	Karl Smith Mine and Geology Consulting	Yes	14 – 16 April 2012	BSc Geology, MSc Geology, FAusIMM	Sections 1-4, 6-12, 14, 23, 25, 27-29
Paul Kreppold	General Manager	Arccon Mining Services	Yes	12 – 14 April 2012	BEng(Hons), MEngst, LLB, FIE(Aust), CPEng	Sections 1-5, 13, 15-29

2.3 Sources of Information

Data has been provided by Marengo.

Two of the principal authors of this Technical Report visited the project site in April 2012 and have been provided access to various sources of information used to compile this report. The additional authors have had access to other specific reporting information with respect to property description, exploration, geology, mineralisation and project development planning which are comprised of technical reports and associated data compiled by Marengo and their partners or consultants, which is publically available information usually as ASX and TSX releases and various government reports. The authors have also undertaken detailed discussions with Marengo's technical and corporate management personnel and understand that all technical data available for the project has been provided for review.

With the consent of Marengo, the other general report contents describing the regional geology, historical exploration and current exploration has been reproduced verbatim from a number of Marengo internal and publically available reports. A listing of the principal sources of information is included in the references attached to this report. All reasonable enquiries have been made to confirm the authenticity and completeness of the technical data upon which this report is based. A final draft of this report was also provided to Marengo along with a request to identify any material errors or omissions prior to final submission. The majority of technical data includes but is not limited to:

- Digital data files containing all historical and more recent drilling and sampling;
- Drilling, drill-core and quality assurance and quality control ("QA/QC") protocols;
- All technical reports that are relevant to the geological and mineralisation interpretation used for resource estimation at the Yandera Project, including metallurgical reports;
- Various mineralisation interpretation geometry files and material type interface surfaces and topographic terrain change information as well as some underground adit survey data files;

- Various information regarding assumptions used in project development to date as well as some information regarding proposed future project development and general project data, including anticipated future development costs.

2.4 Site Visits

Messrs Karl Smith and Paul Kreppold visited the site during April 2012, each for a period of several days, during which time they inspected the mine and general locality and access. In the case of Mr Smith one adit (Bravo), several drill hole sites, and the core storage facilities along with core handling procedures were also inspected. In the case of Mr Kreppold the intended waste dump and tailings disposal area was also inspected.

2.4.1 Karl Smith Observations and Comments

Mr Smith's visit on the 14th through 16th April 2012 included the core sheds at the main Yandera camp site. Core handling and logging procedures were described by the site geologists. The core storage facility at Frog Camp was also visited. The drill cores at both locations are well labeled and neatly stored.

The Frog Camp also houses the new core sample preparation facility which is operated by Intertek (ITS PNG Limited). The facility is well laid out and the manager described their sample preparation process, which Mr Smith observed in action. The sample preparation process crushes core down to two millimetres, splits the sample to produce a nominal 1.5 kg sample that is then sent to Lae for where the sample is pulverised before being sent to Jakarta for assay. The Frog camp drying ovens operate between 105 and 110 degrees Celsius. This new facility received the first core on 2 April 2012. Prior to this core samples were sent to the Intertek sample preparation facility located in Lae. The samples were assayed in Jakarta, Indonesia.

Portions of the project site known as Imbruminda, Gremi, and Omora were traversed by foot and many drill collars and old drill pads were observed. The Dimbi area was seen from the helicopter.

At Omora an operating drill rig was observed as shown in Figure 1. When Mr Smith arrived the drill string was being changed over from HQ to NQ as is consistent with the procedure to reduce core size after 200 metres are drilled. The hole geology logging sheet and oriented core was observed as shown in Figure 2.

The drill pads observed at Omora were recent and thus the rock exposure was good because moss and lichen plant growth had not yet covered the rocks as at older drill sites. The observed rocks at drill pads are all within the near surface oxide, or transitional, zone and thus features of the rock are not as distinct as those within Adit Bravo.

Adit Bravo, located on Gremi, extends into fresh rock where virtually all mineralisation has a near vertical orientation as can be seen in Figure 3. This near vertical trend is consistent with the variorgraphy described in Section 12.4 Domain Variography.

Other rock exposures are located in and along streams and creeks, but none of these were closely examined due to elevated water levels and flows during the wet season.

Figure 1   Omora Drill Hole YD486 on 16/04/2012

Figure 2   Oriented Core from Omora Drill Hole YD486

Figure 3 Picture of Fresh Rock in Bravo Adit

2.4.2 Paul Kreppold Observations and Comments

Mr Kreppold's visit was on the 12th through 14th April 2012.

The main Yandera camp site was visited which included existing accommodation, geology offices and core sheds. During the visit to the core sheds the core handling and logging procedures were described by the site geologists.

The Frog Camp core sample preparation facility run by Intertek was also visited and viewed. The facility manager described the sample preparation procedure and process.

The area of the proposed process plant site was traversed by foot and the proposed stockpile and crusher location observed from the air by helicopter. The proposed conveyor route joining the crusher to the mil was also inspected.

Portions of the project site known as Imbruminda, Gremi, and Omora were observed from the air by helicopter as was the proposed road access, concentrate pipe line and power route. The existing road in was also traversed by air.

The location of the waste rock dump, tailings starter dam and the two valleys forming the tailings storage facility was viewed as was the local Yandera village.

An existing wharf and ship loader site and associated facilities at Madang were inspected by air and traversed by foot.

3. RELIANCE ON OTHER EXPERTS

While information provided by Marengo relating to its holding of title to the property and on other legal, land tenure, corporate structure, permitting and environmental matters has been reviewed, no opinion is offered in these areas. The Qualified Persons are not experts in land, legal, permitting, environmental and related matters and therefore have relied (and believe there is a reasonable basis for this reliance) in this report on Marengo, who contributed the information regarding legal, land tenure, corporate structure, permitting, environmental issues and specifics of the property description and location.

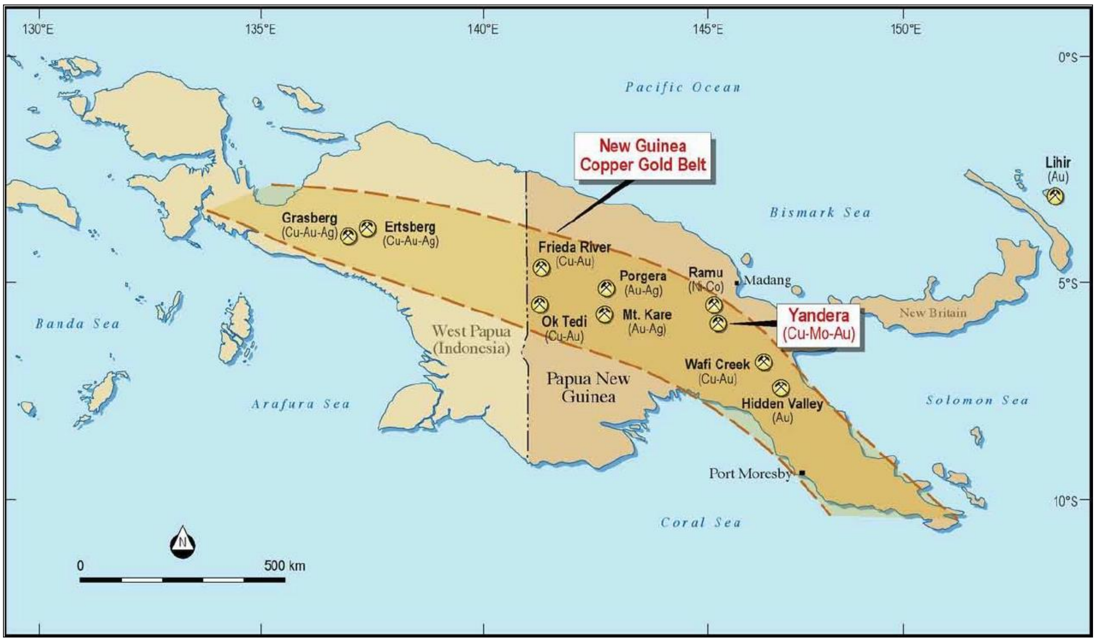
4. PROJECT DESCRIPTION AND LOCATION

4.1 Project Location

The Project is located in the Madang Province which is on the northern part of mainland Papua New Guinea and is approximately a one hour flight north from Port Moresby (Figure 4). The project is located at the latitude 5.75oS and longitude 145.12oE.

The proposed Yandera mine site is located in the Bismarck Ranges at an elevation of about 1,900m and about 95km west southwest from the reasonably well equipped port city of Madang on the north coast.

Figure 4 Locality Map of the Yandera Deposit Papua New Guinea



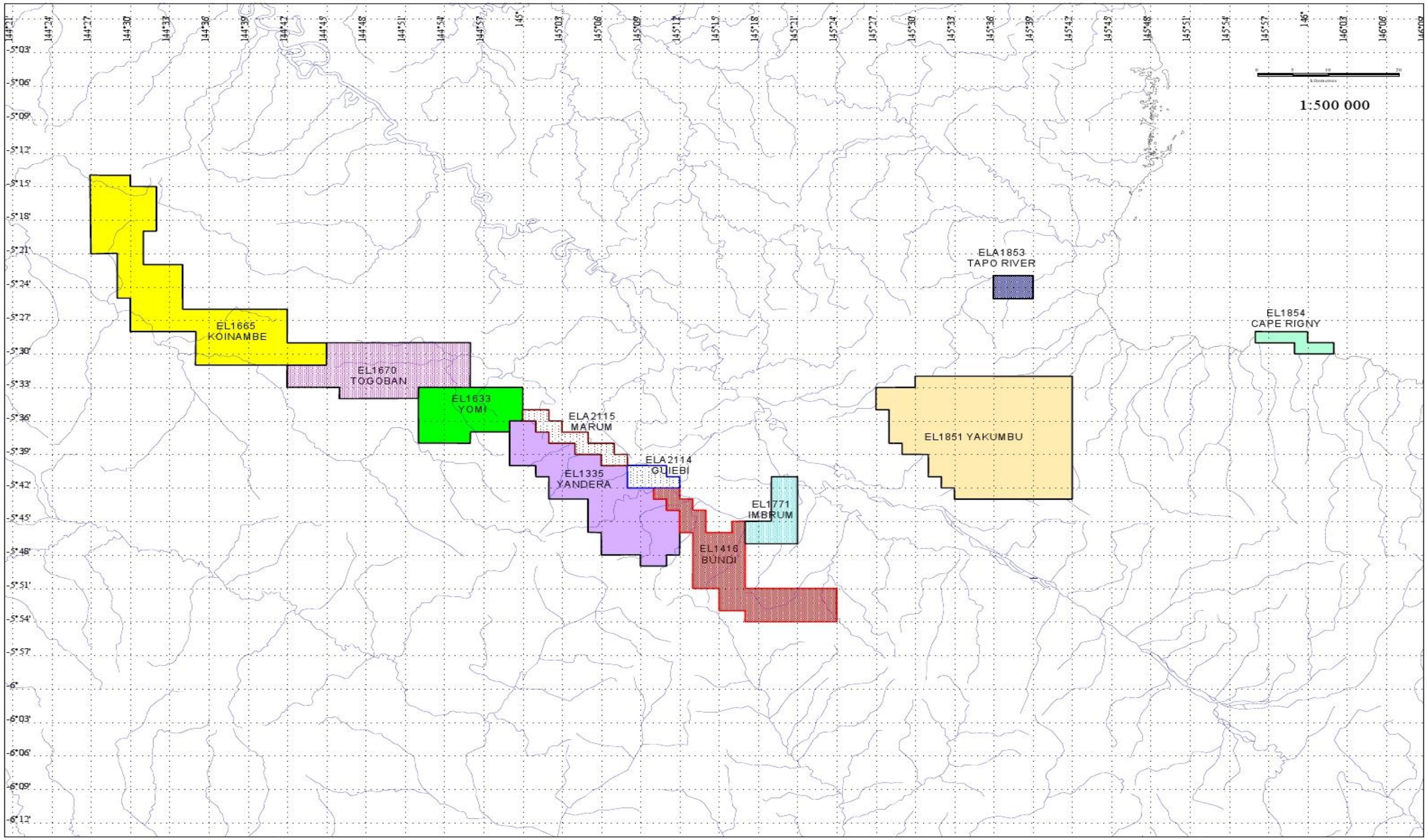
4.2 Tenure

Marengo currently is the holder of five exploration licenses, three exploration licenses for which renewals have been lodged and three exploration license applications. Of the three applications for renewal, two (Koinambe and Togoban) have been refused by the PNG Minister for Mining without giving reasons. In proceedings brought by Marengo the PNG National Court has ordered that the decision be stayed pending the decision being reviewed (refer Note 1 to Table 8). An exploration license entitles the holder to exclusively explore for minerals for a period of two years as well as the right to apply for a mining lease (ML) or a special mining lease (SML). An ML permits the holder to exclusively mine the lease for a period of up to 20 years with the right to apply for a renewal up to 10 years. An SML is for large scale mining operations. The EL holder must also be a party to a Mining Development Contract with the state. Prior to the grant of an SML, the Minister is required to assemble a development forum to consider the views of the persons and authorities whom the Minister believes will be affected by the grant of the SML. (MRA, 2012). The Yandera Porphyry Cu-Mo-Au resource is located on EL1335. This tenement was first granted on the 20 November 2003. The current expiry date is the 19 November 2011 and an application for renewal has been lodges (refer Table 8).

Table 8 Marengo Tenement Details					
Name	**Tenement**	**Area (km^2)**	**Grant Date**	**Expiry Date**	**Comments**
Yandera	EL 1335	246.5	20/11/2003	19/11/2011	application for renewal lodged
Bundi	EL 1416	184.7	5/06/2006	4/06/2012	
Imbrum	EL 1771	54.7	21/03/11	20/03/2013	
Tapo River	ELA 1853	20.7			application
Cape Rigny	EL 1854	23.9	29/07/2011	28/07/2013	
Koinambe	EL 1665	353	3/11/2008	2/11/2010	Application decision under review (Note 1)
Yomi	EL 1633	119.0	3/11/2008	2/11/2012	
Togoban	EL 1670	190	25/03/2009	24/03/2011	Application decision under review (Note 1)
Yakumbu	EL 1851	472	12/3/2012	11/03/2014	
Marum	ELA 2115	40.92			application
Guiebi	ELA 2114	23.81			application

Note 1: "The PNG Minister for Mining decided to refuse the applications on 22 April 2012 without giving reasons. In proceedings brought by Marengo, the PNG National Court has granted leave for that decision to be reviewed and ordered that the decision be stayed pending the determination of the proceedings."

Figure 5 Map indicating the extents of Marengo's permits



4.3 Surface Rights

The PNG Mining Act 1992 and Regulation grants the holder access to the property for exploration purposes. The holder is required to compensate the landholders for damages resulting from exploration and development activities.

Preceding the development of the Yandera Copper-Molybdenum-Gold Project it is a requirement that Marengo negotiates compensation agreements with affected landholders. Currently a Land Owners Association (LOA) is being formed. The LOA would undertake the compensation negotiations.

4.4 Royalties and Encumbrances

There are no known royalties, back-in rights or other encumbrances to which the Yandera Copper-Molybdenum-Gold Project area is subject except that upon the issuance of a Mining Lease a royalty would become payable to the State. The royalty has statutory minimum value of 1.25% of f.o.b. revenue or smelter returns, however mining agreements currently provide for a standard 2% royalty value. A Mineral Resource Act production levy of 0.25% of assessable income is also payable.

In addition, as a matter of policy, the state reserves in every Exploration License, the right to elect, at any time prior to the commencement of mining, to make a single purchase of up to 30% equity interest in any mineral discovery arising from the Exploration License. The purchase would be at a price equal to the State's pro rata share of the accumulated exploration expenditure and thereafter, unless otherwise agreed, its pro rata share of exploration and development costs.

4.5 Environmental Liabilities

There are no known environmental liabilities for the Yandera Copper-Molybdenum-Gold Project.

4.6 Required Permits

An Environmental Permit is required when undertaking drilling in order to be permitted to "discharge wastes into the environment". Marengo currently holds an environmental permit for drilling, permit number WD-L2A(105), and an environmental permit for the purpose of water extraction, permit number WE-L2A(81). These permits are issued under Section 65 of the PNG Environment Act 2000 and expire 3 August 2017.

A mining lease and an environmental permit would be required in order to commence mining of the Yandera Copper-Molybdenum-Gold Project.

For the construction of the exploration adit written permission was acquired from the MRA Chief Inspector of Mines on the 26 November 2011.

Marengo submitted a draft exposition of its intent to build and operate an airport within ELA 1771 in the Ramu Valley to the civil aviation authority (CRA Part 139). An airport is no longer being considered.

Progression of the project into development would require a multiplicity of additional permits and licenses. These are outlined in Section 20.

5. ACCESSIBILITY, CLIMATE, INFRASTRUCTURE

5.1 Accessibility

The Yandera Copper-Molybdenum-Gold Project is located approximately 100km from Madang, which is the capital of Madang Province and has a population of approximately 35,000. The project can presently be accessed from Kundiawa approximately 67km by road, from the Highlands highway via Gembogl and Keglsugl, much of which is poorly maintained four wheel drive track. Construction and operational access would be via a 40km new road spur from the Madang Lae Highway. The area is mountainous and, in the absence of acceptable quality roads, the project is presently almost exclusively accessed by helicopter.

5.2 Climate

The area experiences high rainfall (3.5 to 5 metres per annum), with higher intensity during the November to April monsoon season. During the monsoon season exploration field work is suspended. Temperatures range from 15^{o}C to 25^{o}C throughout the year.

5.3 Proximity to Population Centre and Transport

The Yandera Village, with a population of about 1,500, is about 2km from the proposed pit boundary and potentially closer to other infrastructure components of the project. There are approximately 500 structures within the Yandera area footprint. These range from very few fully habitable and maintained hut dwellings through to more substantial accommodation used for housing and outbuildings.

The following table (Table 9) shows the population of nearby cities and the "as the crow flies" distances from the project site. Distances by road are always greater, sometimes substantially so, due to the nature of the seismically active mountain ranges.

Table 9 Nearby Cities Data

City or Town	Population	Direct Distance from Project Site (Est.)
Lae	90,000	320
Madang	35,000	95
Goroka	25,000	60
Mt Hagen	45,000	120

Apart from these larger towns, there is a dense network of rural villages and settlements. Population data is incomplete, but suggests that "normal" village population lies between 150 and 500 persons. The villages comprise cleared areas with elevated home and community structures constructed of local materials.

There are no overhead power line services or telephone lines in the rural areas. What rural tracks and roads do exist, are narrow, steep, unsealed and with tight corners. Water is obtained from river water sources.

Madang is the closest coastal city and its airport has regular connecting flights to Port Moresby with international connections. Domestic connections to Lae, Wewak and Manus Island are less frequent. Planes are limited to about 40 seat size.

The Madang port main wharf can accept ships to about 8m draft, but there is no permanent wharf craneage. General cargo frequency is low. There are fuel unloading facilities and a tank farm. A long established industrial area on the Madang Harbour frontage is the site for a moribund woodchip production and export facility with berthing capacity for up to 40,000 tonne ships and a luffing shiploader. The Lae port is much more highly trafficked and is equipped for handling heavy items and bulk cargoes.

Construction and major operations materials would be imported either through Madang or Lae ports. However, Lae, with its larger port and more extensive wharf and unloading facilities, is able to accept larger ships and has higher shipping frequency. Moreover, its road connection to the Yandera site, although appreciably longer than that from Madang, is more secure and reliable. It is therefore intended that materials for the Yandera Project would be imported through Lae.

The Madang city has a population of about 35,000 people, has a hospital, schools and two universities, golf course, government facilities, harbour with the main public berth able to take ships of about 8m draft, harbour warehousing, fuel farm, floating dock, small boat harbour, recreation and tourist facilities, retail district, connection to a grid drawing power from a hydro station on the upper Ramu River, supplementary local diesel power generation and, in general, the facilities to be expected from a city that size which is the seat of local and provincial government. There is adequate fixed line and mobile phone communications capability.

5.4 Climate and Operating Seasons

The climate conditions do not require any specific time periods or seasons to operate. Operations can continue all year round with suitable plant and infrastructure in conjunction with careful management.

The climate of the region is classified as wet tropical. Rainfalls are high ranging between about 3.5m and 5.0m per year over the project area, temperatures are relatively mild, being typical equatorial on the coast to mild with cold nights in the mountains and wind speeds are low. The area is not cyclonic.

5.5 Surface and Mining Operation Infrastructure

The current infrastructure supports exploration drilling and early project phase activities such as environmental and social impacts assessments (refer Figure 6). The facilities are extensive and include accommodation, offices, mobile equipment, water supply and treatment systems, core sheds, mobile power generators, supply and logistics offices, maintenance workshop, warehouse, communications and medical facilities to support a site team of circa 100 employees with supplementary casual employment support from the local community. These employees include:

- Project Development Team
- Exploration drillers
- Geologists
- Technical support staff
- Community Relations staff
- Environmental staff
- Health care and medical staff
- Camp and Infrastructure Support
- Supplies and Logistics services

5.6 Potential Tailings Dam and Waste Disposal Areas

A valley adjacent to the mine, given suitable water management provisions, is judged suitable for a combined waste and tailings disposal facility.

5.7 Surface Rights

Issue of mining and operations permits are dependent on agreements first having been struck with the relevant landholders. A Landholders Association has been formed and negotiations are due to commence shortly.

Figure 6 View of Current Site Infrastructure

6. HISTORY

6.1 Ownership History and Exploration History

Outcropping copper mineralisation close to the Yandera village was first investigated by the Australian Bureau of Mineral Resources geologists in the mid 1950s and early 1960s. Kennecott Exploration undertook the first systematic exploration of the project area from 1965 to 1972. During this period they completed stream sediment, soil and rock geochemistry programs, and undertook detailed geological mapping, and completed several magnetic and induced polarisation surveys as well as the drilling of 12 diamond holes (approximately 2,300m) (Grant and Nielsen, 1975).

From 1973 to 1975 both Broken Hill Proprietary Company Limited (BHP) and Amdex Mining Limited jointly completed an additional 31,000 metres of diamond drilling. They also completed further geochemical mapping and contour trenching programs. This work led to the identification of the main prospect areas of Gremi, Omora and Imbruminda.

Marengo acquired an interest in the Yandera Project in 2005 by entering into a 50:50 Joint Venture with Belvedere Resources (a private company). Marengo later acquired 100% of the Yandera Project through purchasing Belvedere's interest in the project.

6.2 Resource History

Several resource estimates were completed for the project in the 1970s, however these pre-date all versions of modern reporting Codes. In 2007 an indicated resource of 163 Mt at 0.49% Cu equivalent and inferred resource of 497 Mt at 0.48% Cu equivalent was estimated by Golder Associates (Golder) in accordance with JORC (2004).

A recent resource estimate at Yandera prepared in accordance with JORC (2004) guidelines was completed by Golder in August 2008. This resource was based on 175 diamond drill holes (57,000 metres) including drilling completed by Marengo from 2006 to 2008. The interpolation method used by Golder was by ordinary kriging and included estimations for Cu, Mo and Au. Rhenium was also estimated using a linear regression based on Mo grades. The tables below (Table 10 and Table 11) are a summary of the Golder 2008 estimates.

Table 10 Yandera Project Resource Estimate Copper - Molybdenum (after Golder, 2008)				
Cut-off (%CuEq)*	**Tonnes (million)**	**CuEq (%)**	**Cu (ppm)**	**Mo (ppm)**
INDICATED RESOURCE				
0.20	527.1	0.38	2,793	104
0.25	410.5	0.43	3,109	118
0.30	314.5	0.48	3,413	135
INFERRED RESOURCE				
0.20	766.4	0.33	2,488	82
0.25	519.3	0.38	2,879	94
0.30	351.9	0.43	3,275	106

**Cu Eq. calculated as [Cu + (10 x Mo)] (ie copper @ US$2/lb and molybdenum @ US$20/lb)*

The Copper-Molybdenum resource includes the following by-product metals:

Table 11 Yandera Project Resource Estimate – By Products (after Golder, 2008)				
Cut-off (%CuEq)*	**Tonnes (million)**	**Au (g/t)**	**Ag (g/t)**	**Re (ppm)****
INFERRED RESOURCE				
0.20	1,293.5	0.08	1.35	0.07
0.25	929.8	0.08	1.46	0.08
0.30	666.4	0.09	1.56	0.08

**Cu Eq. calculated as [Cu + (10 x Mo)];*
*** Rhenium estimated by regression utilising Mo grade*

The most recent resource estimate at Yandera prepared in accordance with NI 43-101 and JORC (2004) guidelines was completed by Golder in April 2011. This resource was based on 345 diamond drill holes (113,715 metres) including drilling completed by Marengo from 2006 to January 2011. The interpolation method used by Golder was by ordinary kriging and included separate estimations for Cu, Mo, Au and Ag. Rhenium was also estimated using a linear regression based on Mo grades.

The resource includes estimates for Copper (Cu), Molybdenum (Mo), Gold (Au), Silver (Ag) and Rhenium (Re). Measured, Indicated and Inferred Resources have been reported for Cu and Mo at Copper Equivalent (CuEq) grades (Table 12). The Au, Ag and Re resource is all inferred (Table 13) (Golder, 2011).

6.3 Previous Production

There has been no previous production at the project.

6.4 Previous Analyses

A Technical Report titled “Revised Technical Report – Effective November 2007” was issued in March 2008 which included suppositions and/or assumptions concerning mine plans and viability. Premises on which those were based, such as transport of mined material to a coastal treatment plant using a combination of conveyors and rail and availability of sufficient power from hydro sources along with less important factors, are no longer applicable. Those matters are currently being reassessed.

Table 12 Yandera Mineral Resource - Cu and Mo (after Golder, 2011)

CuEq* Cut-Off Grade	Mineral Resource Category	Mt	CuEq%	Cu ppm	Mo ppm
0.20	Measured	132	0.53	3,700	167
0.20	Indicated	490	0.35	2,772	89
0.20	**Combined Measured + Indicated**	**622**	**0.39**	**2,968**	**108**
0.20	Inferred	1,017	0.33	2,840	68
0.25	Measured	124	0.55	3,826	173
0.25	Indicated	349	0.40	3,126	106
0.25	**Combined Measured + Indicated**	**472**	**0.44**	**3,309**	**125**
0.25	Inferred	647	0.39	3,327	81
0.30	Measured	113	0.57	3,980	181
0.30	Indicated	245	0.46	3,468	124
0.30	**Combined Measured + Indicated**	**359**	**0.50**	**3,629**	**143**
0.30	Inferred	417	0.45	3,838	96

** CuEq - Cu Equivalent is calculated as (Cu% + (Mo% x 10))*

Table 13 Yandera Mineral Resource - Au, Ag and Re (after Golder, 2011)

CuEq Cut-Off Grade	Mineral Resource Category	Mt	Au g/t	Ag g/t	Re ppm**
0.20	Inferred	1,639	0.07	1.50	0.05
0.25	Inferred	1,119	0.08	1.58	0.05
0.30	Inferred	776	0.09	1.68	0.06

*** Re is calculated by regression against Mo*

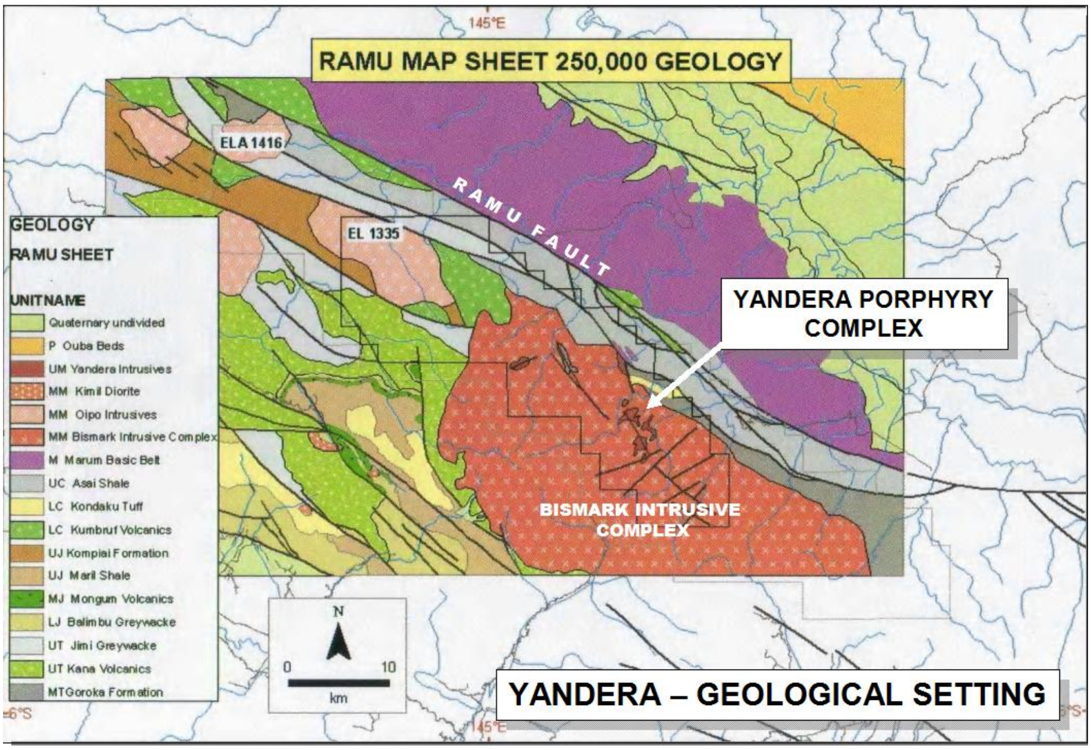
7. GEOLOGICAL SETTING AND MINERALISATION

7.1 Regional Geology

The regional and prospect geology of Yandera is well documented by Meldrum (2007), Titley et al (1978) and Grant and Nielsen (1975).

The Yandera Project lies in the New Guinea Copper fold belt, a province comprised predominantly of deformed Mesozoic and Tertiary rocks. Lithologies within the belt include clastic sediments, mafic to intermediate volcanic and minor limestones. These lie within an elongate northwest striking belt dominated by northwest striking structural fabric related to the collision of the Indo-Australian plate with island arc complexes in Miocene to Pliocene times. Figure 7 below describes the regional geology at and around the Yandera project area.

Figure 7 District Geology of the Yandera Project Area (after Meldrum, 2007)



7.2 Local Geology

The Yandera porphyry Cu-Mo-Au deposits lies within the core of the Miocene Bismarck Intrusive complex. This complex is a batholith comprised predominantly of granodiorite with lesser amounts of gabbro and quartz monzogranite. The Bismarck Intrusive complex is bounded to the north by the northwest striking Ramu Fault Zone and the upthrust sediments and ophiolites of the Ramu Ophiolite Complex. There is an interpreted flexure in the Ramu Fault zone to the north of Yandera which Meldrum (2007) notes may have played an important role controlling extension and mineralisation at Yandera (Figure 7).

7.3 Mineralisation

Five main mineralisation styles are identified at Yandera including oxide, transition (oxide plus sulphide material), supergene (re-deposition of leached copper to the oxide/sulphide interface), enriched (deposition of covellite or chalcocite from acidic magmatic fluids) and hypogene. Most mineralisation is hypogene, with the main sulphides being pyrite, molybdenite, chalcopyrite, and bornite and these are generally distributed in a zoned arrangement relative to mineralised porphyry centres (Meldrum, 2007). Pyrite typically forms a halo around the deposit, and is observed to oxidise to form a clay rich rim. This halo grades into a pyrite - molybdenite zone which typically occurs in fracture fill veins, which in turn grade into quartz - molybdenite - pyrite, quartz –chalcopyrite - molybdenite - pyrite, quartz-chalcopyrite - molybdenite - pyrite +/- magnetite vein dominated zones towards the core of the porphyry mineralised system. Veining is dominated by quartz – magnetite - chalcopyrite – bornite at the core of the system.

Of note is that the major economic elements (Cu, Mo and Au) are partitioned and distributed differently due to the complex nature and distribution of alteration and mineralisation. Meldrum (2007) notes that there may have been a large amount of remobilisation of mineralisation from the core of early porphyry mineralisation cores into the outer molybdenum haloes by later porphyry mineralisation events.

At Yandera six main prospect areas have been identified; Mumnnogoi, Omora, Gremi, Imbruminda, Gamagu and Dimbi, which form a broadly northwest striking zone of mineralisation, wrapped about a central quartz rich low grade core. The bulk of mineralisation is hosted by the Gremi, Omora and Imbruminda prospects which are located relatively close to each other as depicted in Figure 8 and Figure 9. A typical cross section of the mineralisation geometry is provided for review also in Figure 10.

Figure 8 Local Geology of the Yandera Project Area (after Meldrum, 2007)

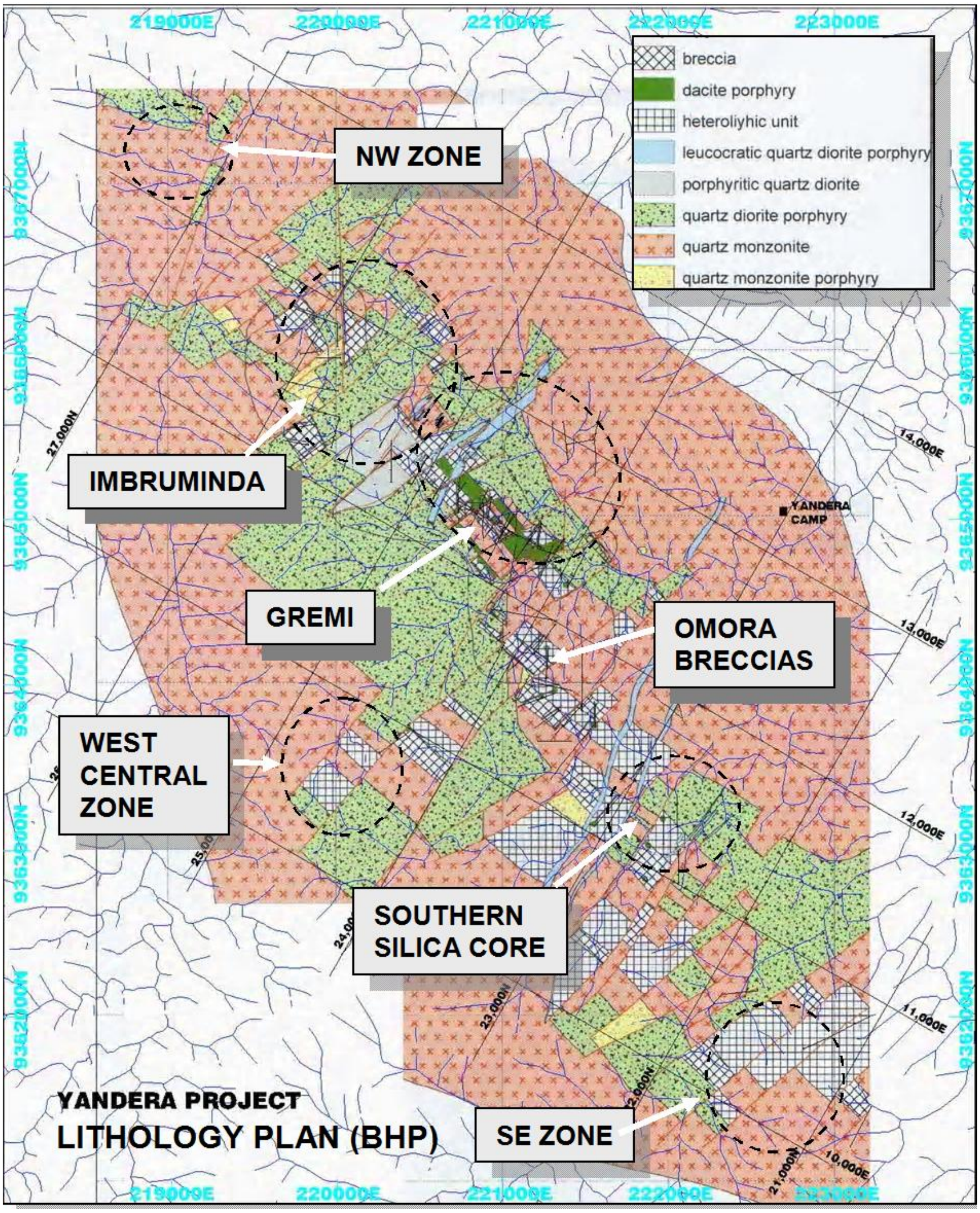


Figure 9 Yandera Project Area – Prospect Areas and resources (after Marengo, 2012)

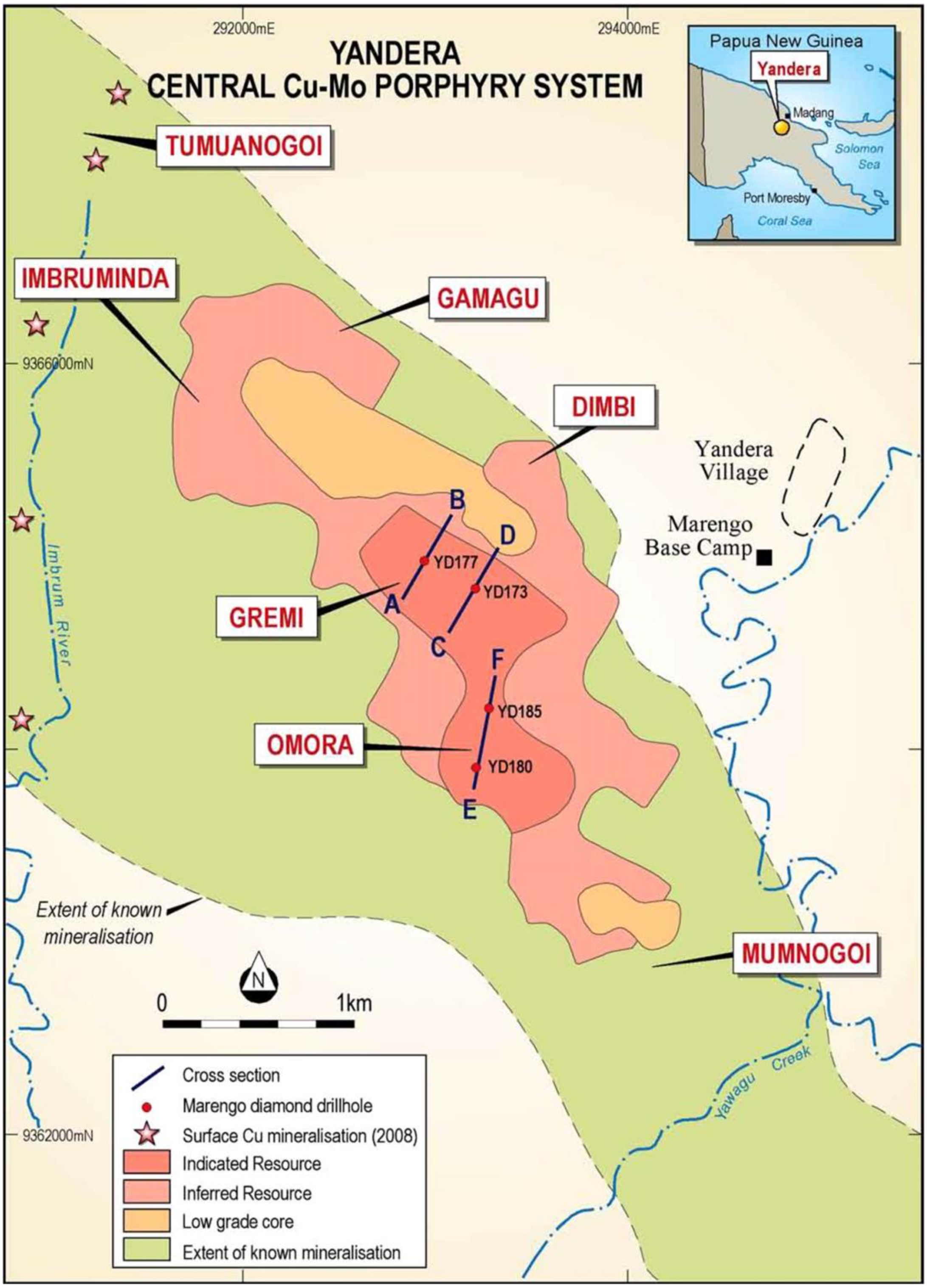
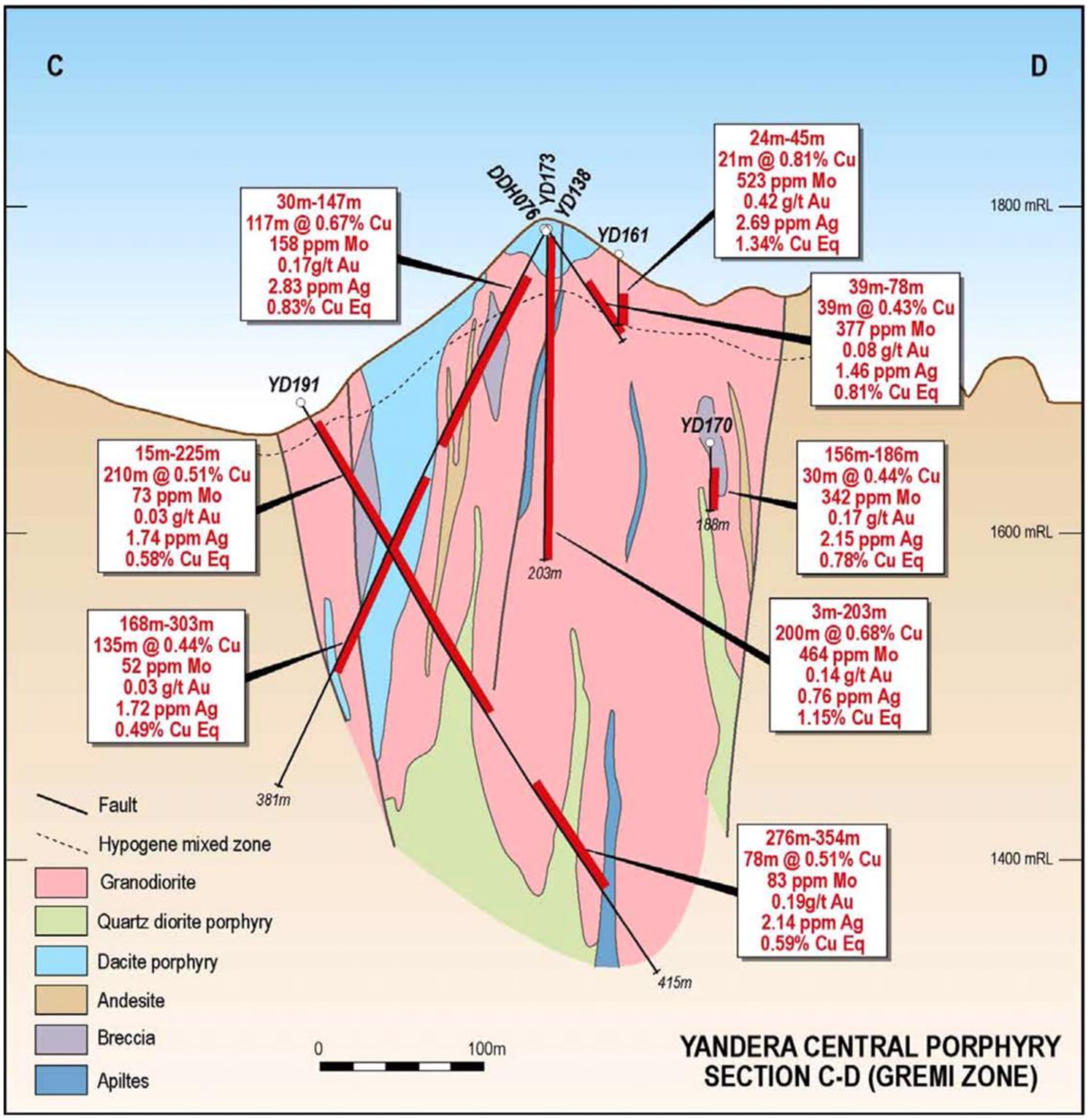


Figure 10 Cross Section Gremi (C-D) (after Marengo, 2012)



(Refer to Figure 9 for cross section location)

8. DEPOSIT TYPE

The Yandera porphyry deposit has undergone a complex history of mineralisation and deformation. Meldrum (2007) notes that 30 different porphyritic intrusive varieties have been identified from logging which can be grouped into five broad categories related to age and likely depth of emplacement . Earliest porphyry phases were probably intruded when the complex was relatively deeply buried (>3km), with subsequent porphyry, mineralisation and alteration phases reflecting progressively shallower depositional levels related to an overall extensional tectonic regime. Breccias are interpreted to be locally important controls on mineralisation.

Alteration is extensive and has occurred in multiple over-printing phases with multiple mineralisation sources. Meldrum (2007) identifies thirteen different types of alteration with the three most important alteration facies related to mineralisation being potassic, intermediate argillic and sericitic alteration.

Porphyry Cu-Mo-Au deposits

Porphyry copper deposits are hydrothermal deposits, associated with porphyritic intrusive rocks and fluids. The fluids result from the cooling of magma to rock and may interact with meteoric water. Primary (hypogene) mineralisation is mostly structurally controlled and is spatially and genetically related to felsic to intermediate porphyritic intrusions. Consecutive layers of hydrothermal alteration usually enfold a core of mineralisation in hairline fractures and veins, resulting in stockwork. Typical copper values for these mineralised systems range between 0.4% and 1% copper with smaller amounts of metals usually molybdenum, silver and gold.

Characteristics of porphyry copper deposits include:

- Typically the deposits are associated with multiple intrusions of porphyritic dykes of diorite to quartz monzonite composition.
- Breccia zones with sulphide mineralisation between or within fragments.
- Deposits often have
  - An outer epidote-chlorite alteration zone.
  - A central potassic zone with secondary biotite and orthoclase alteration. Usually associated with most of the mineralisation.
  - Fractures are commonly filled or coated with sulphides or filled by quartz with sulphides.
  - The highest grade mineralisation is typically associated with closely spaced fractures of varying orientations.
  - Supergene enrichment of the upper portion of the deposit may occur.

9. EXPLORATION

Airborne magnetic and radiometric surveys were flown during 2009 and are being extended in 2012. The area covered by the two surveys is indicated in Figure 11. The survey was a helicopter mounted survey flown on 100m line spacings at an average height of no more than 100 metres.

From the survey the significance of structure acting as a conduit for fluid flow and magmatism has been emphasised. This has led to the identification of a number of exploration targets indicated on Figure 12.

Figure 11 Areas covered by Airborne Geophysical Surveys at the Yandera Project

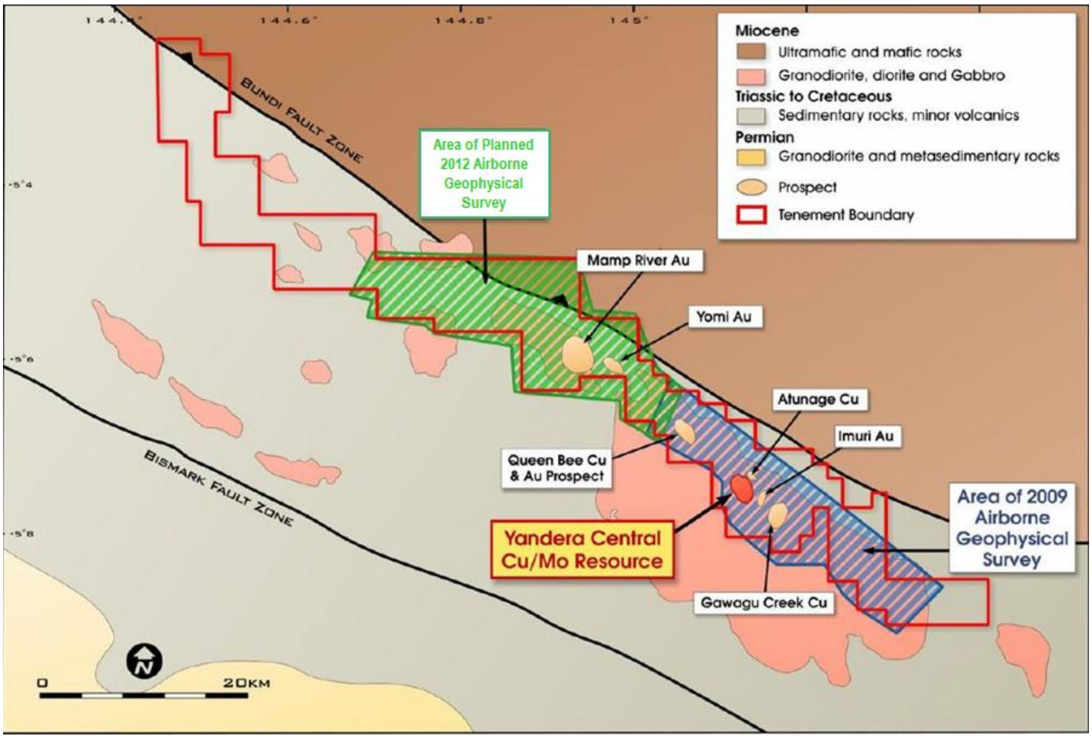
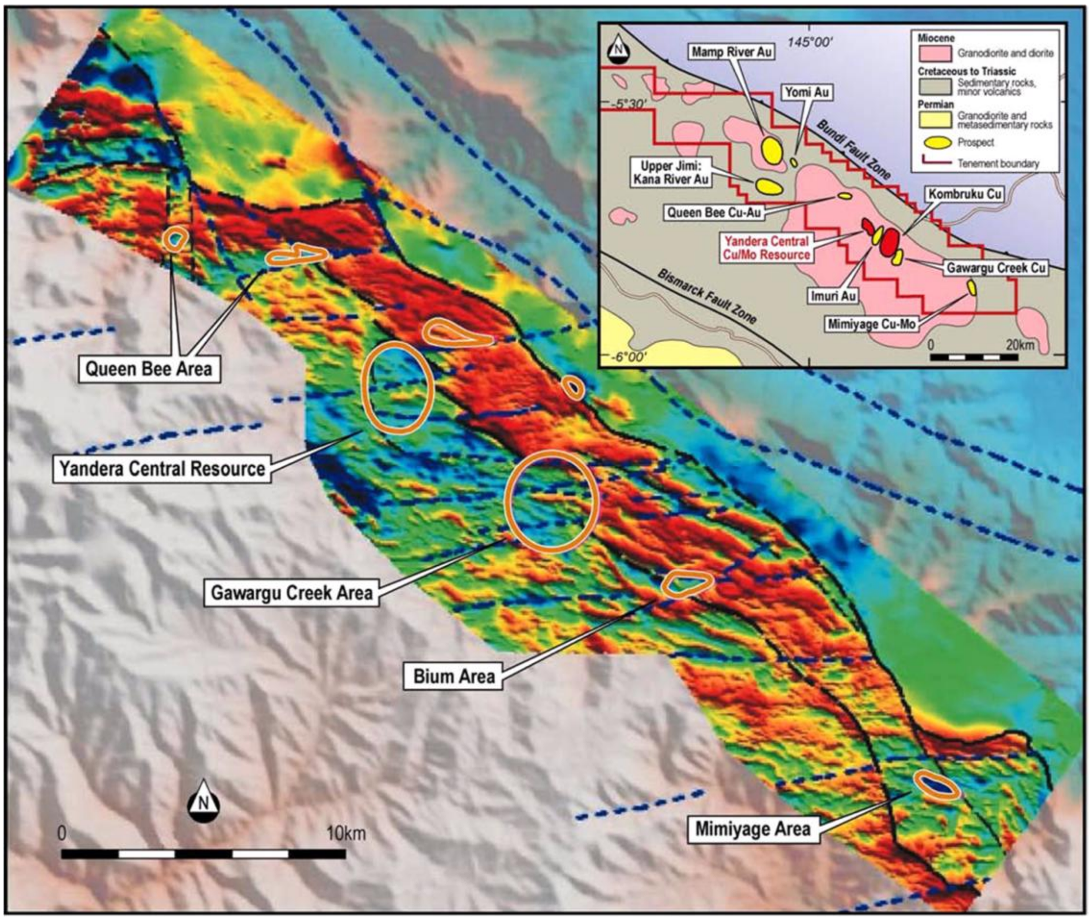


Figure 12 Geophysical Survey Results



During the first half of 2011 Marengo undertook a ridge and spur soil sampling programme over the Dirgi Mountain area approximately 4km southeast of the Yandera Deposit and covering an area of approximately $15km^2$. This followed up on an airborne geophysical survey flown late 2009 by UTS Aeroquest. The results of the airborne survey as well as the soil chemistry were used for drill targeting and exploration drilling which is currently underway in this area with an initial seven hole programme.

During the second half of 2011 a stream sediment programme in the Yomi (EL1633) and Togoban (EL1670) areas was designed and implemented. The Yomi sampling was mostly completed by the end of 2011 and will recommence during the dry season of 2012. Follow up work is currently being designed and other activities for the upcoming dry season planned.

Sample density in all cases depends on where it is practicable to obtain samples with a view to the type of sample, material suitability and safety. Analysis of samples follows the same quality procedures as employed for drill core (see Section 11.1).

10. DRILLING

10.1 Drilling Data

The Yandera project has been drilled by several companies over the projects history. Initial exploration was completed by Kennecott Exploration from 1966 to 1972 and during this time 12 diamond holes (DDH001-DDH012) for 2,275m were drilled. From 1973 to 1980 a BHP/Amdex Australia JV completed an additional 90 diamond holes (DDH13 – DDH102) for 30,942m.

No further drilling was conducted on the project until 2007 when Marengo began drilling. Since then Marengo has completed an additional 363 diamond holes for 112,117m (YD103-YD465).

The terrain in the area is rugged, with drilling generally having to be completed as fans from available drill platform positions. Drill spacing ranges from nominally 50 by 50 metres in the main parts of the deposit to approximately 100 by 100 m spacing and greater on the deposit margins.

10.2 Grids and Collar Surveys

The grid used for the project is AGD 66 Zone 55. Drill-holes completed by Marengo were set out and picked up after completion using a handheld GPS. Repeat readings at collar sites indicate an error of +/- 0.8m. Completed holes are periodically picked up by a local surveyor and are then used in the drilling database. Holes from the 1960s and 1970s were surveyed using conventional surveying techniques.

Drilling completed by Kennecott and BHP/Amdex in the 1960s and 1970s (DDH001 – DDH102) have single shot down-hole camera information for most angled holes, albeit at relatively wide intervals (up to 250m down-hole). Many holes were drilled vertically. Due to the wide spacing of surveys from this early drilling there is some potential for drill holes paths to be incorrectly located. However given the style of deposit and the broad widths of mineralisation it is the opinion of Ravensgate that any errors introduced will not have a significant impact on resource estimation work.

All recent drilling completed by Marengo has adequate downhole survey data (YD103-YD465). Surveys are taken every 50 metres downhole using a digital multi shot camera. The drillhole collar locations are indicated on Figure 13.

Figure 13 Drillhole Collar Locations for Historic and Drilling Undertaken by Marengo

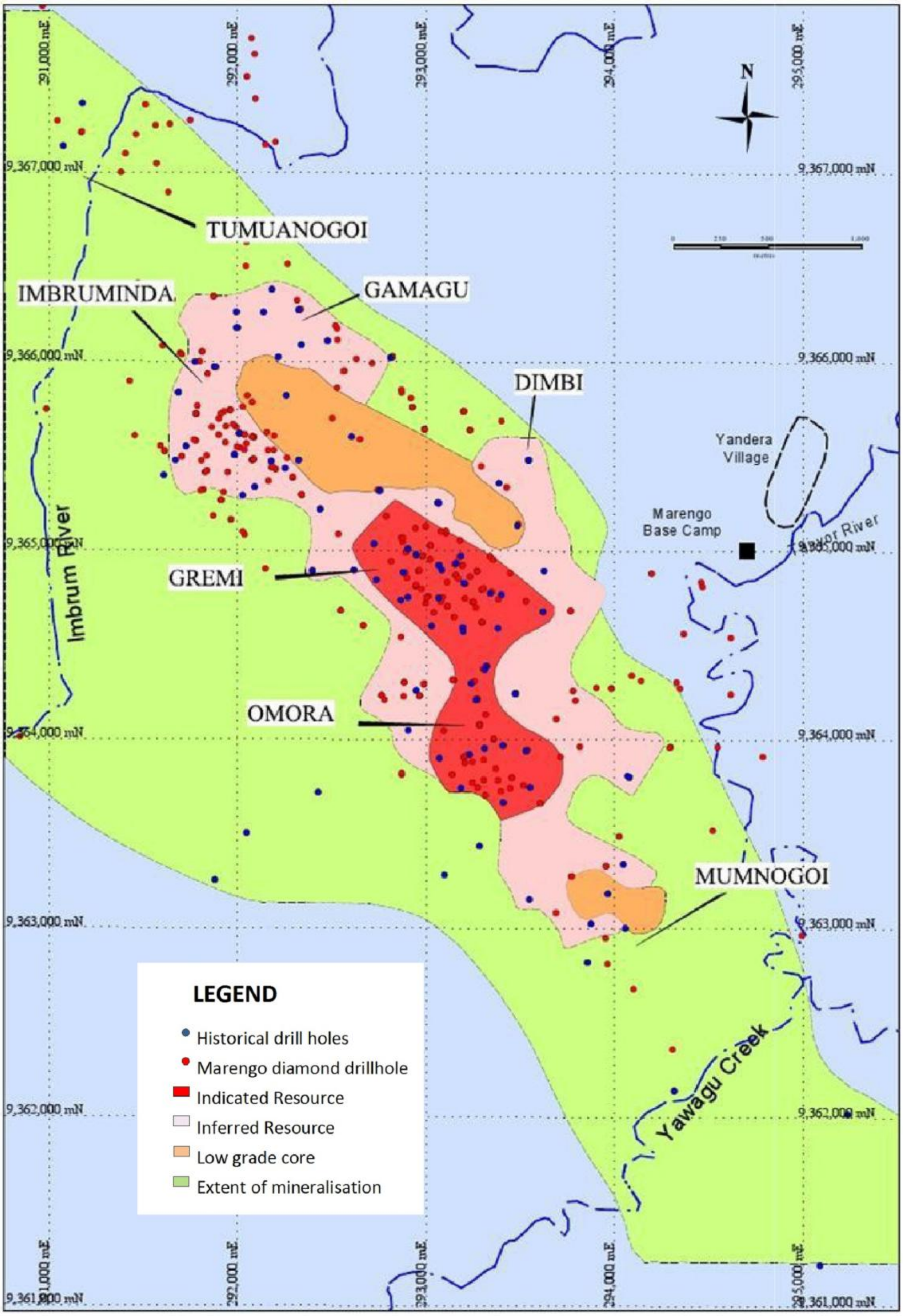
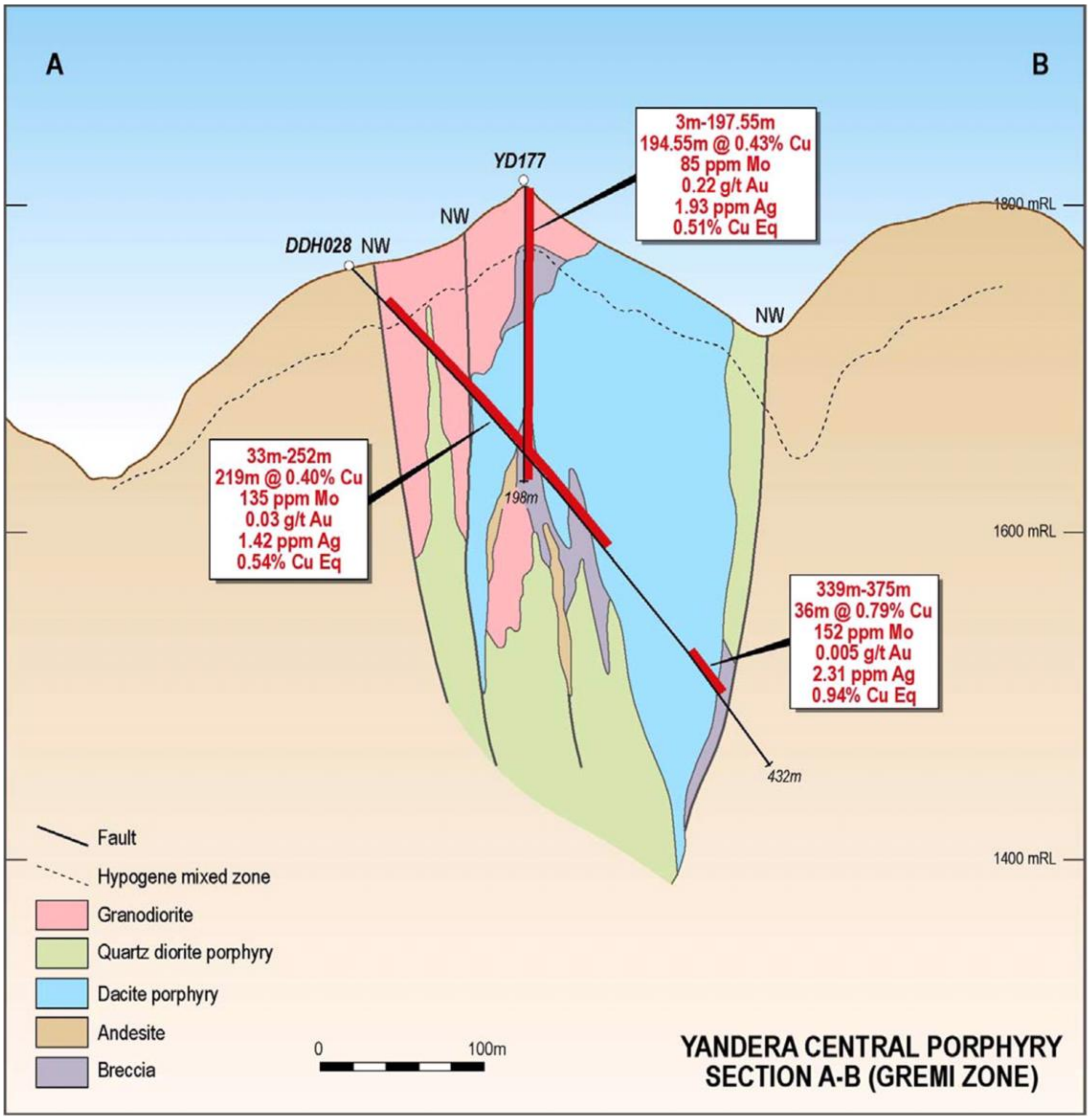
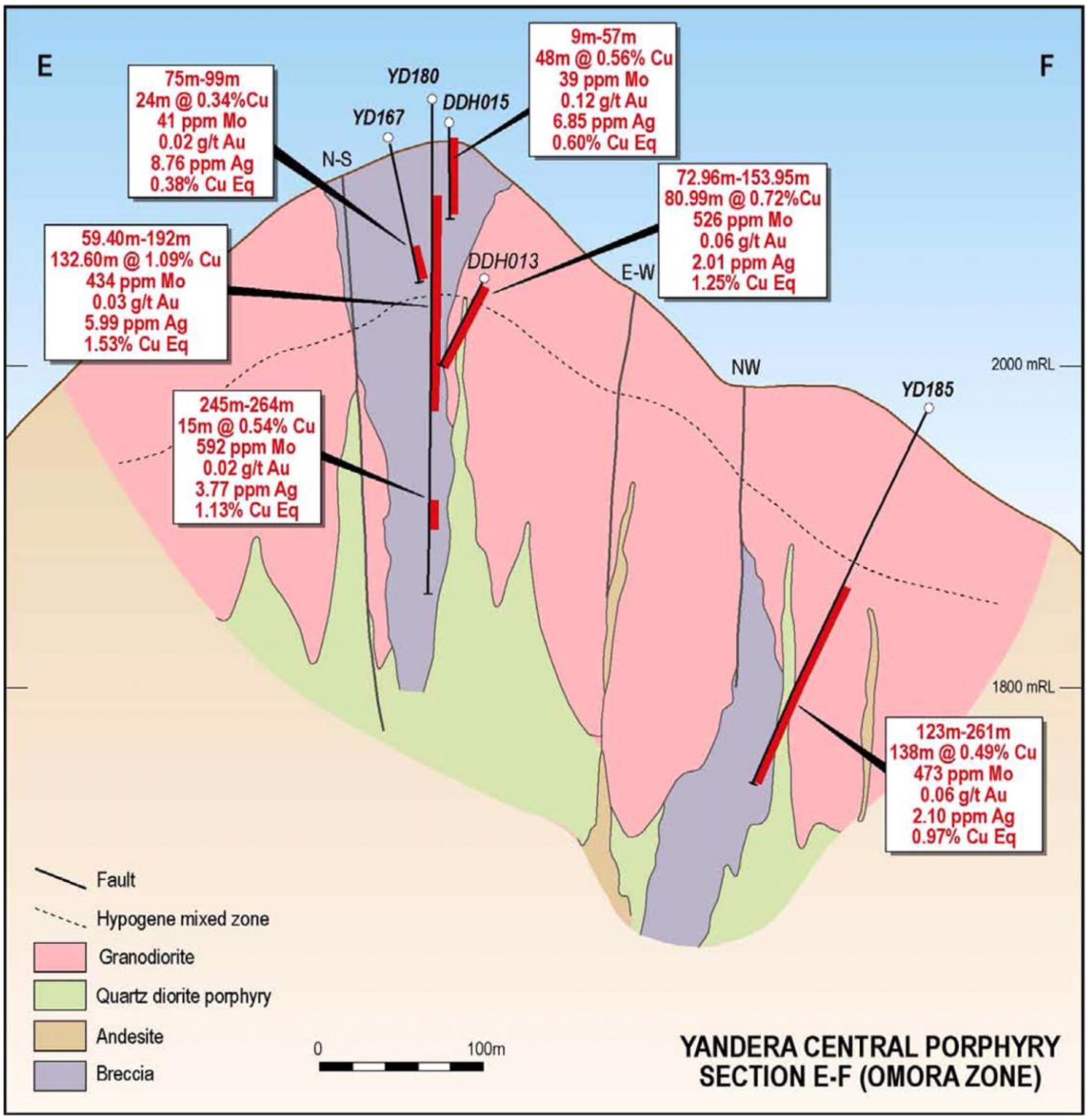


Figure 14 Cross Section Gremi (A-B) (after Marengo, 2012)



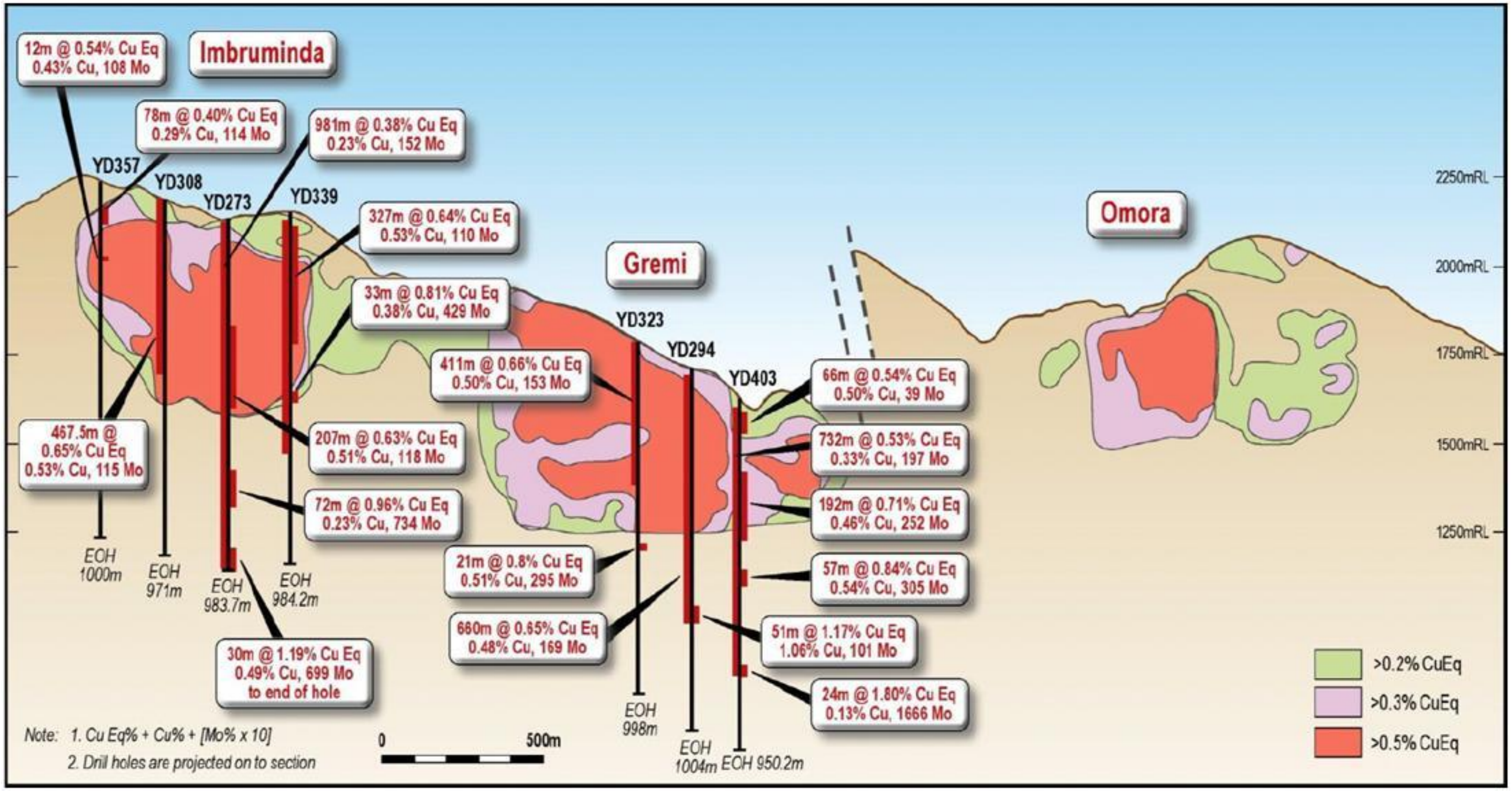
(Refer to Figure 9 for cross section location)

Figure 15 Cross Section Omora (E-F) (after Marengo, 2012)



(Refer to Figure 9 for cross section location)

Figure 16 Long Section of the Yandera Central Project (after Marengo, 2011)



10.3 Drillhole Data Utilised in the Mineral Resource Estimate

The drill-hole data available for the new April 2012 resource estimates was provided by Marengo in standard Microsoft Access format. It was separated as tables representing collar survey, down-hole survey data and as down-hole logging or sample interval data describing broad lithology and associated structural aspects. A large assay data table was also supplied detailing all the relevant analytical data, particular for the priority analytical element Cu as well as ancillary elements Mo and Au as well as some additional elements including Ag and Re. February 10th, 2012, is the effective date with respect to drilling data availability.

The drilling data was initially formatted for loading and use with the MineSight software package. The MineSight software uses an established and comprehensively tested method of loading drill-hole data that identifies where present the majority of data integrity errors or queries. A standard MineSight report is generated that identifies any missing or duplicate drill-hole collars, down-hole surveys, sample intervals or assay data. Ravensgate during data formatting and loading into their systems observed no obvious or apparent data error and is generally satisfied that the Marengo Drilling database is in an adequate well kept condition.

Further visual checking of data on screen and with respect to previously generated cross-section data also revealed no apparent or obvious drill data concerns.

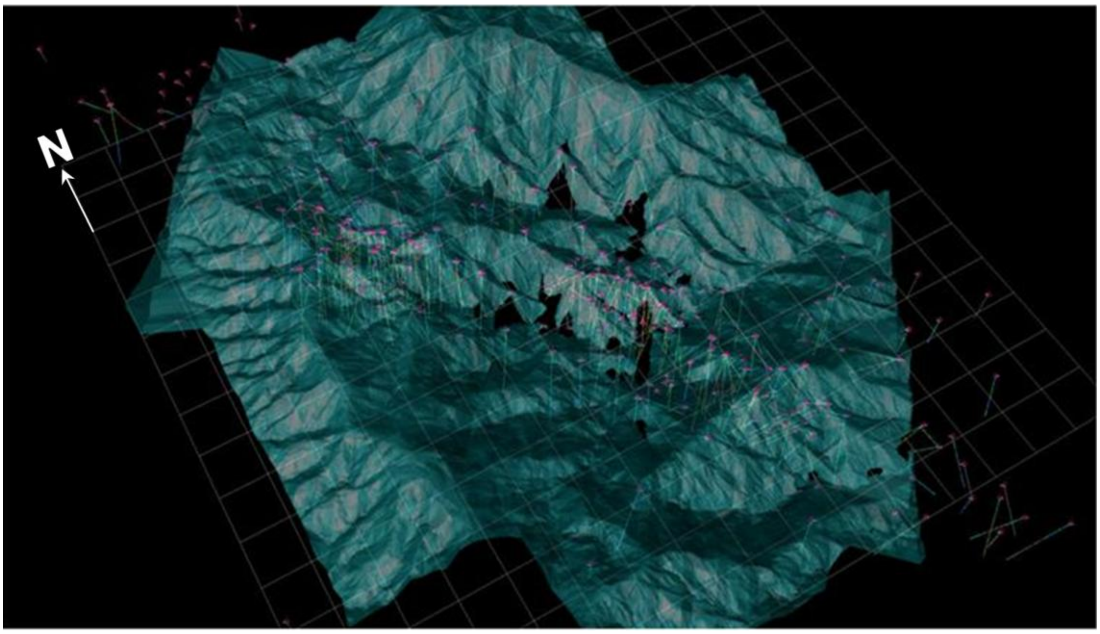
The drilling data-set loaded by Ravensgate consisted of 462 diamond drill-holes. A sub-set of 18 of these drill-holes were specifically used to acquire metallurgical test samples and the assays of these samples were not used directly in the resource estimation because sample intervals were combined prior to assay in a way that is not compatible with the other drill-holes (See Section 13.4). All drill collars were surveyed in the AGD66 (Zone -55) grid system. The availability and access to suitable drilling locations is limited by topography such that many differently oriented drill-holes (with dips of 30-90 degrees) were often drilled from the same drill-pad location. The planned section spacing was nominally on 100m sections and down to a nominal 50m in some of the more heavily mineralised zones such as at Imbruminda and at 50 x 25m spacing in parts of the Gremi Area. The drill section or drill-hole spacing at Omora was nominally ~150m.

Sample intervals used for the majority of drill-holes in mineralised domains was 3m, however at some locations sample intervals of less than 1m were used and approximately 450 sample intervals overall were equal to or greater than 4m in length.

All ‘un-sampled’ or missing assay intervals were coded as the default “-2.00” value as per the standard MineSight protocol. These intervals were treated as ‘null’ values in subsequent drill-hole compositing, statistical analysis and block model interpolation.

Figure 17 below shows the drilling at Yandera in the context of the current topographic terrain – (Drill-hole collars pink circular points).

Figure 17 Layout of the current drilling pattern at Yandera draped on the topographic terrain, Azim =30, Dip-60



11. SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Sampling Method and Approach

11.1.1 Drill Data collection and Geological Logging

Drill core is transported from the field to Marengo's Yandera field office for logging, cutting, sampling and storage. Drill core is geologically logged by site geologists onto paper log sheets with data then transferred to Excel spreadsheets for uploading into the Marengo Datashed database. Marengo has developed a comprehensive logging scheme that captures the critical elements of the deposit geology and drilling information. A second field camp, Frog Camp, established to store and process core became operational during the first quarter of 2012. The Frog Camp also has an assay sample preparation facility operated by Intertek that became operational on 2 April 2012.

After logging, core is marked up for sampling and photographed. After being digitally photographed, all core is then cut and sampled. Drill core is cut into half cores using a diamond saw or split in half where more friable rock types are present. It is also common practice to wrap fractured core in tape to aid core splitting process. Sample intervals are typically three metres of down-hole length.

One half of the core remains in the core box for a permanent record and the other half is placed in sample bags and dispatched to Intertek in Jakarta using Fire Assay for gold and ICP-AAS for a suite of 35 elements including copper and molybdenum. Assay Sample numbers are assigned in a sequential order. Sample sizes are generally around 9kg, which is sufficient for the style of mineralisation. The remaining half drill core is stored in the original core boxes on site. Of note is that unfortunately the core for holes drilled in the 1960s and 1970s were destroyed before Marengo became involved in the project.

Marengo has implemented a thorough assay QAQC programme with check samples included in each submission every 20 samples. Check samples used included blanks (to check laboratory preparation, cleanliness and laboratory accuracy).

The amount of drilling at Yandera has substantially increased since 2008 and approximately 80% of the available drill-hole data has been added since then by Marengo (Pers. Comm. M. Roberts). The additional drilling since 2008 by Marengo has clearly confirmed the overall tenure of mineralisation and helped define mineralisation boundaries and distribution gradients. While many of the drill-holes are in close proximity on some drill-pads at many locations, there are no specifically designed 'twinned' drill holes available for detailed review of historical data. Some confirmation of mineralisation continuity is demonstrated near surface where holes have been collared together and have similarly oriented down-hole surveys. Future drilling should ideally be aimed at drilling a few twinned holes of the same orientation and spaced five metres apart to help examine short range variability and any effects related to sample duplication.

None of the historical drill core prior to Marengo's involvement is available for sampling and testing.

11.1.2 Sample Quality, Logging and Geologic Interpretation

The quality of geological logging by site geologists appears to be very good. Geological understanding is also good which has led to the development of a robust geological model for the deposit. The Marengo drill core samples have an 80% core recovery for 79% of the samples. From this it can be concluded that sampling is reasonably representative of the mineralisation.

11.1.3 Assays QA/QC

QAQC data from Marengo's drilling was provided to Ravensgate. Marengo has used several Cu and Au certified reference samples at appropriate grade ranges. QAQC samples are inserted every 20 samples (5% of assays submitted). This is an appropriate amount for the type of deposit.

Reported certified reference sample grades are generally within accepted ranges (ie two standard deviations of the mean). Ravensgate suggests that to improve monitoring of QAQC, Marengo should produce a QAQC report on a monthly and quarterly basis that not only monitors standard performance but includes information on any issues with data, assay jobs re-run, identification of lab issues etc. This type of reporting provides a useful record for future resource updates and resource auditing. Ravensgate has seen the March 2012 QAQC monthly report produced by Marengo and views this as an improvement relative to the past practice of relying on consultants.

11.2 Assaying and Analytical Procedures

Samples have been analysed by the Intertek laboratory (Intertek) in Jakarta.

All samples are analysed using two methods namely a 50g fire assay fusion with an AAS (atomic absorption spectroscopy) finish for gold analysis (FA50) and an ICP-OES analysis for the following analytes:

Ag, Al, S, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, Pb, Sb, Sc, Sn, Sr, Ta, Te, Ti, V, W, Y, Zn, Zr.

The ICP-OES (inductively coupled plasma optical emission spectrometry) analysis process involves a multi-acid digest (IC50). Intertek inserts and analyses a set of standards and repeats for internal QC. Intertek provided Marengo with their analytical results initially in electronic format followed by hard copy assay certificates.

Intertek holds the following accreditations which are assessed annually:

- KAN (Kommittee Acreditasi Nasional), the Indonesian version of NATA, to ISO 17025.
- ISO 17025

KAN and NATA are both members of the Asia Pacific Laboratory Accreditation Cooperation.

The Intertek sample preparation facility in Lae, Papua New Guinea is not covered by the accreditation listed above. Marengo staff have visited and approved the sample preparation facility in Lae.

11.3 Adequacy of Sample Preparation, Security and Analytical Procedures

Documentation, assay QA/QC, and previous technical reports indicate that sample preparation and analytical procedures are of high standard. Sample security and chain of custody are considered adequate for the area and style of operation.

12. DATA VERIFICATION

12.1 Data Verification

The deposit statistics for all areas were thoroughly reviewed for sample support considerations using both raw sample data and composite data. A standard 3m length down-hole composite data set was initially examined since this was the 'default' sample length typically used. The compositing, subsequent data processing and statistical analysis, were carried out in MineSight Compass® software.

After examining the localised statistics for copper, molybdenum and gold distributions in the three main Yandera project sub-areas, namely Imbruminda, Gremi and Omora, it was determined that the majority of mineralised domains, particularly the copper mineralisation, display relatively low overall composite population variances and corresponding low coefficients of variation. The composite length of 3m was chosen as a suitable length for mineral resource modelling work as it was deemed that this length was short enough to adequately honour the dimensions of geological and mineralisation domains being modelled. The 3m down-hole composite set was used to examine the probability and spatial distribution statistics for each project area as well as for the semi-variogram modelling studies. The compositing of assay data and the subsequent file generation process was a straight forward 'total drill-hole' down-hole length composite calculation run on all drill-holes.

All of the 3m composites contained within the mineralisation 'containment' wire-frames were used to calculate varigrams. Separate mineralisation domain sets were used for each of the three elements: copper, molybdenum and gold. The resultant parameter data derived from the variogram modelling for each element was used to carry out the block model interpolation runs to estimate each element accordingly.

12.2 Geological Interpretation

12.2.1 Mineralisation Domains and Alteration Domains

The main Yandera porphyry lithologies affected by various phases of hydrothermal alteration events were targeted as the primary material types to be modelled using mineralisation domain construction. These major material type domains are based on new geologic and mineralisation interpretation work carried out by Gabriel Liam and Malai Ila'ava of Marengo. These mineralisation domains include both gradual and sharp chemical and physical discontinuities. The physical changes are interpreted from geological logging information and assay data for the 'priority element' copper as well as the ancillary items molybdenum and gold. The mineralised domains were used to subdivide the deposit into several major mineralised zones based primarily on metal distributions as revealed by analysis of log probability plots for each element by drilling area.

Some of the known fault positions were plotted for reference during the block model construction phase and these are used in some locations to limit the area to which block model interpolation extends. The main northwest-southeast trending fault is particularly important in the Yandera area where it is observed to separate the Imbruminda and Gremi areas from the Omora area.

12.2.2 Interpretation and Composite Flagging

The main mineralisation type domain interpretation strings were developed using drill assay intercepts as presented in a 20m spaced southwest to northeast section plane grid. These strings were adjusted sometimes where necessary to ensure all mineralised material at an approximate +150ppm Cu lower cut-off.

These interpreted sectional polygon strings were then triangulated across adjacent sections to generate representative material type wire-frames which were then converted to 3-D solids and then clipped with the LIDAR topographic surface.

The composited assay data was then numerically coded with the newly generated 3-D geometry solids according to a designated material type domain code regime. In addition to the seven Cu Domains nine mineralisation domains were developed for Mo and ten mineralisation domains were developed for Au. Four different discrete localised AREA domains in the block model were also defined to demark areas where the orientation of the mineralisation zones varies.

The allocation of a set of material type flagging codes to each 'captured-within-wireframe' composited drill hole interval was by direct intersection of composite drill hole traces within the wire-framed 3-D geometry solid triangulations. A coding threshold of 25% of the 3m composite interval was used for all coding in the Yandera Deposit Domains.

All of the composites were coded by firstly the main Copper mineralisation wire-frames (ZONA=1→7), the molybdenum wire-frames (ZONEB=1→9), the gold wire-frames (ZONEC=1→10) and then the respective AREA domain coding sets. Composites falling outside of all these domains are not coded.

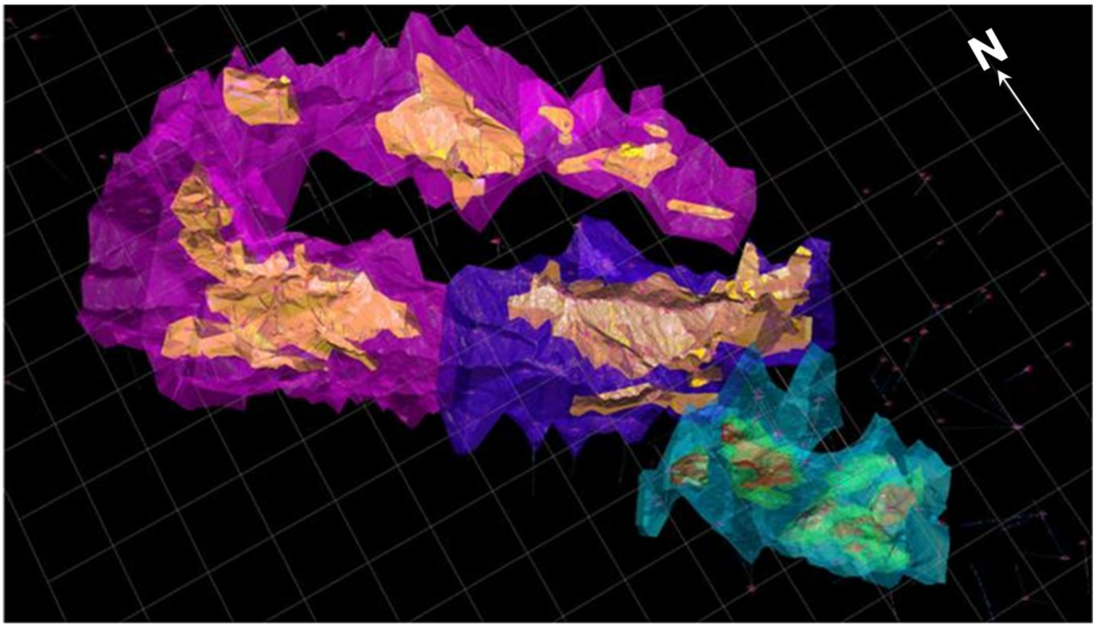
Yandera Mineralisation Domains:

Copper : ZONEA=1→7 - Molybdenum : ZONEB=1→9 – Gold : ZONEC=1→10

The final coded data was extracted and tabulated for review and then distilled into standard Log Probability plots which were used to help determine other statistical parameters related to 'outlier' grades for each element of each domain. In addition, the effect of varying top cuts, particularly upon the observed coefficient of variation, was examined to help determine the most appropriate top cut grade value to be used during interpolation of each domain. Declustering analysis was also performed for preliminary data review using MineSight Compass^{tm} and the 'moving window' declustering analysis method for a range of cell dimensions to assess the stability of the declustered mean. Overall the declustered mean of the composites under consideration for the Yandera areas did not show a large variation from the 'raw' mean.

Figure 18 shows the general copper domains defined by geological and mineralogical interpretation.

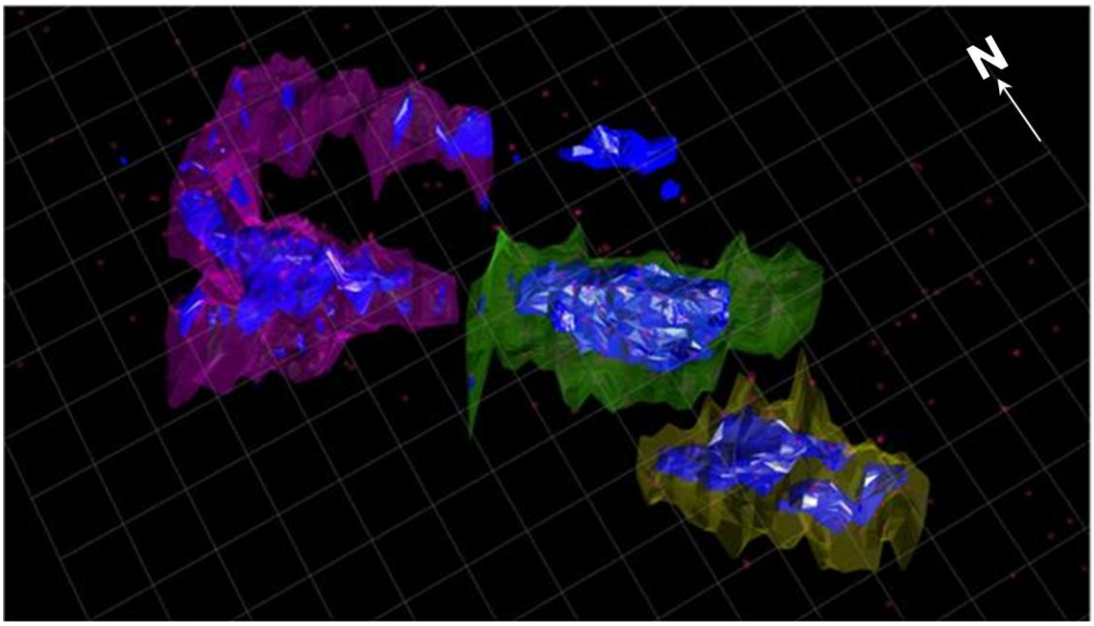
Figure 18 Yandera Cu Mineralisation Domains – Oblique View – Imbruminda Cu Domains envelope (pink), Gremi Cu Domains envelope (purple) and Omora Cu Domains envelope (light blue) – Internal Higher grade Cu Zones also shown (Orange) – (View Direction : Azim 30, Dip -75 degrees)



**Grid size : 250x250m*

Figure 19 shows the general molybdenum domains defined by geological and mineralogical interpretation.

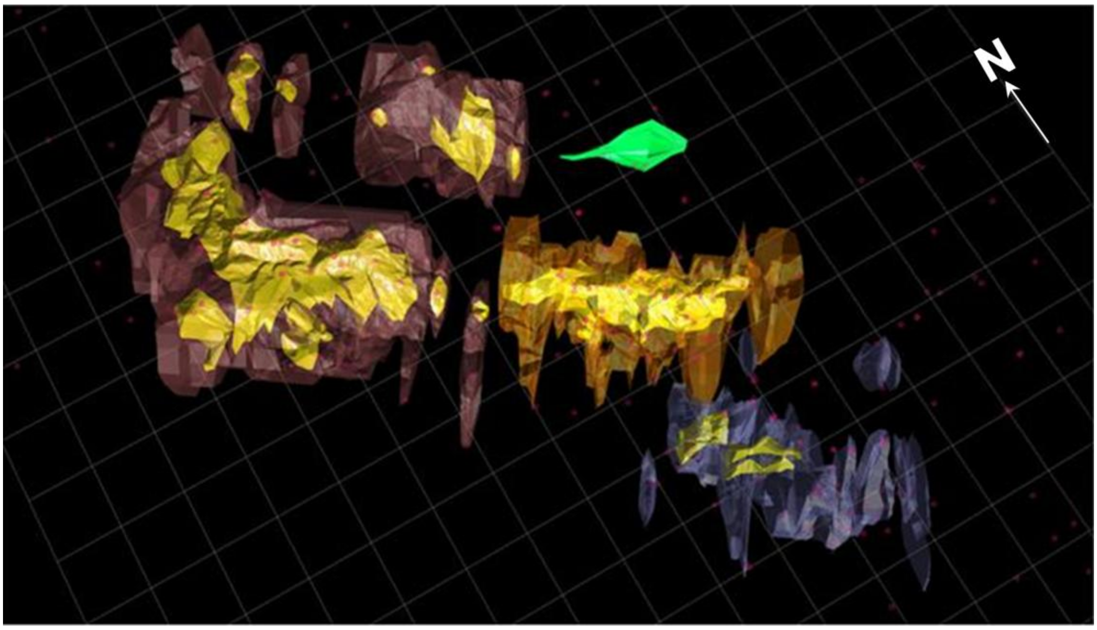
Figure 19 Yandera Mo Mineralisation Domains – Oblique View – Imbruminda Mo Domains envelope (Pink), Gremi Mo Domains envelope (Green) and Omora Mo Domains envelope (Brown) – Internal Higher grade Mo Zones also shown (Blue) – (View Direction : Azim 30, Dip -75 degrees)



**Grid size : 250x250m*

Figure 20 shows the general gold domains defined by geological and mineralogical interpretation.

Figure 20 Yandera Au Mineralisation Domains - Oblique View – Imbruminda Au Domains envelope (Brown), Gremi Au Domains envelope (Orange) and Omora Au Domains envelope (Grey) – Internal Higher grade Au Zones also shown (Yellow) + Dimbi Zone (green) – (View Direction : Azim 30, Dip -75 degrees)



**Grid size : 250x250m*

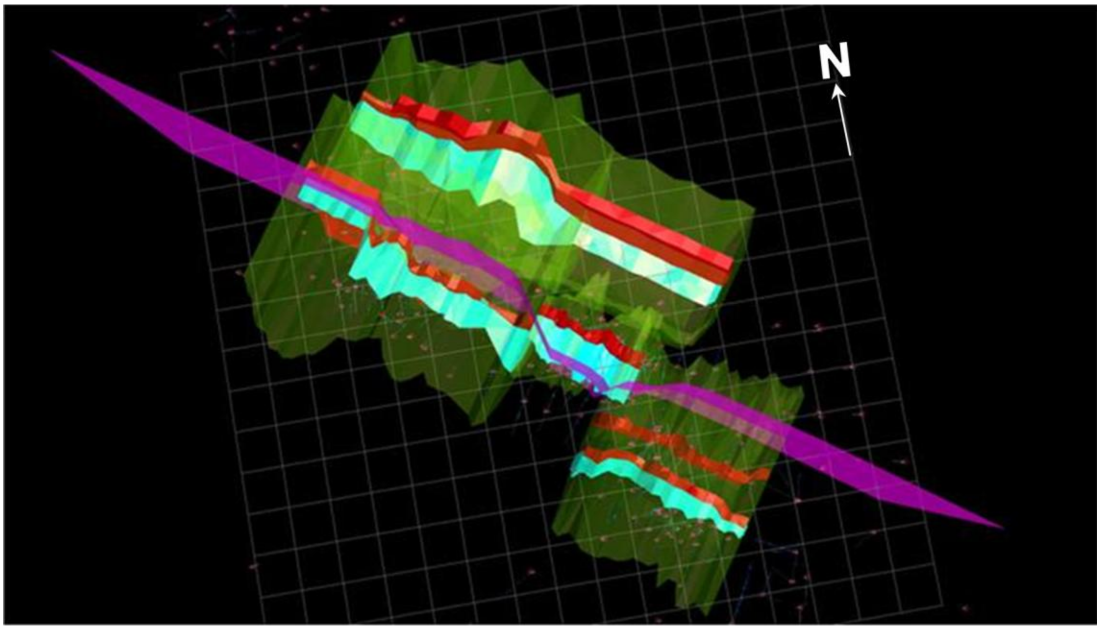
12.2.3 Yandera Alteration Zone Domains Surfaces

A set of alteration coding surfaces developed for the Yandera area were predominantly directed toward separating and defining the main interpreted mineralising phases: specifically the Copper bearing material was observed in close proximity to the prominent shear zones described as 'conduit zones' in this report. Shrouding these conduit zones are a succession of Alteration 'halo's' logged and described as Serecitic, Potassic, Argillic alteration zones.

These various domains were used to help guide the development of the various Cu, Mo and Au mineralisation domain wire-frames.

Figure 21 shows the interpreted alteration domains defined by geological and mineralogical interpretation.

Figure 21 Yandera Alteration Domains – Oblique View – Mineralising 'Conduit' Zones (red), Argillic Alteration Zones (light blue) and Serecitic Alteration Zones (pale green). One of the Major Yandera Fault zones (NW-SE) positions is also shown (pink) – (View Direction : Azim 10, Dip -85 degrees)

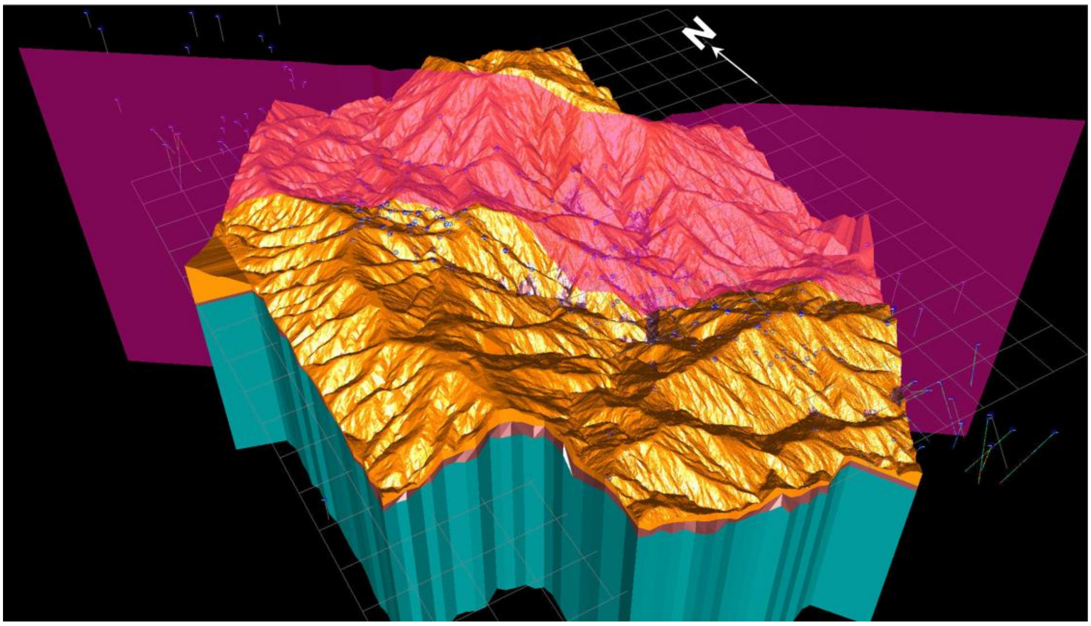


**Grid size : 250x250m*

12.2.4 Weathering/Oxidation State Models – Yandera

Figure 22 shows the general oxide geometry and the interpreted location for the Bereruma Fault line (Pink) at Yandera.

Figure 22 Yandera Lithology 3D solid model wire-frame of Weathering and Oxidation state Domains – orange is Weathered / oxide – Brown is partially weathered – Blue is Unweathered Hypogene / sulphide.

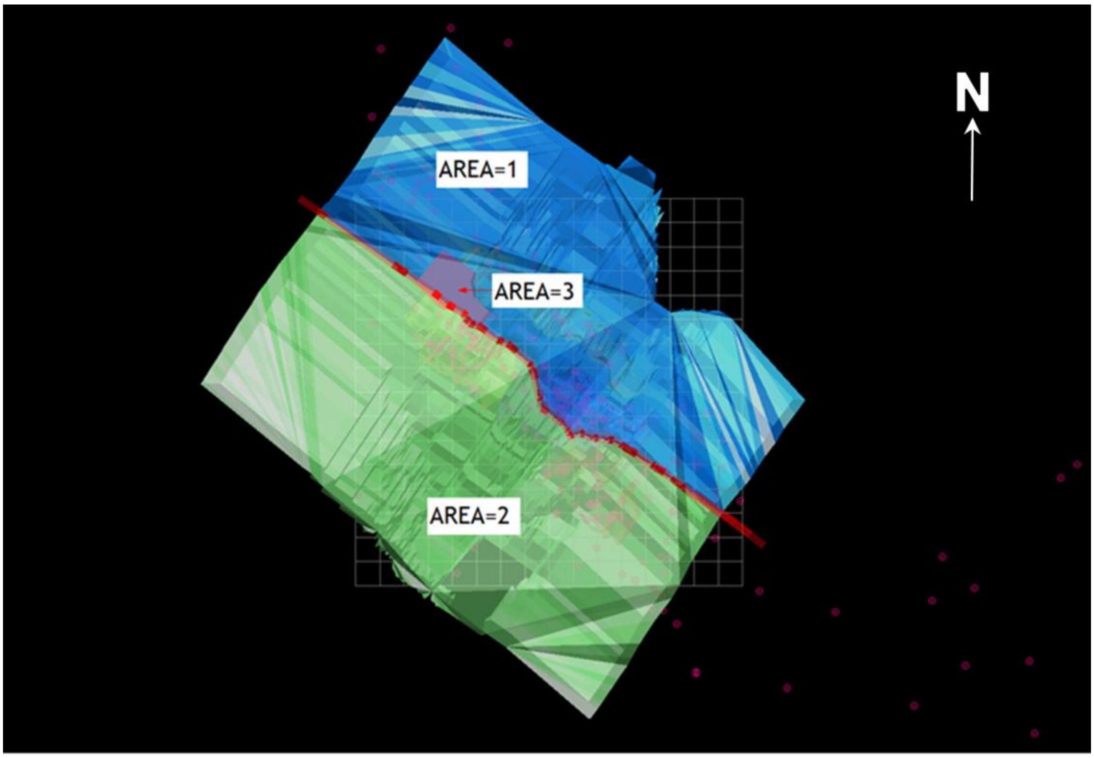


12.2.5 *Mineralisation Orientation Definition Coding*

The main material type Domains are inherently complex in terms of their variable thickness and local orientation. The major strike and dip directions are observed to vary and Ravensgate used a general AREA code definition regime to control search ellipsoid orientations during Ordinary Kriging interpolation.

The following figure (Figure 23) describes the general AREA domain lay-out with respect to the underlying major copper mineralisation domains.

Figure 23 Yandera AREA Domains - Plan View (View Direction: Azim 0, Dip -90 degrees) - (AREA=4 is below AREA=1 & 2 and is material below 'hypogene' surface')



The following Table (Table 14) describes the mineralisation zone AREA domain volume designation and the localised mineralisation zone orientation within each sub-area.

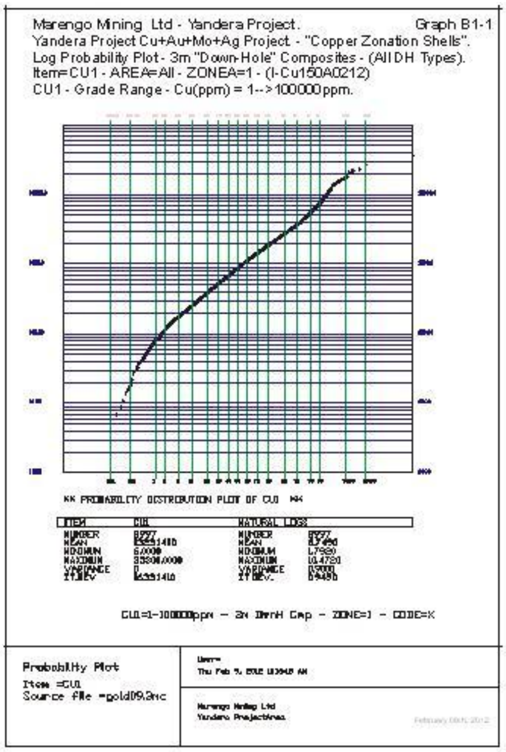
Table 14 List of The Yandera Model Area Estimation Domains and General Orientations

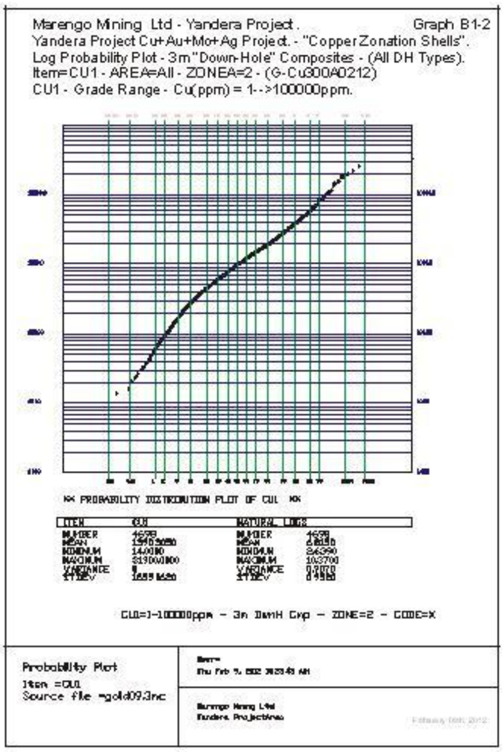
AREA Code (AREA)	Azimuth (approx) (degrees)	Plunge (approx) (degrees)	Dip (E or W) (degrees)
1	300	+10	-88
2	305	-0	-88
3	10	-0	-88
4	305	-0	-88

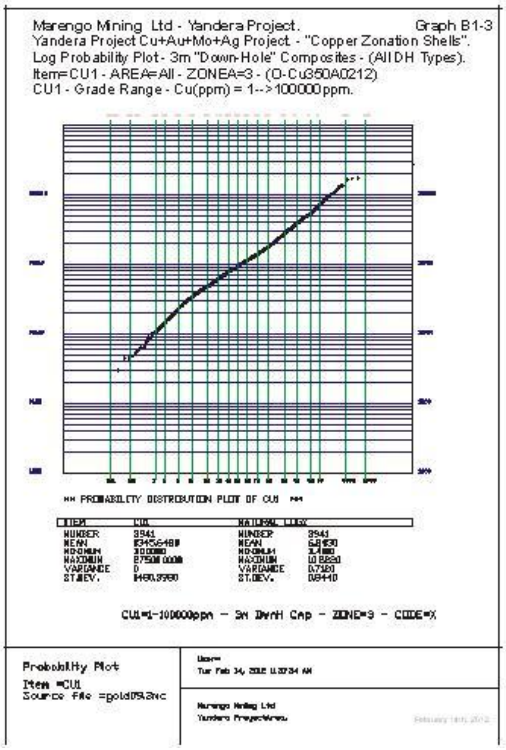
12.2.6 Yandera Area - 3m Down-Hole Composite Statistics

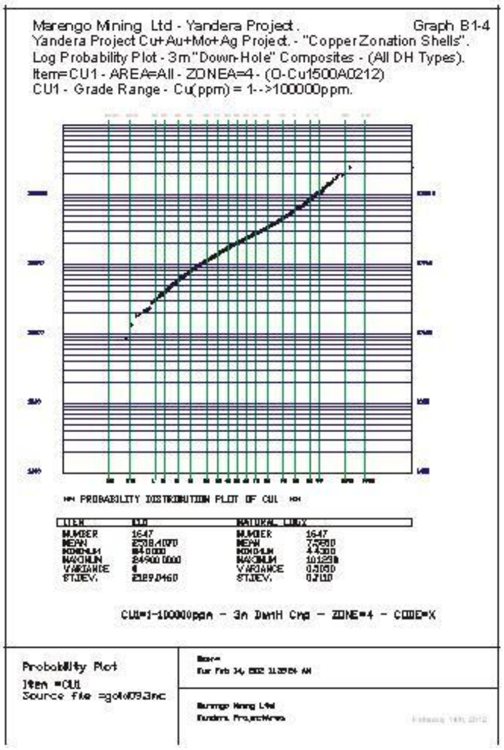
A set of log probability plots were generated and used to describe in detail the constrained composites population distribution within the main Yandera domains. Plots were produced for the main ‘priority’ copper and the ‘ancillary’ molybdenum and gold mineralisation domains (ZONEA=1→7, ZONEB=1→9 and ZONEC=1→10). Typical copper log probability plots using a copper grade range between 0.01 and 100% Cu and are presented in Figure 24. Molybdenum and gold log probability plots are respectively shown in Figure 25 and Figure 26. A full set of Log Probability plots for Cu, Mo, and Au are also presented in Appendix A of this report.

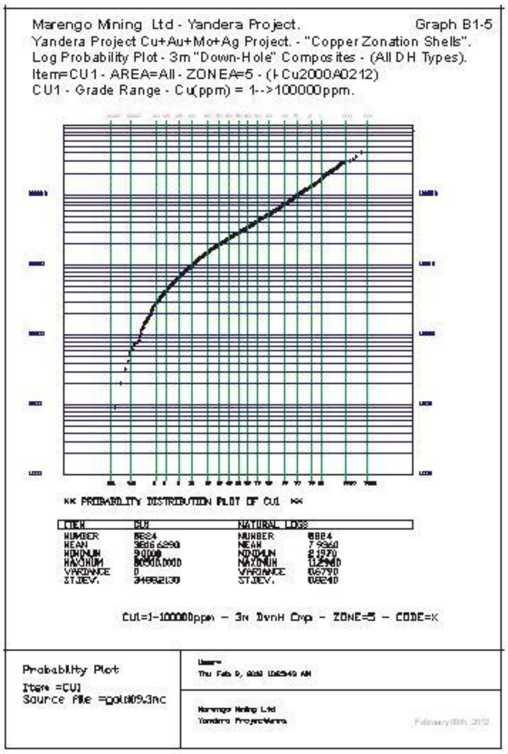
Figure 24 Yandera Deposit - Probability plot of 3m Down-hole Composites – Cu% Item – ZONEA=1 →7 Domains.

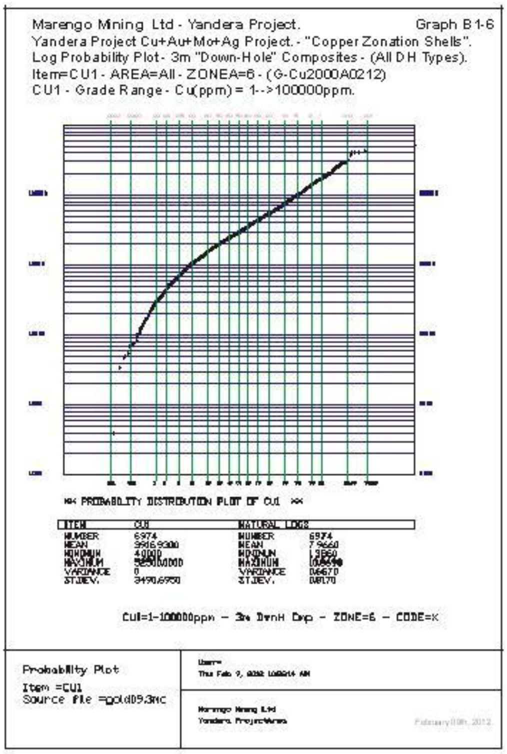









Marengo Mining Ltd - Yandera Project.
Graph B1-5
Yandera Project Cu+Au+Mo+Ag Project. - "Copper Zonation Shells".
Log Probability Plot - 3m "Down-Hole" Composites - (All DH Types).
Item=CU1 - AREA=All - ZONEA=5 - (I-Cu2000A0212)
CU1 - Grade Range - Cu(ppm) = 1-->100000ppm.
** PROBABILITY DISTRIBUTION PLOT OF CU1 **
Probability Plot


Marengo Mining Ltd - Yandera Project.
Graph B1-6
Yandera Project Cu+Au+Mo+Ag Project. - "Copper Zonation Shells".
Log Probability Plot - 3m "Down-Hole" Composites - (All DH Types).
Item=CU1 - AREA=All - ZONEA=6 - (G-Cu2000A0212)
CU1 - Grade Range - Cu(ppm) = 1-->100000ppm.
** PROBABILITY DISTRIBUTION PLOT OF CU1 **
Probability Plot

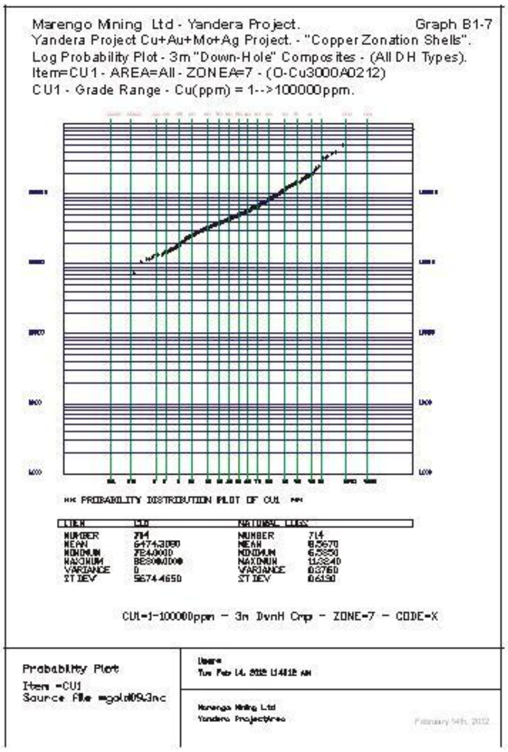
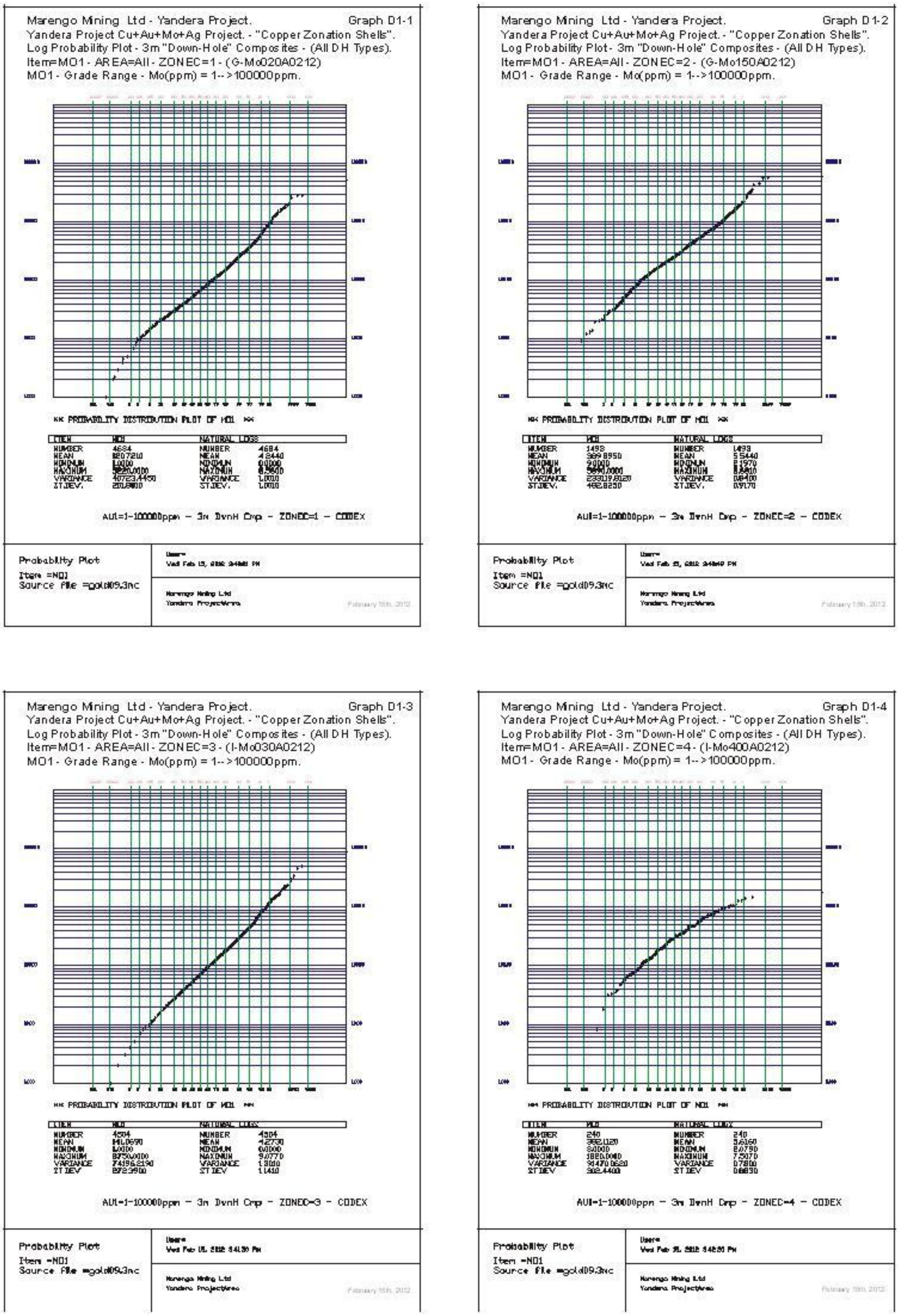
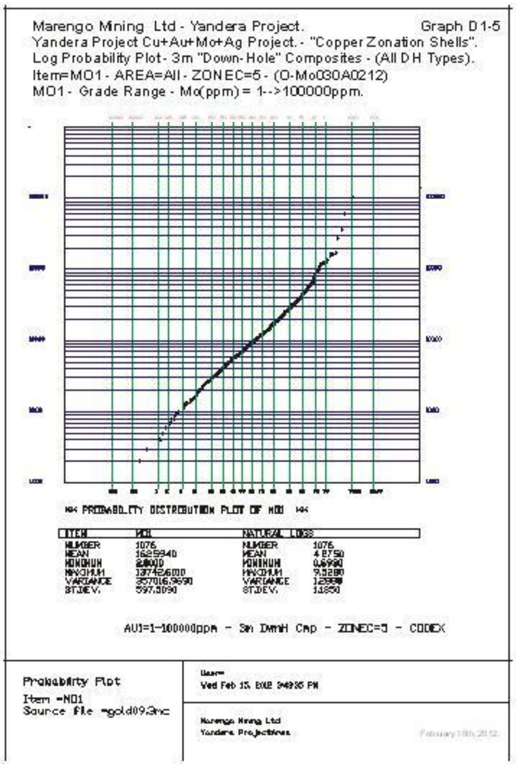

Marengo Mining Ltd - Yandera Project.
Graph B1-7
Yandera Project Cu+Au+Mo+Ag Project. - "Copper Zonation Shells".
Log Probability Plot - 3m "Down-Hole" Composites - (All DH Types).
Item=CU1 - AREA=All - ZONEA=7 - (O-Cu3000A0212)
CU1 - Grade Range - Cu(ppm) = 1-->100000ppm.
** PROBABILITY DISTRIBUTION PLOT OF CU1 **
Probability Plot

Figure 25 Yandera Deposit - Probability plot of 3m Down-hole Composites – Mo% Item – ZONEA=1→7 Domains.




Marengo Mining Ltd - Yandera Project.
Graph D1-5
Yandera Project Cu+Au+Mo+Ag Project. - "Copper Zonation Shells".
Log Probability Plot - 3m "Down-Hole" Composites - (All DH Types).
Item=MO1 - AREA=All - ZONEC=5 - (O-Mo030A0212)
MO1 - Grade Range - Mo(ppm) = 1-->100000ppm.
** PROBABILITY DISTRIBUTION PLOT OF MO1 **
ITEM MO1 NATURAL LOGS
NUMBER 1076 NUMBER 1076
MEAN 162.5940 MEAN 4.8750
MINIMUM 2.0000 MINIMUM 0.6930
MAXIMUM 13742.6000 MAXIMUM 9.5280
VARIANCE 357016.9690 VARIANCE 1.2950
ST.DEV. 597.5090 ST.DEV. 1.1350
AU1=1-100000ppm - 3m DwnH Cmp - ZONEC=5 - CODEX
Probability Plot
Item =MO1
Source file =gold09.3mc
User=
Wed Feb 15, 2012 3:49:35 PM
Marengo Mining Ltd
Yandera ProjectArea

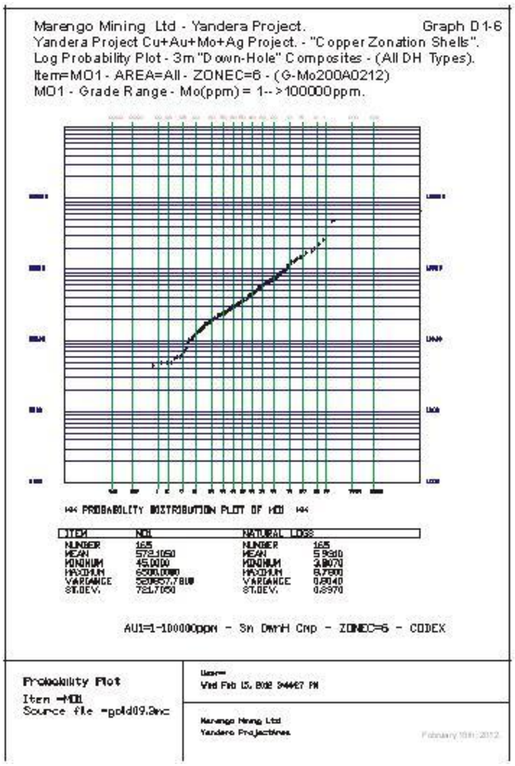
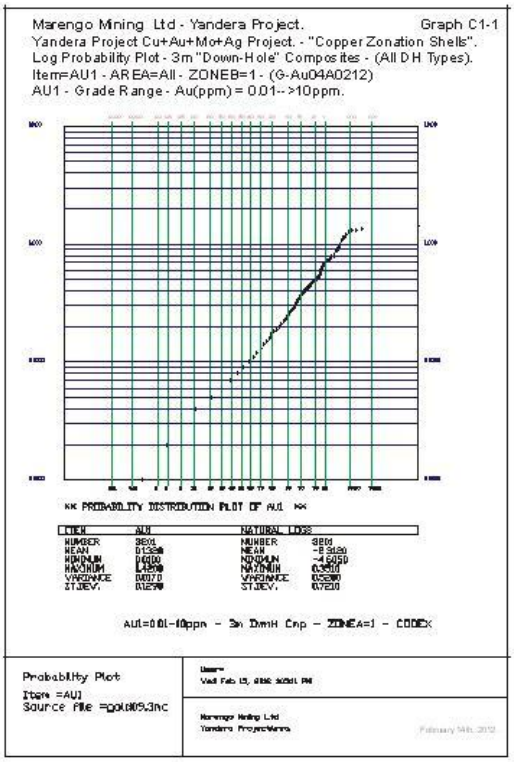
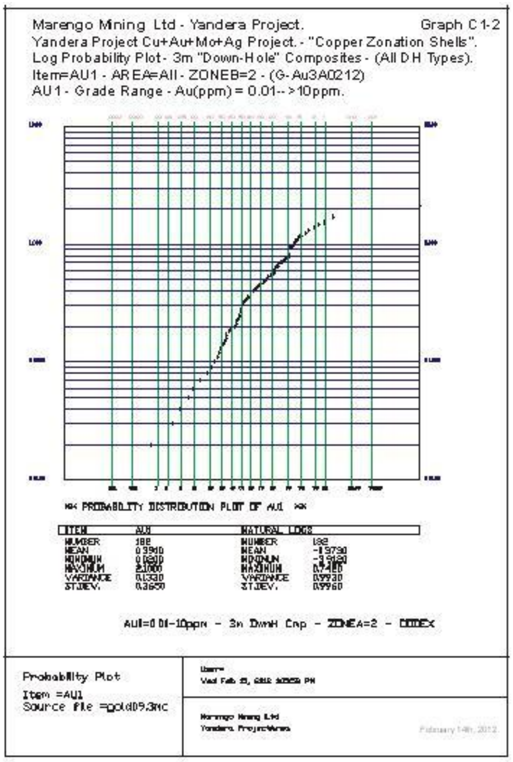
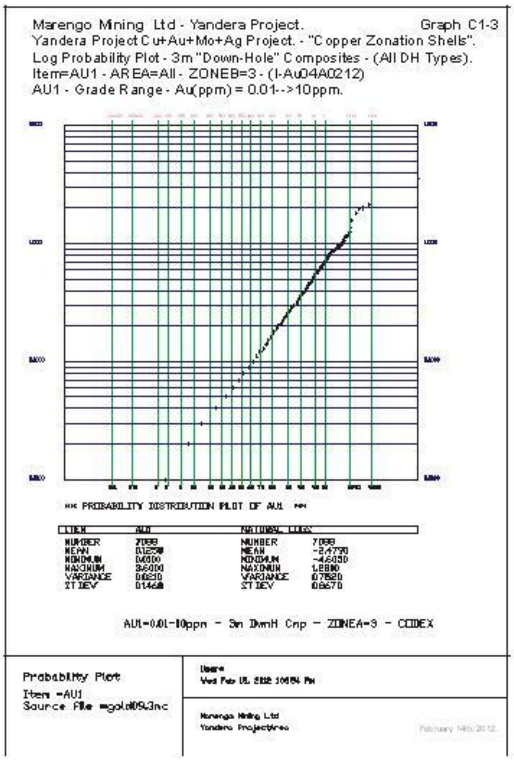
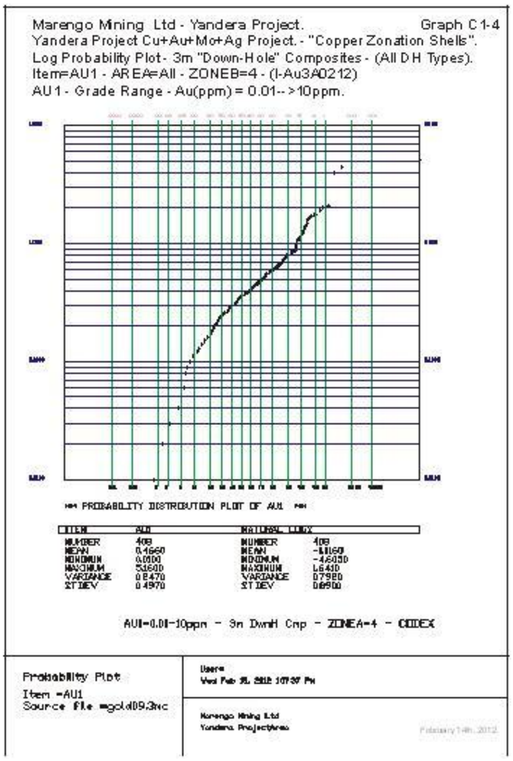

Marengo Mining Ltd - Yandera Project.
Graph D1-6
Yandera Project Cu+Au+Mo+Ag Project. - "Copper Zonation Shells".
Log Probability Plot - 3m "Down-Hole" Composites - (All DH Types).
Item=MO1 - AREA=All - ZONEC=6 - (G-Mo200A0212)
MO1 - Grade Range - Mo(ppm) = 1-->100000ppm.
** PROBABILITY DISTRIBUTION PLOT OF MO1 **
ITEM MO1 NATURAL LOGS
NUMBER 165 NUMBER 165
MEAN 572.1050 MEAN 5.9310
MINIMUM 45.0000 MINIMUM 3.8070
MAXIMUM 6500.0000 MAXIMUM 8.7800
VARIANCE 520857.7810 VARIANCE 0.8040
ST.DEV. 721.7050 ST.DEV. 0.8970
AU1=1-100000ppm - 3m DwnH Cmp - ZONEC=6 - CODEX
Probability Plot
Item =MO1
Source file =gold09.3mc
User=
Wed Feb 15, 2012 3:44:27 PM
Marengo Mining Ltd
Yandera ProjectArea

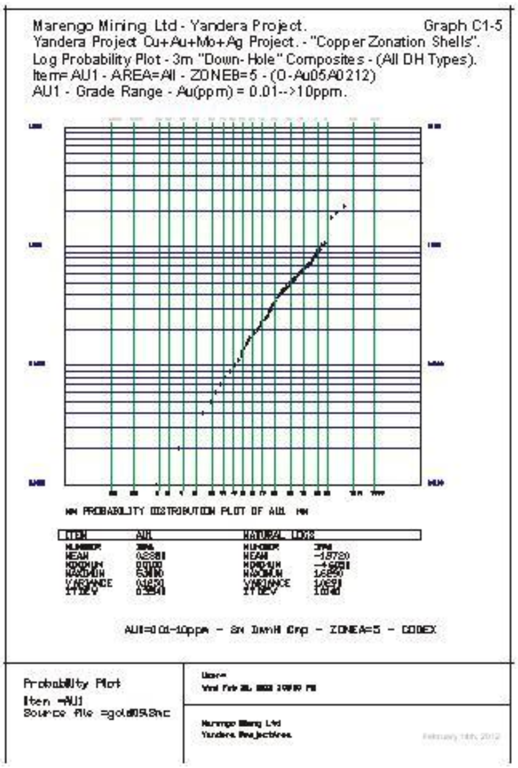
Figure 26 Yandera Deposit – Probability plot of 3m Down-hole Composites – Au ppm Item – ZONEA=1 →7 Domains.

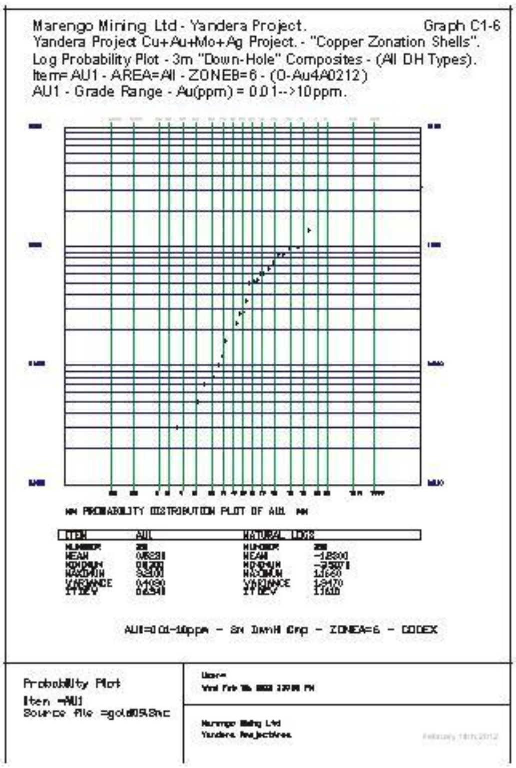












The distribution of copper, molybdenum and gold assays composited within the defined domains at Yandera were also tabulated and reviewed to analyse the statistical distribution according to various cut-off grades. Table 15 to Table 17 below respectively describes the univariate copper, molybdenum and gold item statistics for 3m down-hole composites generated from the available composite data inside the main mineralised mineralisation zone domains for Yandera. These tables are generated from all available composites contained within the respective mineralised domains with all AREA domains combined.

In general, the statistical distribution of copper is observed to be relatively predictable and displays relatively low coefficients of variation (CV ~0.2-1.2). From a kriging point of view it is also observed that these mineralisation domains can have outlier high grade composites within them. Therefore, for the Kriging interpolation runs carried out by Ravensgate for this 2012 resource block model up-date, a variable grade / cut-off distance restriction regime calibrated by probability statistics analysis for each AREA domain was used. Essentially composite grades above a selected level were not permitted to have any interpolation influence throughout the full search ellipsoid ranges depending on the underlying 3-D sample distribution or density.

Table 15 Copper 3m Composite Distribution for Yandera Copper Mineralised Domains Constrained within 3-D shell Domains solids

Yandera – 3m down-hole composite Grade Distribution – Cu(%) (>0.01% Cu).
ZONEA = 1→7 - Zones - All AREA Domains (AREA=All).

Cut-off (Cu %)	Comps (n)	% Intervals above Cut-off	Mean Cu (%)	Standard Deviation	Coefficient of Variation
0.01	34954	100.0000	0.2496	0.3034	1.2155
0.10	23729	67.8864	0.3429	0.3290	0.9595
0.20	14727	42.1325	0.4665	0.3655	0.7835
0.30	9418	26.9440	0.5937	0.4044	0.6812
0.40	6231	17.8263	0.7229	0.4443	0.6146
0.50	4283	12.2532	0.8506	0.4844	0.5695
0.60	2977	8.5169	0.9869	0.5258	0.5328
0.70	2145	6.1366	1.1206	0.5652	0.5044
0.80	1584	4.5317	1.2546	0.6030	0.4806
0.90	1215	3.4760	1.3796	0.6377	0.4622
1.00	939	2.6864	1.5084	0.6731	0.4462
1.10	748	2.1400	1.6283	0.7057	0.4334
1.20	600	1.7165	1.7481	0.7403	0.4235
1.30	484	1.3847	1.8696	0.7766	0.4154
1.40	382	1.0929	2.0099	0.8189	0.4074
1.50	308	0.8812	2.1448	0.8590	0.4005
1.60	256	0.7324	2.2677	0.8935	0.3940
1.70	209	0.5979	2.4080	0.9332	0.3875
1.80	169	0.4835	2.5666	0.9726	0.3789
1.90	144	0.4120	2.6930	1.0011	0.3717
2.00	123	0.3519	2.8202	1.0309	0.3655
2.10	101	0.2890	2.9904	1.0644	0.3559
2.20	91	0.2603	3.0822	1.0829	0.3513
2.30	81	0.2317	3.1859	1.1045	0.3467
2.40	69	0.1974	3.3317	1.1356	0.3408
2.50	61	0.1745	3.4489	1.1580	0.3358
2.60	52	0.1488	3.6073	1.1850	0.3285
2.70	49	0.1402	3.6651	1.1970	0.3266
2.80	43	0.1230	3.7928	1.2251	0.3230
2.90	37	0.1059	3.9481	1.2543	0.3177
3.00	31	0.0887	4.1442	1.2817	0.3093
4.00	13	0.0372	5.1915	1.3916	0.2681

Table 15 Copper 3m Composite Distribution for Yandera Copper Mineralised Domains Constrained within 3-D shell Domains solids Yandera – 3m down-hole composite Grade Distribution – Cu(%) (>0.01% Cu). ZONEA = 1→7 - Zones - All AREA Domains (AREA=All).					
Cut-off (Cu %)	Comps (n)	% Intervals above Cut-off	Mean Cu (%)	Standard Deviation	Coefficient of Variation
5.00	5	0.0143	6.4100	1.6070	0.2507
6.00	2	0.0057	8.1650	0.1626	0.0199
8.00	2	0.0057	8.1650	0.1626	0.0199

Table 16 Molybdenum 3m Composite Distribution for Yandera Molybdenum Mineralised Domains Constrained within 3-D shell Domains solids Yandera - 3m down-hole composite Grade Distribution - Mo(ppm) (>1ppm Mo). ZONEB = 1→9 - Zones - All AREA Domains (AREA=All).					
Cut-off (Mo ppm)	Comps (n)	% Intervals above Cut-off	Mean Mo (ppm)	Standard Deviation	Coefficient of Variation
1	27737	100.0000	103.0499	247.1690	2.3985
50	11486	41.4104	221.7684	351.0587	1.5830
100	6898	24.8693	322.2748	424.0225	1.3157
150	4678	16.8656	417.4299	486.7257	1.1660
200	3434	12.3806	506.1812	541.3328	1.0694
250	2656	9.5757	589.3282	590.1918	1.0015
300	2079	7.4954	677.1038	639.9270	0.9451
350	1671	6.0244	763.5618	686.5767	0.8992
400	1384	4.9897	844.7570	728.5307	0.8624
450	1167	4.2074	923.3158	768.1792	0.8320
500	982	3.5404	1008.2109	809.8320	0.8032
550	857	3.0897	1079.1031	843.8253	0.7820
600	745	2.6859	1154.9541	880.4057	0.7623
650	647	2.3326	1235.6213	918.2170	0.7431
700	564	2.0334	1318.1445	956.1455	0.7254
750	498	1.7954	1397.0253	991.1179	0.7094
800	438	1.5791	1482.1818	1028.0212	0.6936
850	396	1.4277	1552.0688	1057.4080	0.6813
900	346	1.2474	1650.5221	1096.8738	0.6646
950	316	1.1393	1719.6487	1123.5702	0.6534
1000	283	1.0203	1806.3372	1156.6761	0.6403

Table 16 Molybdenum 3m Composite Distribution for Yandera Molybdenum Mineralised Domains Constrained within 3-D shell Domains solids

Yandera – 3m down-hole composite Grade Distribution – Mo(ppm) (>1ppm Mo).
ZONEB = 1→9 - Zones - All AREA Domains (AREA=All).

Cut-off (Mo ppm)	Comps (n)	% Intervals above Cut-off	Mean Mo (ppm)	Standard Deviation	Coefficient of Variation
1500	123	0.4435	2572.2405	1420.5876	0.5523
1600	107	0.3858	2727.5288	1461.2958	0.5358
1700	88	0.3173	2963.0181	1511.8346	0.5102
1800	75	0.2704	3174.8745	1542.4537	0.4858
1900	68	0.2452	3310.2292	1558.3229	0.4708
2000	58	0.2091	3544.5791	1572.9846	0.4438
2100	55	0.1983	3626.6472	1574.5067	0.4341
2200	51	0.1839	3742.4626	1577.7203	0.4216
2300	47	0.1694	3870.3955	1578.7318	0.4079
2400	43	0.1550	4014.6184	1574.6429	0.3922
2500	42	0.1514	4051.6333	1574.6827	0.3887
3000	26	0.0937	4869.5190	1493.2515	0.3067
3500	19	0.0685	5461.4473	1309.7683	0.2398
4000	17	0.0613	5661.6177	1233.8120	0.2179

Table 17 Gold 3m Composite Distribution for Yandera Gold Mineralised Domains Constrained within 3-D shell Domains solids

Yandera – 3m down-hole composite Grade Distribution – Au(ppm) (>0.01ppm Au).
ZONEB = 1→9 - Zones - All AREA Domains (AREA=All).

Cut-off (Au ppm)	Comps (n)	% Intervals above Cut-off	Mean Au (ppm)	Standard Deviation	Coefficient of Variation
0.01	26289	100.0000	0.0915	0.1609	1.7585
0.02	23417	89.0753	0.1015	0.1678	1.6532
0.04	16291	61.9689	0.1354	0.1915	1.4143
0.06	11392	43.3337	0.1746	0.2176	1.2463
0.08	8582	32.6448	0.2106	0.2400	1.1396
0.10	6770	25.7522	0.2444	0.2600	1.0638
0.12	5348	20.3431	0.2817	0.2810	0.9975
0.14	4459	16.9615	0.3130	0.2980	0.9521
0.16	3738	14.2189	0.3454	0.3153	0.9129
0.18	3250	12.3626	0.3725	0.3298	0.8854

Table 17 Gold 3m Composite Distribution for Yandera Gold Mineralised Domains Constrained within 3-D shell Domains solids

Yandera – 3m down-hole composite Grade Distribution – Au(ppm) (>0.01ppm Au). ZONEB = 1→9 - Zones - All AREA Domains (AREA=All).

Cut-off (Au ppm)	Comps (n)	% Intervals above Cut-off	Mean Au (ppm)	Standard Deviation	Coefficient of Variation
0.20	2775	10.5557	0.4046	0.3468	0.8571
0.22	2383	9.0646	0.4376	0.3638	0.8314
0.24	2087	7.9387	0.4678	0.3792	0.8106
0.26	1822	6.9307	0.5002	0.3956	0.7909
0.28	1637	6.2269	0.5268	0.4089	0.7762
0.30	1465	5.5727	0.5552	0.4233	0.7624
0.32	1308	4.9755	0.5853	0.4384	0.7490
0.34	1193	4.5380	0.6103	0.4513	0.7395
0.36	1074	4.0854	0.6397	0.4664	0.7291
0.38	983	3.7392	0.6651	0.4797	0.7212
0.40	906	3.4463	0.6890	0.4923	0.7145
0.42	797	3.0317	0.7279	0.5128	0.7045
0.44	725	2.7578	0.7580	0.5283	0.6970
0.46	663	2.5220	0.7871	0.5434	0.6904
0.48	611	2.3242	0.8146	0.5575	0.6844
0.50	549	2.0883	0.8517	0.5765	0.6769
0.60	378	1.4379	0.9927	0.6471	0.6519
0.70	260	0.9890	1.1527	0.7258	0.6297
0.80	182	0.6923	1.3303	0.8047	0.6049
0.90	130	0.4945	1.5248	0.8803	0.5773
1.00	104	0.3956	1.6700	0.9294	0.5565
1.20	67	0.2549	1.9912	1.0255	0.5150
1.50	41	0.1560	2.4129	1.1230	0.4654
1.60	37	0.1407	2.5035	1.1466	0.4580
1.80	26	0.0989	2.8462	1.2169	0.4276

12.3 Composite Decluster Analysis

Ravensgate reviewed the localised composite statistics based on a cell size of 20.0m easting, 20.0m northing and 20.0m elevation. This larger cell size may be considered in future as a possible maximum anticipated SMU block size. This analysis is used to help determine the localised effects of variable sample density as it may affect reported resources because of variable mineralisation and spatial distribution. The details of the observed variation can be seen in Table 18 that follows.

A de-clustered analysis of the composite data was also completed to assess the impact of any spatial sampling bias, particularly as some areas of the model have closer spaced drilling than other parts. These results are presented in Table 18 through Table 24 below. As a general summary, the declustered domain statistics show similar populations to the declustered data suggesting that there is no significant data bias related to differing spatial coverage of drilling.

It is clear from a review of the localised data that the coefficient of variation is low to moderate for most areas. This is most likely a clear indication that the domaining of mineralisation with respect to locally captured composites has been conducted rigorously and tends to indicate that similarly related composite populations are present.

The spatial distribution of copper composites was observed to be locally slightly variable in some places possibly due to the effect of a somewhat irregular drilling pattern. In the opinion of Ravensgate there were no major concerns identified when considering the relatively small numbers of unevenly distributed sample clusters in the localised areas, thus the use of a distribution adjustment technique such as block 'discretisation averaging' is probably not required for block model interpolation.

Note : Using block discretisation in Ordinary Kriging for example allows for the estimation error to include effects related to the block cell size, ie, estimation variance = 2 * average V(h) between samples & block minus V(h) within model cell minus V(h) between samples (where V(h) is from the global variogram). Basically estimation variance increases as sample distance to block increases. It also generally decreases as block size increases.

Table 18 Marengo - Yandera Area -De-Cluster Analysis of 3m 'down-hole' composites (Lower Cut-Off 0.01% Cu). - (Domain / Zone Constrained)

Yandera Copper Domain ZONEA=1	Composites (Original)		Composites (Declustered)	
	CU1(%) - (Raw)		CU1(%) - Cell=20x20x20m	
AREA=1→4	**n**	10626	**n**	2260
	mean	0.1329	**mean**	0.1332
	Std Dev	0.1624	**Std Dev**	0.1208
	CV	1.222	**CV**	0.907
	Skewness	6.144	**Skewness**	4.523
	Kurtosis	70.202	**Kurtosis**	37.234
No. of cells with 1 comp =	**288**			
No. of cells with 2 comps =	**296**			
No. of cells with 3 comps =	**257**			
No. of cells with 4 comps =	**217**			
No. of cells with 5 comps =	**192**			
No. of cells with >5 comps =	**1010**			

Table 19 Marengo – Yandera Area -De-Cluster Analysis of 3m 'down-hole' composites (Lower Cut-Off 0.01% Cu). – (Domain / Zone Constrained)				
Yandera Copper Domain ZONEA=2	**Composites (Original)**		**Composites (Declustered)**	
	CU1(%) - (Raw)		**CU1(%) - Cell=20x20x20m**	
AREA=1→4	**n**	4651	**n**	1062
	mean	0.1363	**mean**	0.1320
	Std Dev	0.1614	**Std Dev**	0.0982
	CV	1.184	**CV**	0.744
	Skewness	6.202	**Skewness**	3.685
	Kurtosis	68.943	**Kurtosis**	28.319
No. of cells with 1 comp =	**148**			
No. of cells with 2 comps =	**170**			
No. of cells with 3 comps =	**138**			
No. of cells with 4 comps =	**134**			
No. of cells with 5 comps =	**102**			
No. of cells with >5 comps =	**370**			

Table 20 Marengo – Yandera Area -De-Cluster Analysis of 3m 'down-hole' composites (Lower Cut-Off 0.01% Cu). – (Domain / Zone Constrained)				
Yandera Copper Domain ZONEA=3	**Composites (Original)**		**Composites (Declustered)**	
	CU1(%) - (Raw)		**CU1(%) - Cell=20x20x20m**	
AREA=1→4	**n**	3967	**n**	874
	mean	0.1348	**mean**	0.1349
	Std Dev	0.1482	**Std Dev**	0.1208
	CV	1.099	**CV**	0.895
	Skewness	4.910	**Skewness**	5.909
	Kurtosis	45.940	**Kurtosis**	64.185
No. of cells with 1 comp =	**112**			
No. of cells with 2 comps =	**118**			
No. of cells with 3 comps =	**123**			
No. of cells with 4 comps =	**96**			
No. of cells with 5 comps =	**90**			
No. of cells with >5 comps =	**335**			

Table 21 Marengo – Yandera Area -De-Cluster Analysis of 3m 'down-hole' composites (Lower Cut-Off 0.01% Cu). – (Domain / Zone Constrained)				
Yandera Copper Domain ZONEA=4	**Composites (Original)**		**Composites (Declustered)**	
	CU1(%) - (Raw)		**CU1(%) - Cell=20x20x20m**	
AREA=1→4	**n**	1623	**n**	393
	mean	0.2500	**mean**	0.2380
	Std Dev	0.2042	**Std Dev**	0.1198
	CV	0.817	**CV**	0.503
	Skewness	3.514	**Skewness**	1.717
	Kurtosis	21.431	**Kurtosis**	6.352
No. of cells with 1 comp =	**63**			
No. of cells with 2 comps =	**72**			
No. of cells with 3 comps =	**48**			
No. of cells with 4 comps =	**52**			
No. of cells with 5 comps =	**50**			
No. of cells with >5 comps =	**108**			

Table 22 Marengo – Yandera Area -De-Cluster Analysis of 3m 'down-hole' composites (Lower Cut-Off 0.01% Cu). – (Domain / Zone Constrained)				
Yandera Copper Domain ZONEA=5	**Composites (Original)**		**Composites (Declustered)**	
	CU1(%) - (Raw)		**CU1(%) - Cell=20x20x20m**	
AREA=1→4	**n**	6307	**n**	1307
	mean	0.3982	**mean**	0.3911
	Std Dev	0.3809	**Std Dev**	0.2673
	CV	0.956	**CV**	0.684
	Skewness	4.793	**Skewness**	2.853
	Kurtosis	50.092	**Kurtosis**	14.944
No. of cells with 1 comp =	**177**			
No. of cells with 2 comps =	**157**			
No. of cells with 3 comps =	**136**			
No. of cells with 4 comps =	**127**			
No. of cells with 5 comps =	**117**			
No. of cells with >5 comps =	**593**			

Table 23 Marengo – Yandera Area -De-Cluster Analysis of 3m 'down-hole' composites (Lower Cut-Off 0.01% Cu). – (Domain / Zone Constrained)				
Yandera Copper Domain ZONEA=6	**Composites (Original)**		**Composites (Declustered)**	
	CU1(%) - (Raw)		**CU1(%) - Cell=20x20x20m**	
AREA=1→4	**n**	6977	**n**	1402
	mean	0.3951	**mean**	0.3859
	Std Dev	0.3487	**Std Dev**	0.2469
	CV	0.882	**CV**	0.640
	Skewness	3.344	**Skewness**	2.160
	Kurtosis	21.433	**Kurtosis**	8.063
No. of cells with 1 comp =	**191**			
No. of cells with 2 comps =	**158**			
No. of cells with 3 comps =	**148**			
No. of cells with 4 comps =	**142**			
No. of cells with 5 comps =	**126**			
No. of cells with >5 comps =	**637**			

Table 24 Marengo – Yandera Area -De-Cluster Analysis of 3m 'down-hole' composites (Lower Cut-Off 0.01% Cu). – (Domain / Zone Constrained)				
Yandera Copper Domain ZONEA=7	**Composites (Original)**		**Composites (Declustered)**	
	CU1(%) - (Raw)		**CU1(%) - Cell=20x20x20m**	
AREA=1→4	**n**	713	**n**	165
	mean	0.6586	**mean**	0.6778
	Std Dev	0.5679	**Std Dev**	0.5400
	CV	0.862	**CV**	0.797
	Skewness	5.586	**Skewness**	4.982
	Kurtosis	54.641	**Kurtosis**	32.663
No. of cells with 1 comp =	**28**			
No. of cells with 2 comps =	**24**			
No. of cells with 3 comps =	**23**			
No. of cells with 4 comps =	**23**			
No. of cells with 5 comps =	**14**			
No. of cells with >5 comps =	**53**			

12.4 Domain Variography

The semi-variogram (abbreviated to 'variogram') is a tool to help characterise spatial variability of composite grades. This type of study is best carried out within a known material type or mineralisation domain which has, on average, similar geologic features. For a given element, such as the 3m down-hole copper composites used for the main Yandera mineralisation domains, the variograms were calculated by using the standard method of determining half of the mean of the squared differences between all pairs of composite points separated according to a set of directional vectors. The changing observed variance with respective increasing distance between sample pairs is then plotted to produce the variograms which are then modelled by defining the nugget and sill/range parameters.

The down-hole semi-variogram calculations and modelling were carried out by Ravensgate using MineSight Compass Programs, M303V1 and M300V1, to produce representative variogram models for the major mineralisation domains. The variograms were all calculated and developed using the available domain constrained 3m 'down-hole' composite set. Where possible a set of variograms were generated for each domain to help describe separately the localised spatial relationships of composites primarily for the down-hole direction. Robust 'between-hole' variograms along strike (long axis) and down-dip (semi-major axis) were sometimes not successfully generated: most likely due to a lack of data in smaller domains or the localised internal grade variability in conjunction with the mineralisation domain complexity. The variograms calculated and modelled generally used the MineSight 'Normal' calculation function for copper and molybdenum. For gold, the 'Co-Variogram' was used.

Using the previously described copper mineralisation domains, Ravensgate utilised down-hole variography to help assign interpolation parameters to the Ordinary Kriging Interpolation runs. The semi-variogram plots shown below (see Figure 27 which spans several pages) describe the typical representative down-hole variogram models derived from 3m 'down-hole' composites contained within the main mineralised zone domains. The mineralisation domains were sometimes sub-divided by an AREA domain to investigate local spatial variability. Conversely it was sometimes necessary to group some AREA domains to allow for adequate amounts of composite data to be 'captured' to allow for reliable variogram modelling.

Overall the semi-variogram models can be described as relatively 'strong' for most 'down-hole' variograms modelled for each deposit area. The derived down-hole ranges generally reflect and confirm the approximate average mineralisation zone thicknesses as modelled within wire-frames. Longer range variograms, (between hole) were generally good and those seen to be less 'robust', or not defined, were for domains where the number of composites were too small or the local composites variances were too high..

Subsequent Block Model Interpolation and associated copper grade estimation was carried out using Ordinary Kriging interpolation. Appropriate nugget and sill values based on variogram and geostatistical analysis of mineralised zones sub-divided by a localised mineralisation AREA are directly applied to each domain describing the local mineralisation geometry. Search ellipses used were orientated to reflect the orientation of the main observed orientation of mineralisation zones.

A large set of variograms were generated for each domain for each of the major elements to help describe separately the spatial relationships of composite grades within each domain in directions across strike (short axis), along strike (major axis) and down-dip (semi-major axis). The variograms calculated and modelled generally used the 'Normal' calculation function for copper and molybdenum. The variogram calculation parameters are summarised in Table 25 through Table 27 below.

Table 25 Summary of Typical 'Down-Hole' Variogram Calculation Input Variables						
Element Item	**ZONEA Domain**	**Grade Range**	**Lag / Tolerance**	**Window Angle**	**ZONE**	**Type**
Cu	1→7	0.03-0.4(%)	3(+/-)1m	10	1	'Norm'

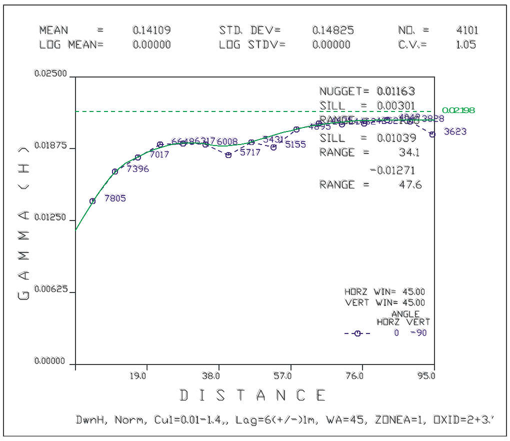
Table 26 Summary of Typical 'Down-Hole' Variogram Calculation Input Variables						
Element Item	**ZONEB Domain**	**Grade Range**	**Lag / Tolerance**	**Window Angle**	**ZONE**	**Type**
Mo	1→9	30-3000(ppm)	3(+/-)1m	10	1	'Norm'

Table 27 Summary of Typical 'Down-Hole' Variogram Calculation Input Variables						
Element Item	**ZONEC Domain**	**Grade Range**	**Lag / Tolerance**	**Window Angle**	**ZONE**	**Type**
Au	1→10	0.02-2.0(ppm)	3(+/-)1m	10	1	'CoVar'

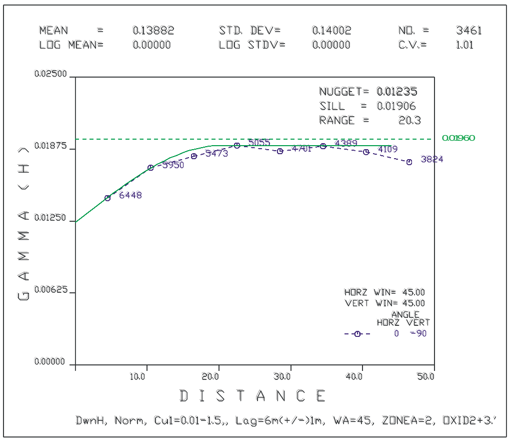
The following graphs (Figure 27 through Figure 30, which span several pages) display the variography for the Cu, Mo and Au mineralisation (ZONE) domains at the Yandera deposit area.

Figure 27 Yandera Area Typical 'Down-Hole' Semi-Variogram Model – Based on 3m 'down-hole' composites for ZONEA=1→7 and AREA domains 1-4 (Graphs A series-copper)

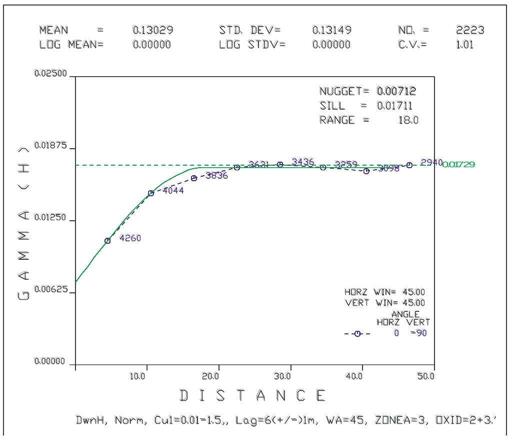
Graph A1-1a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 150ppm - Imbruminda - ZONEA=1
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=1 - OXID=2+3 - AREA=All. - (Feb 18th, 2012).



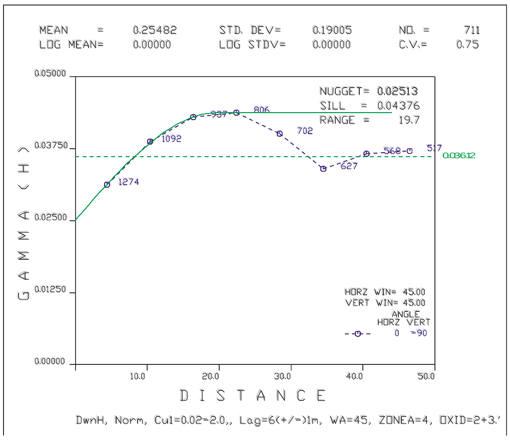
Graph A1-2 - Marengo Mining Ltd - Yandera Project.
Cu Zones - 300ppm - Gremi - ZONEA=2
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=2 - OXID=2+3 - AREA=All. - (Feb 18th, 2012).



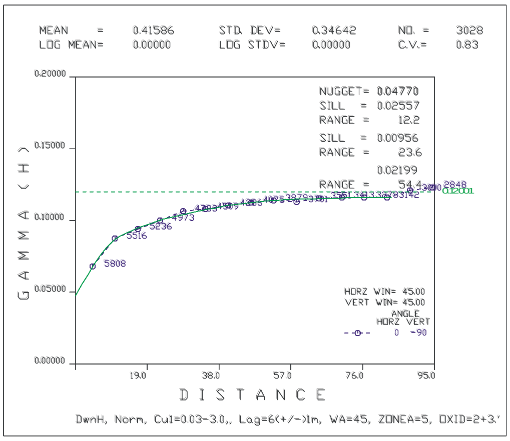
Graph A1-3 - Marengo Mining Ltd - Yandera Project.
Cu Zones - 350ppm - Omora - ZONEA=3
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=3 - OXID=2+3 - AREA=All. - (Feb 18th, 2012).



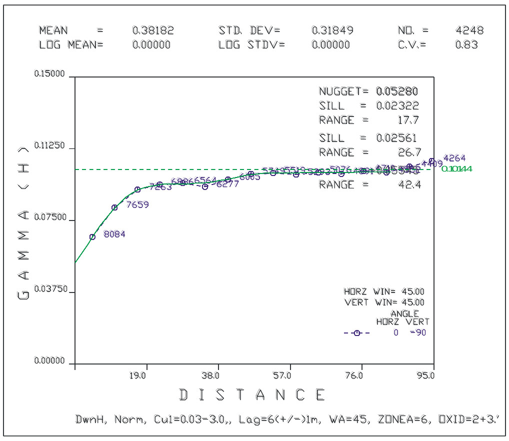
Graph A1-4 - Marengo Mining Ltd - Yandera Project.
Cu Zones - 1500ppm - Omora - ZONEA=4
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=4 - OXID=2+3 - AREA=All. - (Feb 16th, 2012).



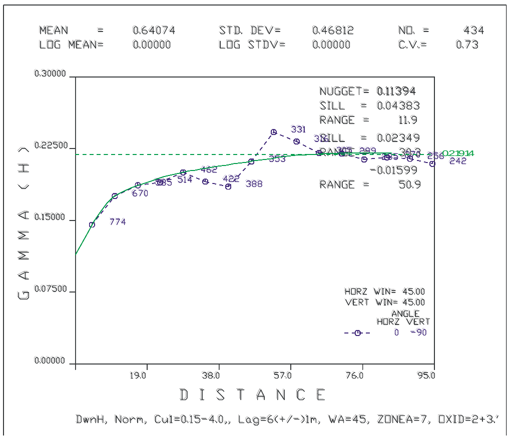
Graph A1-5a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 2000ppm - Imbruminda - ZONEA=5
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=5 - OXID=2+3 - AREA=All. - (Feb 18th, 2012).



Graph A1-6a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 2000ppm - Gremi - ZONEA=6
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=6 - OXID=2+3 - AREA=All. - (Feb 16th, 2012).



Graph A1-7a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 3000ppm - Omora - ZONEA=7
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=7 - OXID=2+3 - AREA=All. - (Feb 16th, 2012).



Graph A1-5b - Marengo Mining Ltd - Yandera Project.
Cu Zones - 2000ppm - Imbruminda - ZONEA=5
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=5 - OXID=2+3 - AREA=All. - (Feb 20th, 2012).

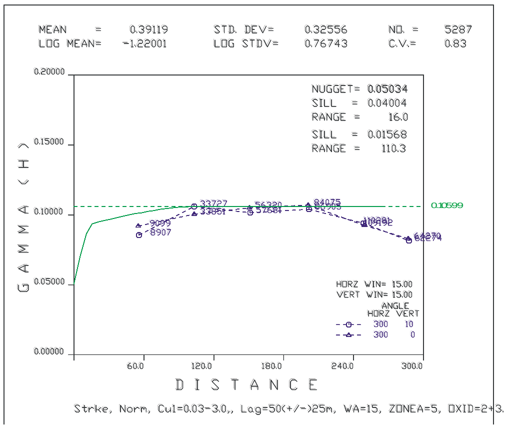
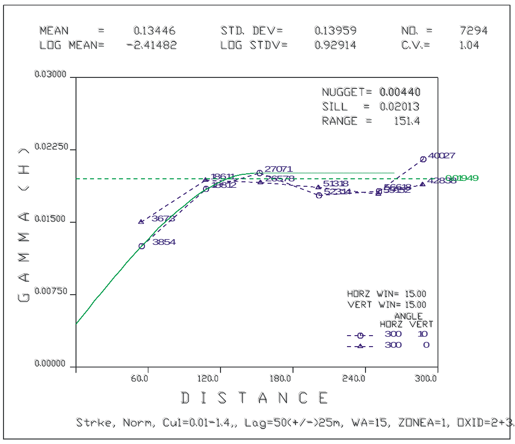
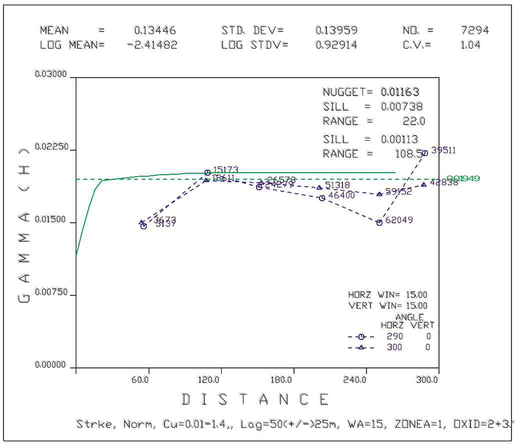


Figure 28 Yandera Area Typical 'Between-Hole' Semi-Variogram Model – Based on 3m 'down-hole' composites for ZONEA=1→7 and AREA domains 1-4 (Graphs A2 series- copper)

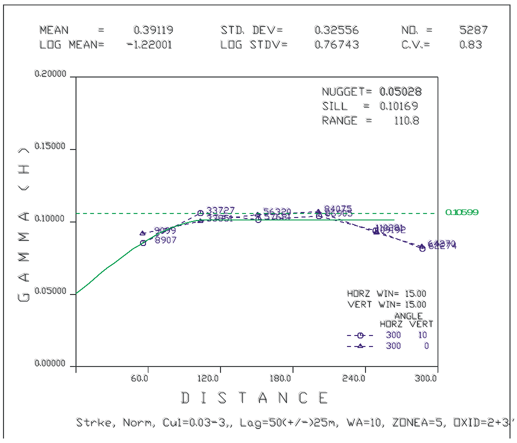
Graph A2-1a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 150ppm - Imbruminda - ZONEA=1
"Strike" Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=1 - OXID=2+3 - AREA=All. - (Feb 20th, 2012).



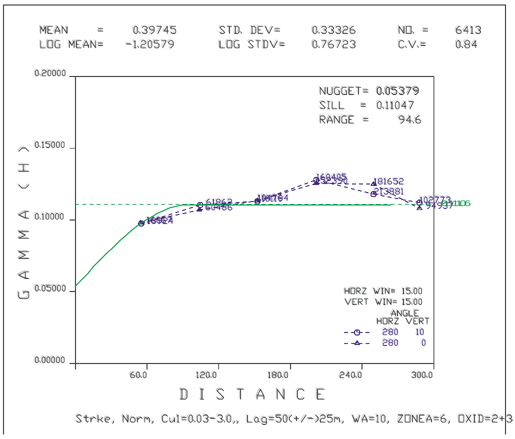
Graph A2-1b - Marengo Mining Ltd - Yandera Project.
Cu Zones - 150ppm - Imbruminda - ZONEA=1
"Strike" Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=1 - OXID=2+3 - AREA=All. - (Feb 20th, 2012).



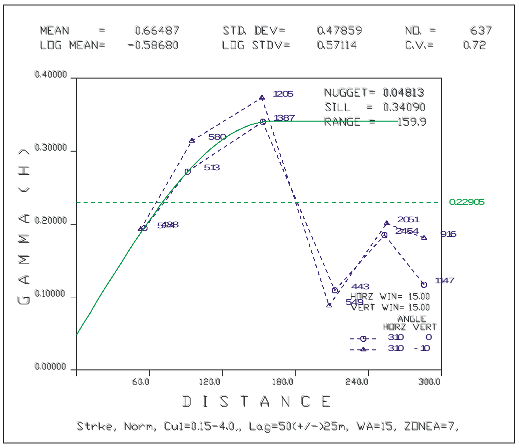
Graph A2-5a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 2000ppm - Imbruminda - ZONEA=5
"Strike" Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=5 - OXID=2+3 - AREA=All. - (Feb 18th, 2012).



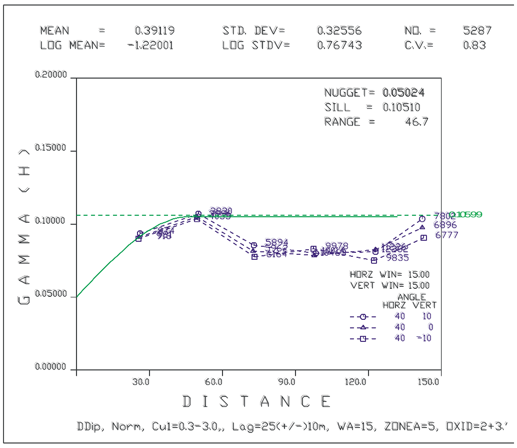
Graph A2-6a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 2000ppm - Gremi - ZONEA=6
"Strike" Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=6 - OXID=2+3 - AREA=All. - (Feb 19th, 2012).



Graph A2-7a - Marengo Mining Ltd - Yandera Project.
Cu Zones - 3000ppm - Omora - ZONEA=7
"Strike" Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=7 - OXID=2+3 - AREA=All. - (Feb 20th, 2012).



Graph A3-5 - Marengo Mining Ltd - Yandera Project.
Cu Zones - 2000ppm - Imbruminda - ZONEA=5
"DDip" Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=5 - OXID=2+3 - AREA=All. - (Feb 18th, 2012).



Graph A3-6 - Marengo Mining Ltd - Yandera Project.
Cu Zones - 2000ppm - Gremi - ZONEA=6
"DDip" Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
CU1PC Item - ZONEA=6 - OXID=2+3 - AREA=All. - (Feb 20th, 2012).

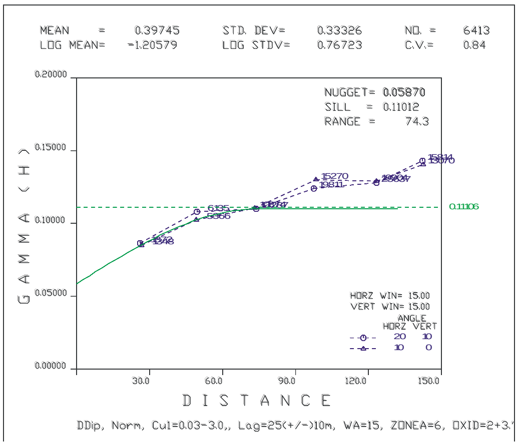
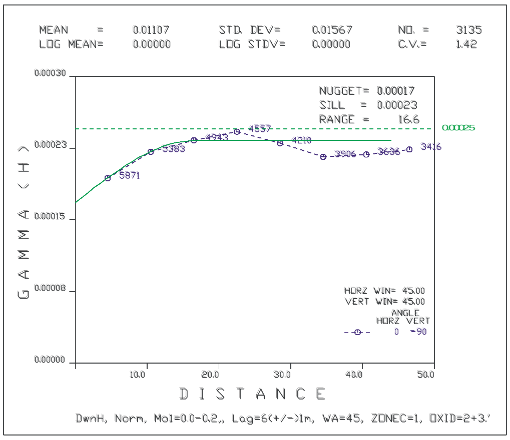
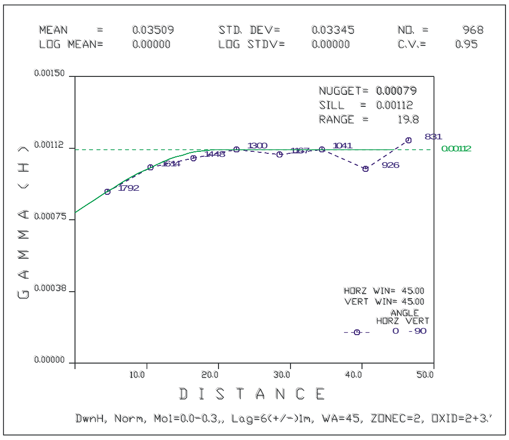


Figure 29 Yandera Area Typical 'Down-Hole' Semi-Variogram Model – Based on 3m 'down-hole' composites for ZONEC=1→9 and AREA domains 1-4 (Graphs B series - molybdenum)

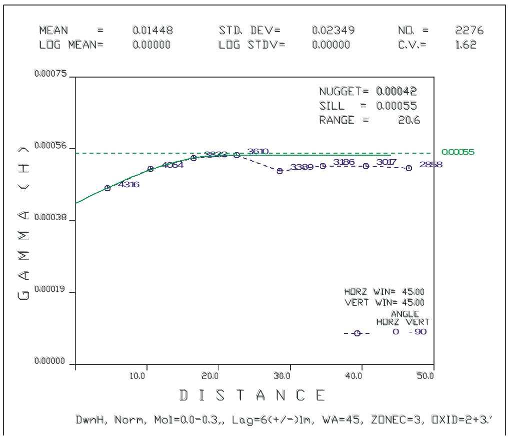
Graph B1-1 - Marengo Mining Ltd - Yandera Project.
Mo Zones - 20ppm - Gremi - ZONEC=1
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
MO1PC Item - ZONEC=1 - OXID=2+3 - AREA=All. (Feb 17th, 2012).



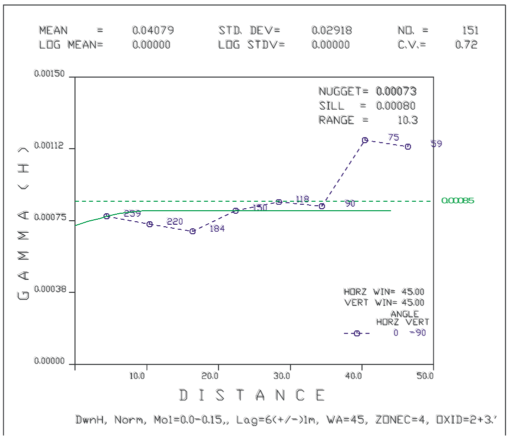
Graph B1-2 - Marengo Mining Ltd - Yandera Project.
Mo Zones -150ppm - Gremi - ZONEC=2
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
MO1PC Item - ZONEC=2 - OXID=2+3 - AREA=All. (Feb 17th, 2012).



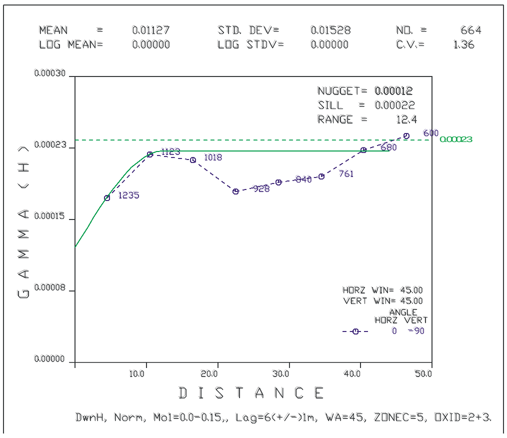
Graph B1-3 - Marengo Mining Ltd - Yandera Project.
Mo Zones - 30ppm - Imbruminda - ZONEC=3
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
MO1PC Item - ZONEC=3 - OXID=2+3 - AREA=All. (Feb 17th, 2012).



Graph B1-4 - Marengo Mining Ltd - Yandera Project.
Mo Zones - 300ppm - Imbruminda - ZONEC=4
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
MO1PC Item - ZONEC=4 - OXID=2+3 - AREA=All. (Feb 17th, 2012).



Graph B1-5 - Marengo Mining Ltd - Yandera Project.
Mo Zones - 30ppm - Omora - ZONEC=5
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
MO1PC Item - ZONEC=5 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).



Graph B1-6 - Marengo Mining Ltd - Yandera Project.
Mo Zones - 200ppm - Omora - ZONEC=6
DownHole Variogram - 'Normal' Variogram - 3m Down-Hole Composites.
MO1PC Item - ZONEC=6 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).

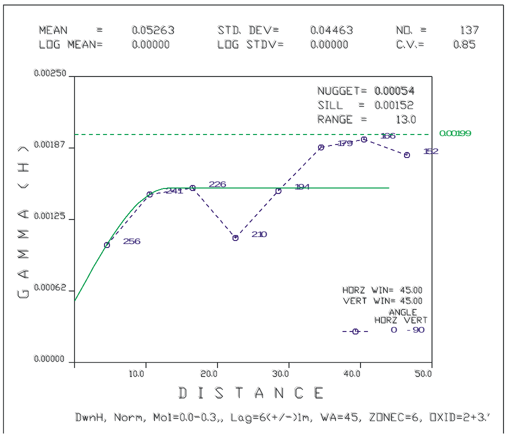
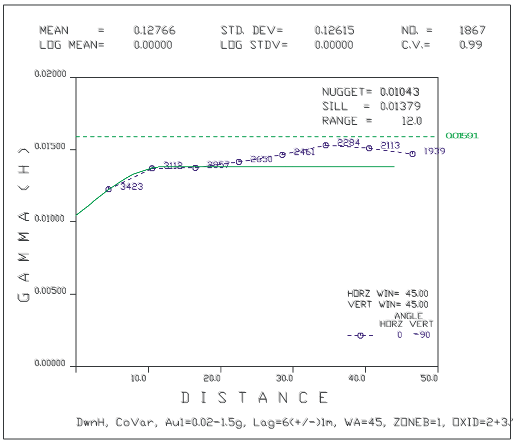
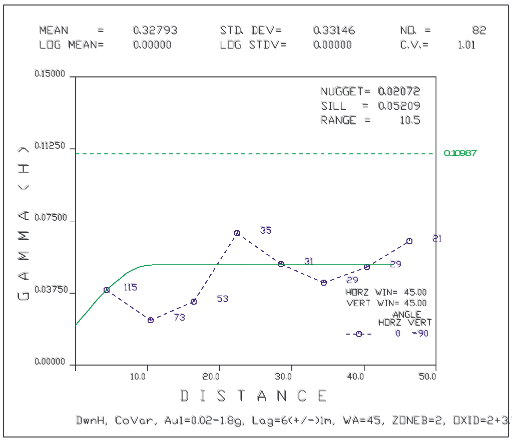


Figure 30 Yandera Area Typical ‘Down-Hole’ Semi-Variogram Model – Based on 3m ‘down-hole’ composites for ZONEB=1→10 and AREA domains 1-4 (Graphs C series - gold)

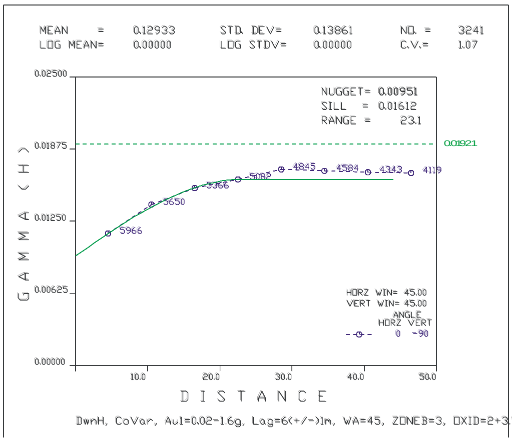
Graph C1-1 - Marengo Mining Ltd - Yandera Project.
Au Zones - 0.04ppm - Gremi - ZONEB=1
DownHole Variogram - ‘CoVar’ Variogram - 3m Down-Hole Composites.
AU1 Item - ZONEB=1 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).



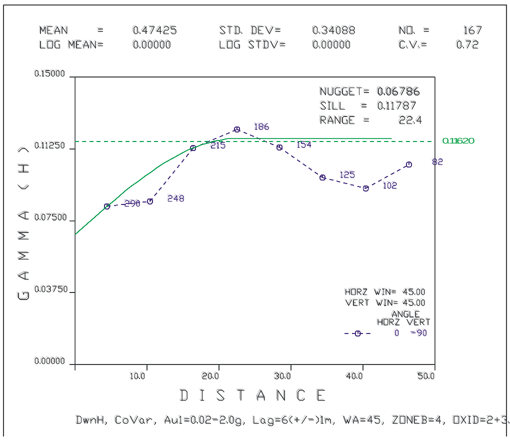
Graph C1-2 - Marengo Mining Ltd - Yandera Project.
Au Zones -3.00ppm - Gremi - ZONEB=2
DownHole Variogram - ‘CoVar’ Variogram - 3m Down-Hole Composites.
AU1 Item - ZONEB=2 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).



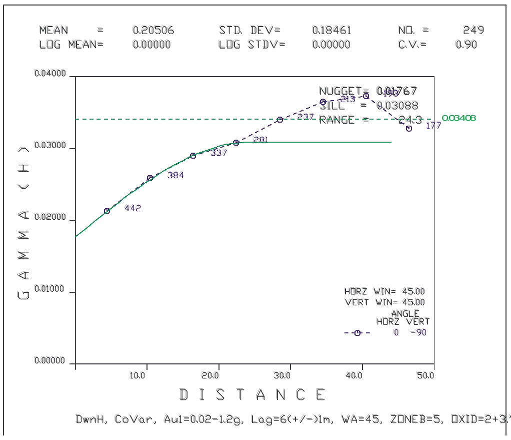
Graph C1-3 - Marengo Mining Ltd - Yandera Project.
Au Zones - 0.04ppm - Imbruminda - ZONEB=3
DownHole Variogram - ‘CoVar’ Variogram - 3m Down-Hole Composites.
AU1 Item - ZONEB=3 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).



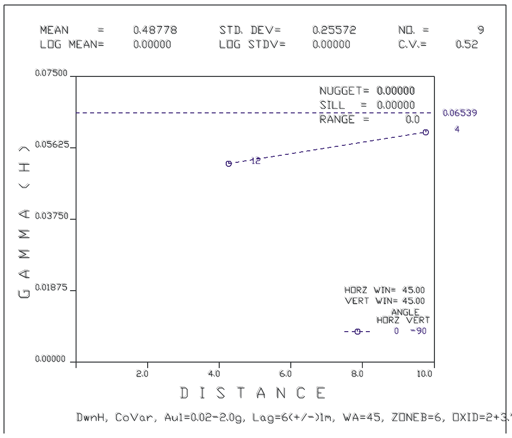
Graph C1-4 - Marengo Mining Ltd - Yandera Project.
Au Zones - 3.00ppm - Imbruminda - ZONEB=4
DownHole Variogram - ‘CoVar’ Variogram - 3m Down-Hole Composites.
AU1 Item - ZONEB=4 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).



Graph C1-5 - Marengo Mining Ltd - Yandera Project.
Au Zones - 0.05ppm - Omora - ZONEB=5
DownHole Variogram - 'CoVar' Variogram - 3m Down-Hole Composites.
AU1 Item - ZONEB=5 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).



Graph C1-6 - Marengo Mining Ltd - Yandera Project.
Au Zones - 4.00ppm - Omora - ZONEB=6
DownHole Variogram - 'CoVar' Variogram - 3m Down-Hole Composites.
AU1 Item - ZONEB=6 - OXID=2+3 - AREA=All. - (Feb 17th, 2012).



12.5 Adequacy of Data for Resource Modelling

It is the opinion of Ravensgate that the drilling, geological logging and analytical assay data acquired from the Yandera Project area up to and until the new data cut-off date of 10 February 2012, is a representative data-set that substantially confirms the presence of a large mineralised system containing significant quantities of copper, molybdenum and gold. Ravensgate considers that the available data is adequate for the purpose of resource estimation. It should be stressed that the mineralised systems are inherently complex, and that often drilling is not necessarily uniform or complete and some variation of future reported mineral resources from this reported mineral resource can be expected as further drilling and resource development work is continued at Yandera. The drilling programs have been well planned and carried out given the difficult terrain at Yandera. The recorded drilling and sampling procedures are adequate for the style of mineralisation observed and encountered. Assaying and associated QA/QC protocols have been used systematically and it is Ravensgate's understanding that no serious data quality and related information storage or custody issues have been identified. It is also understood that ongoing continued review of the sample collection and assay methodologies will be continually monitored and assays cross checked with other laboratories to ensure a reliable drilling database is maintained.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Introduction

Metallurgical testwork on mineralised samples from the Yandera deposits has been undertaken over three broad programmes as follows:

AMEC-Minproc	Comprehensive comminution characterisation and preliminary flotation and magnetic separation testwork undertaken at ALS-Ammtec in Perth, WA under the direction of AMEC-Minproc. Comminution characterisation testwork results are summarised in Section 13.3 and metallurgical work summarised in Section 13.4.
NFC/Nerin	Comprehensive mineralogical assessment, flotation and magnetic separation testwork undertaken at the Beijing General Research Institute of Metallurgy and Mining (BGRIMM) laboratory under the direction of China Nonferrous Metal Industry's Foreign Engineering and Construction Co. Ltd. (NFC) and others. This programme is substantially complete and the results are summarised in Section 13.5.
AMS/Marengo	Parallel testing with the NFC programme undertaken at ALS-Ammtec in Perth, WA and supervised by Arccon Mining Services (AMS) and Marengo. This programme is currently underway and available results are presented in Section 13.6.

The NFC/Nerin and AMS/Marengo programmes were undertaken on samples of drill core specially produced for metallurgical characterisation. Approximately 22 t of full core, representing a variety of feed types, was drilled for metallurgical testing. About 80% of the core was sent to Beijing for testing under the guidance of NFC, where the balance of the core was delivered to the ALS -Ammtec laboratories in Perth for predominantly parallel testing under the direction of AMS.

A large (45 t) sample extracted from an adit has also to been delivered to ALS -Ammtec for additional potential testing including:

- Bulk testing of the molybdenum extraction circuit at a scale large enough to deliver product samples
- Pilot scale comminution testing
- Pilot scale locked cycle flotation testing

Testwork completed to date provides an appreciable level of confidence regarding the crushing and grinding characteristics of the feed. Flotation performance of the main feed types has been demonstrated in the NFC managed metallurgical testwork programme, but further progress on the AMS/Marengo programme is required prior to definitive reporting of the results and finalisation of the process design. This is particularly relevant for the cleaning flotation and magnetic separation detailed testing elements.

13.2 Feed Type and Sample Descriptions

For the purposes of metallurgical characterisation, feeds from the Yandera deposit may be generally classified into 3 main types, ie: oxide, mixed and hypogene. The hypogene feed type represents the majority of available material (+80%) and contains primary Cu sulphide mineralisation such as chalcopyrite and bornite. Oxide feeds contain secondary copper minerals and mixed feeds may contain both oxidised and sulphide minerals. Little weathering of the oxide feed type is noted, where the description relates to the mineral types as compared to the weathering nature of the host material.

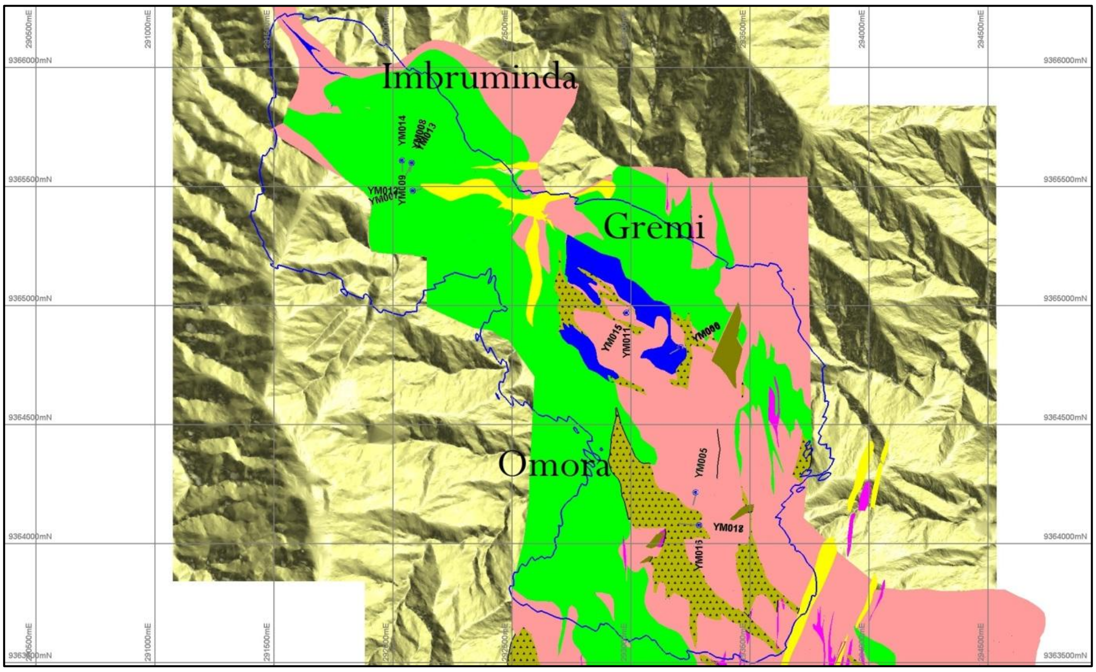
Three main deposits are currently included in the resource, ie: Omora, Gremi and Imbruminda. Metallurgical testwork samples are generally classified into the following types:

Oxide	Contains significant quantities of oxide and secondary Cu sulphide minerals. Samples generally composited from oxide zones from each deposit.
Mixed	Samples generally composited from mixed zones from each deposit and contain primary and secondary sulphide Cu mineralisation and potentially oxide Cu minerals.
Omora Hypogene	Sulphide Cu minerals from the Omora deposit.
Gremi Hypogene	Sulphide Cu minerals from the Gremi deposit.
Imbruminda Hypogene	Sulphide Cu minerals from the Imbruminda deposit.

The AMEC-Minproc metallurgical testwork programme is largely superseded by more recent work and sample details for that programme are not detailed herein.

Samples for the NFC/Nerin and AMS/Marengo metallurgical testwork programmes were obtained from over 2,260 m of full core specifically drilled for metallurgical testwork. The locations of the 14 drill holes (YM-005 to YM-018) were selected to offer spatial representivity of the 3 deposits as shown in Figure 31.

Figure 31 Feasibility Study Metallurgical Sample Drill Holes Locations



From each 1 m interval, 800 mm was despatched to the Beijing laboratory (~18.5 t) and the remaining 200 mm (~4.4 t) sent to ALS-Ammtec in Perth.

The Beijing samples were classified and combined into 5 composites as outlined above, ie: Oxide, Mixed and hypogene samples from Omora, Gremi and Imbruminda. Head assay data for these samples are detailed in Section 13.5.1.

The Perth samples, 200 mm from every 1 m length of core, were combined into approximately 750 Individual samples (generally 3 m intervals corresponding to the Resource database) and assayed for a comprehensive suite of elements. The Individual samples were then composited to 8 Composite samples and 23 Variability samples, ie:

Composite Samples:	Preliminary Bulk #1, C1 Oxide, C2 Mixed, C3 Preliminary Bulk #2, C4 Omora hypogene, C5 Gremi hypogene, C6 Imbruminda hypogene and C7 Low Grade (representing dilution).
Variability Samples:	V1 to V24 representing various high and low ranges of Cu grades, Mo grades and expected mineralogical makeup on the basis of S:Cu and Fe:S ratios.

Head assay data for these samples are detailed in Section 13.6.1.

13.3 Comminution Characterisation

13.3.1 Comminution Characterisation Testwork

A comprehensive comminution characterisation testwork programme was completed in 2009 by ALS-Ammtec under the supervision of AMEC-Minproc and testing included:

- Bond Crushing Work Index (BCWI).
- Bond Rod Mill Work Index (BRMWI).
- Bond Ball Mill Work Index (BBMWI).
- Bond Abrasion Index (Ai).
- JKMRC drop weight testing (including SMC tests) for the establishment of the corresponding Drop Weight Index (DWi) and 'A' and 'b' parameters.

A summary of the testing results is presented in Table 28.

Table 28 Comminution Parameters Summary

Criteria	Comminution Testwork Parameter					
	BCWI (kWh/t)	**BRMWI (kWh/t)**	**BBMWI (kWh/t)**	**Ai (-)**	**DWi (kWh/m^3)**	**Axb (-)**
Maximum	7.7	17.3	19.2	0.30	7.5	119
80th percentile	7.6	15.8	17.2	0.17	5.5	46
50th percentile	7.3	13.8	15.1	0.10	4.7	56
Minimum	6.4	12.6	8.0	0.03	2.0	37

The comminution characterisation testwork results indicate:

- Consistent results as demonstrated by the relatively comparable 80th percentile and 50th percentile values for all tests.
- Medium to high hardness characteristics with average BRMWI and BBMWI values of near 14 kWh/t and 15 kWh/t, respectively.
- Moderately high to medium JKMRC 'Axb' values.
- Relatively low abrasion characteristics.
- Suitability for a range of comminution techniques including semi-autogenous (SAG) grinding.

13.3.2 Comminution Simulations

AMS commissioned Orway Mineral Consultants (OMC) to review comminution circuit alternative configurations. OMC studied the comminution characteristics identified in the previous testwork (as summarised in Section 13.3.1) and concluded that, for these feed types, the value of the fSAG factor (the ratio between actual power draw in a SAG mill and the theoretical power predicted by the Bond equations) for single stage SAG milling of primary crushed feed to a P80 size of 150µm would be 1.19. Allowing for a 5% factor of uncertainty and taking the 85% percentile value for the relevant characteristics, the power demand for this duty calculates at 16.0 kWh/t.

OMC is currently undertaking a more detailed update of this work and the results of that exercise will be reported separately.

13.4 Metallurgical Testwork – AMEC-Minproc Programme

Testwork supervised by AMEC-Minproc included bulk flotation testing and preliminary Cu cleaning, Mo separation flotation and scoping level magnetite separation.

13.4.1 Bulk Flotation

Six samples (3 from Omora and 3 from Gremi) were subjected to rougher-scavenger flotation tests to investigate the effect of grind size, slurry density, slurry pH and reagent addition. In general, the results indicated:

- Relative insensitivity to grind size and an optimum P80 grind size of 150 µm was selected on the basis of the recovery values and assessment of operating costs associated with comminution.
- Optimum flotation feed slurry density of 32.5% solids (w/w).
- High slurry pH (+12) reduced sulphide gangue flotation but had a negative effect on flotation recoveries of valuable metals.
- Mixed results from various tested collectors, predominantly related to the content of Fe-sulphides such as pyrite.
- Cu recoveries of over 91% and preliminary Mo recoveries around 80%.
- Recovery of gold (Au) and silver (Ag) to flotation concentrates.

13.4.2 Bulk Concentrate Cu Cleaning Flotation

A series of bulk flotation cleaning tests were undertaken which demonstrated that the rougher concentrate weight could be significantly reduced with relatively low impact to metal recoveries. However, the work was preliminary in nature and superseded by more recent testwork outlined in subsequent sections of this report.

13.4.3 Molybdenum Flotation

Some rougher Mo separation tests were undertaken and demonstrated the capacity for Mo separation. However, Mo cleaning testing was not completed and relatively low Mo grades (5% to 8%) were reported. This work has similarly been superseded by recent programmes as described below.

13.4.4 Magnetite Separation

Scoping level testwork established the potential to produce a magnetite concentrate at saleable grade (+ 60% Fe). However, even with regrinding of the rougher magnetic separation (RMS) concentrate to around 34 µm (P80), silica levels remained above the notional penalty limit (4.5% SiO2) in many instances. Further work has been undertaken or is planned in this area, including optimisation of RMS concentrate regrind size and reverse SiO2 flotation on the cleaner magnetic separation (CMS) concentrate.

13.5 Metallurgical Testwork – NFC/Nerin Programme

Testwork was undertaken by NFC/Nerin at the MGRIMM Beijing laboratories during 2012 and included:

- A detailed mineralogical assessment.
- Bulk, Cu cleaning and Mo separation/cleaning batch flotation testing.
- Locked cycle bulk, Cu/Mo concentrate cleaning and Mo roughing/cleaning flotation.

- Scoping level magnetite separation.

In general, this programme was undertaken by the initial optimisation of metallurgical parameters on the Imbruminda hypogene composite sample, followed by relatively large scale continuous testing of each Composite sample in locked cycle. The flowsheet for the locked cycle testing was very similar to the preliminary Yandera process plant flowsheet as described in Section 17.1, with the exception of no intermediary regrind of the bulk concentrate prior to the Cu/Mo concentrate cleaning stage.

This programme is substantially complete (although not formally reported to date) and the draft results are presented in the following sections.

13.5.1 Head Assays

Selected head assays for the five NFC/Nerin Composite samples are presented as Table 29.

Table 29 NFC/Nerin Composite Sample Head Assay Summary Composite Description

Analyte	Unit	Composite Description				
		Oxide	Mixed	Omora	Gremi	Imbruminda
Copper (Cu)	%	0.76	0.37	0.33	0.65	0.60
Molybdenum (Mo)	ppm	180	870	160	280	210
Gold (Au)	g/t	0.22	0.18	0.12	0.12	0.31
Silver (Ag)	g/t	6.17	4.68	5.00	6.40	3.70
Sulphur (S)	%	0.30	0.35	0.65	0.78	0.37

13.5.2 Mineralogical Evaluation

Each Composite sample was subjected to a comprehensive mineralogical examination to determine the valuable metal minerals, precious metal deportment and gangue components. General results of the evaluation include:

Oxide	Contains significant quantities of Cu oxide minerals such as malachite, libethenite and cuprite, in addition to chalcopyrite and bornite.
Mixed	Predominantly chalcopyrite and bornite sulphide Cu mineralisation.
Omora	Predominantly chalcopyrite and bornite sulphide Cu mineralisation with significant quantities of pyrite.
Gremi	Predominantly chalcopyrite and bornite sulphide Cu mineralisation.
Imbruminda	Predominantly chalcopyrite and bornite sulphide Cu mineralisation.

Molybdenite was the only Mo containing mineral reported.

13.5.3 Flotation Conditions Optimisation

Initially, sub-samples of the Imbruminda composite sample were subjected to a series of tests to optimise variables such as grind size, slurry pH, flotation time and reagents type and usage. Optimised conditions included a P80 grind size of ~130 µm, 250 g/t lime addition and a proprietary collector (BK-901).

A similar series of tests were undertaken to optimise variables for Mo separation from a reground cleaned Cu/Mo concentrate, including regrind size and reagent addition conditions. A regrind P80 size of approximately 60 µm was selected, as was the addition of a dispersant (Na_2SiO_3) and Cu depressant (BK510).

Locked cycle Mo concentrate cleaning tests were also undertaken including an additional regrind stage between the 3rd and 4th Mo cleaning stages to a P80 size of approximately 45 µm.

Combined results from each composite sample for the large scale locked cycle flotation tests are presented as Table 30.

Table 30 Flotation Results Summary – NFC/Nerin Composite Description

	Unit	Composite Description				
		Oxide	Mixed	Omora	Gremi	Imbruminda
Bulk Concentrate						
Cu Recovery	%	Results Not Available to Date				89.8
Mo Recovery	%					85.7
S Recovery	%					91.9
Cu Grade	%					30.3
Mo Grade	%					1.00
Cu Concentrate						
Conc. Weight	%	1.99	0.91	1.48	2.03	1.74
Cu Recovery	%	61.5	81.0	84.0	89.7	88.3
Mo Recovery	%	7.9	0.3	1.3	3.6	3.4
Au Recovery	%	Results Not Available to Date				74.2
Ag Recovery	%					60.3
Cu Grade	%	23.6	32.6	18.6	28.8	30.7
Mo Grade	%	0.07	0.03	0.01	0.05	0.04
Mo Concentrate						
Conc. Weight	%	0.021	0.170	0.027	0.048	0.034
Mo Recovery	%	55.9	90.8	82.2	81.4	80.4
Cu Recovery	%	0.01	0.12	0.03	0.02	0.01
Mo Grade	%	48.5	48.4	47.0	48.4	50.7
Cu Grade	%	0.40	0.27	0.30	0.23	0.19

The flotation results presented above indicate:

- Cu recovery losses of approximately 1.5% from rougher-scavenger flotation to Cu/Mo bulk flotation concentrate (for subsequent Mo separation) for the Imbruminda hypogene Composite sample tested.
- Very good Cu recoveries to the final Cu concentrates for Gremi and Imbruminda hypogene samples of over 88%. Relatively good Cu grades were also reported for these samples.
- Lower final Cu recovery for the Omora hypogene material at 84% at a poorer Cu grade of 18.6%. This sample may benefit from a modified reagent addition regime within the Cu cleaning circuit to depress the relatively high pyrite content of this material.
- Generally good Mo recoveries for the sulphide samples at very good final Mo concentrate grades of over 47% Mo.
- The Mixed sample flotation performance showed moderate Cu recovery (81%) but at a good grade (+32%) suggesting potential for improved recovery to a satisfactory Cu grade of perhaps +25%. Mo flotation performance was also very good for this sample, probably affected by the relatively high Mo grade of this sample (870 ppm).

- The Oxide sample demonstrated relatively poor performance for both Cu and Mo recovery. This test flowsheet was modified to include a second Cu scavenger stage in an effort to improve Cu recovery. However, the oxide Cu minerals have proven difficult to recover under the conditions tested to date.

In addition, detailed analysis of the Imbruminda testing final concentrates were completed and showed no detrimental elements with respect to potential smelter penalties. The final Mo concentrate contained approximately 230 ppm Rhenium (Re) which may provide additional revenue for this product.

13.5.4 Sulphide Concentrate Analyses

In addition, detailed analysis of the Imbruminda testing final flotation concentrates was completed and showed low concentrations of detrimental elements, indicating no forecast issues with respect to potential smelter penalties. The final Mo concentrate also contained approximately 230 ppm Rhenium (Re) which may provide additional revenue for this product. A summary of the detailed concentrate analysis is presented as Table 23.

NFC/Nerin Final Sulphide Concentrates Analysis Summary

Analyte	Unit	Cu Concentrate	Mo Concentrate
Copper (Cu)	%	30.72	0.19
Molybdenum (Mo)	%	0.041	50.67
Gold (Au)	g/t	11.67	2.92
Silver (Ag)	g/t	129	25.1
Rhenium (Re)	ppm	<50	230
Sulphur (S)	%	28.93	36.32
Iron (Fe)	%	19.07	2.64
Arsenic (As)	%	0.061	0.009
Lead (Pb)	%	0.079	0.056
Zinc (Zn)	%	0.94	0.013
Alumina (Al_2O_3)	%	2.65	2.70
Calcium Oxide (CaO)	%	0.43	0.56
Magnesium Oxide (MgO)	%	0.40	1.48
Phosphate (P_2O_5)	%	0.055	0.11
Silica (SiO_2)	%	9.78	8.24

13.5.5 Magnetite Separation

The NFC/Nerin programme included series of tests to establish optimum conditions for RMS, RMS concentrate regrind size and CMS for the Imbruminda Composite sample. Under the optimised conditions, a final magnetite concentrate grading over 65% Fe and under 3% SiO_2 was generated and represents a saleable product of around 0.9% of the feed weight.

13.6 Metallurgical Testwork – AMS/Marengo Programme

13.6.1 Sample Head Assays

Selected head assays (mainly calculated grades from the flotation testwork results) for the AMS/Marengo (ALS-Ammtec) programme Composite samples are presented as Table 31

Table 31 ALS-Ammtec Composite Sample Head Assay Summary Composite Sample Description

Analyte	Unit	Composite Sample Description					
		C1	C2	C3	C4	C5	C6
		Oxide	Mixed	Bulk #2	Omora	Gremi	Imbruminda
Copper (Cu)	%	0.79	0.45	0.50	0.38	0.51	0.54
Molybdenum (Mo)	ppm	114	571	213	194	190	167
Gold (Au)	g/t	0.10	0.25	0.17	0.02	0.06	0.12
Silver (Ag)	g/t	7.9	2.6	2.9	2.9	3.0	2.9
Sulphur (S)	%	0.33	0.34	0.53	0.35	0.24	0.19

13.6.2 Preliminary Flotation Testing – Bulk Composite Samples

Preliminary Bulk Composite (#1) rougher/cleaner Cu flotation performed predominantly to produce flotation tail samples for environmental related testwork. Salient results included:

- Rougher testwork completed at 150 µm P80 grind, 35% solids and A3302 collector.
- 90.5 % Cu recovery to rougher concentrate at 16.9 % Cu grade.
- 78.9 % Mo recovery to rougher concentrate at 0.73 % Mo grade.
- Excellent Cu/Mo concentrate cleaning performance with Cu grades of 36.8 %, 36.5 %, 33.8 % and 21.1 % for Cu cleaner concentrates 1 to 4, respectively.
- Overall Cu recovery to combined Cu cleaner 1 – 4 concentrates of 87.6 % at a Cu grade of 34.9 % within a cumulative concentrate weight of 1.4 %.

Preliminary Bulk Composite (#2 = C3) rougher/cleaner Cu flotation was undertaken to produce repeat flotation tail samples for environmental related testwork under identical procedure and with similar results to above.

The cleaned Cu/Mo concentrates from these tests were combined and employed for scoping level Mo separation and 4 stage Mo cleaning testwork. The test was undertaken at 25% solids slurry density, NaHS collector to -500 mV (Plat ref) and kerosene and encouraging results were reported as shown in Table 32 and included:

- Over 47% Mo grade final concentrate.
- Mo4 CC1 – 1 and Mo4 CC1 -2 Rhenium (Re) assays of 344 ppm and 228 ppm, respectively.
- Mo cleaning tail grade of 30.4 % Cu (final Cu concentrate product).

Table 32 ALS-Ammtec Bulk Composite Mo Flotation Results Summary Sample Cumulative						
	Sample			**Cumulative**		
Sample Description	**Time (min)**	**Mo Grade (%)**	**Mo Dist'n (%)**	**Time (min)**	**Mo Grade (%)**	**Mo Dist'n (%)**
Mo 4 CC1 - 1	10	47.9	57.2	10	47.9	57.2
Mo 4 CC1 - 2	6	36.6	25.1	16	43.8	82.3
Mo 3 CC	5	11.1	1.3	21	41.9	83.6
Mo 2 CC	3.5	16.7	2.6	24.5	40.0	86.2
Mo 1 CC	3.5	9.8	4.4	28	34.8	90.6
Mo Rougher Tail		0.06	5.8			

13.6.3 Composite Samples – Rougher-Scavenger Flotation Optimisation

In general, a series of flotation tests was completed to ascertain optimum conditions for rougher-scavenger flotation to a bulk Cu/Mo concentrate. Initial conditions were obtained from the AMEC-Minproc work described in Section 13.4 and tested parameters included:

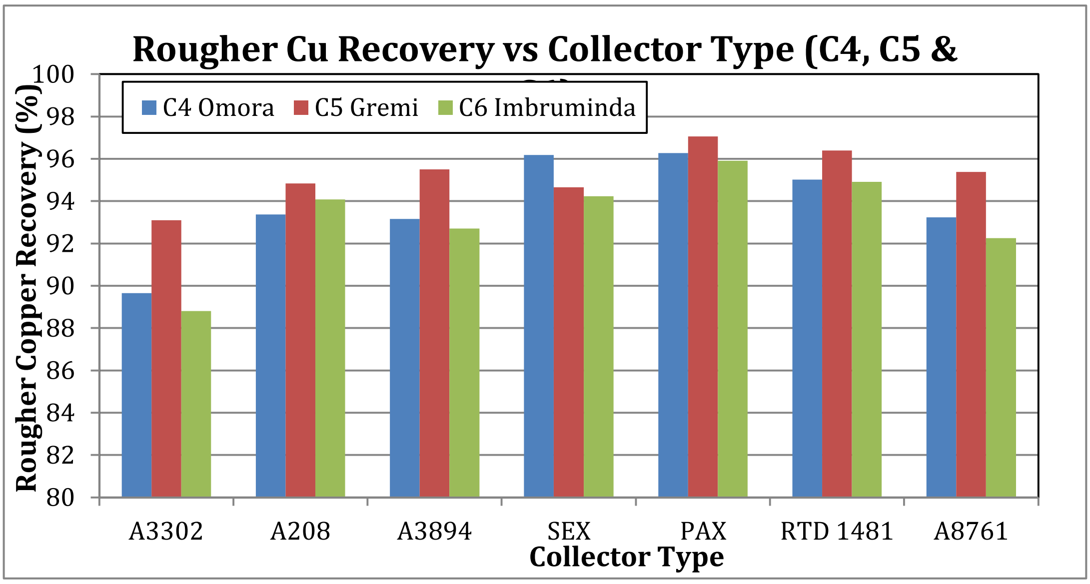
- Three flotation feed slurry density conditions, ie: 25 % solids, 35 % solids and 45 % solids (w/w) at a P80 grind size of 150 µm and collector addition of A3302 (hypogene samples) and PAX/NaHS (oxide/mixed samples). A flotation feed density of 35% solids was selected from the analysis of results from this testing series.
- Three grind size conditions, ie: Oxide (C1) and Mixed (C2) samples at P80 grind sizes of 106 µm, 125 µm and 150 µm and Hypogene (C3, C4, C5, C6 and C7) samples at P80 grind sizes of 125 µm, 150 µm and 180 µm. Each test was undertaken at a slurry density of 35% solids and similar collector addition regimes to the slurry density series described above. The results from the 18 test grind size series indicated relatively minor differences between the tested grind sizes and no strong trends could be established from the data. As with the slurry density series, most final Cu recovery results were within ± 1 % to 2 % of each other. A P80 grind size of 150 µm was selected for all ongoing rougher flotation laboratory testwork.
- The rougher flotation performance for each of the hypogene composite was assessed at a P80 grind size of 150 µm and 35% solids slurry density with the following collector types:
    - A3302 Xanthate Allyl Ester.
    - A208 Dithiophosphate
    - A3894 Thionocarbamate
    - SEX Sodium Ethyl Xanthate
    - PAX Potassium Amyl Xanthate
    - RTD1481 Xanthate Ester
    - A8761 Monothiophosphonate

The results of the collector testwork series indicated superior performance of the xanthate collector types for valuable metal recovery, particularly PAX, as shown in Table 33 and Figure 32.

Table 33 ALS-Ammtec Collector Series Metal Recovery Results Composite Sample Description

Parameter	Unit	Composite Sample Description					
		C1	C2	C3	C4	C5	C6
		Oxide	Mixed	Bulk #2	Omora	Gremi	Imbruminda
Collector Type	-	PAX/NaHS		A3302	PAX		
Ro C1-4 Weight	%	3.53	2.99	2.69	3.93	3.81	3.11
Cu Recovery	%	62.8	90.5	90.9	96.3	97.1	95.9
Mo Recovery	%	59.7	91.1	76.7	89.7	89.6	~85
Au Recovery	%	68.3	84.9	75.4	N/A to Date		
Ag Recovery	%	59.9	63.9	64.1	66.3	63.7	64.4
S Recovery	%	94.3	+ 89	97.8	N/A to Date		

Figure 32 ALS-Ammtec Collector Series Cu Recovery Results



The results indicated:

- Copper recoveries around 96% were obtained from the open circuit rougher-scavenger testing programme on hypogene samples and compare to around 90% for the previous A3302 based testing.
- Similarly, very good Mo recoveries to bulk concentrates were shown for the hypogene feed type and Mixed samples.
- Oxide Cu and Mo recovery continued to be problematic at 60% to 65% recovery.
- Similarly, grades of the various rougher-scavenger concentrates and tail samples were reasonable as shown in Table 34 and Figure 31.

Table 34 ALS-Ammtec Collector Series Metal Grade Results Composite Sample Description							
Parameter	**Unit**	**Composite Sample Description**					
		C1	**C2**	**C3**	**C4**	**C5**	**C6**
		Oxide	**Mixed**	**Bulk #2**	**Omora**	**Gremi**	**Imbruminda**
Collector Type	-	PAX/NaHS		A3302	PAX		
Ro 1 Cu Grade	%	27.7	25.2	29.2	17.9	25.4	32.9
Ro 1-4 Cu Grade	%	14.2	13.6	17.3	10.1	13.3	17.5
Ro 1-4 Mo Grade	%	0.18	1.67	0.60	0.43	0.43	0.44
Ro 1-4 Au Grade	g/t	1.8	7.3	4.4	N/A to Date		
Ro 1-4 Ag Grade	g/t	81	57	65	48	44	56
Ro 1-4 S Grade	%	9.1	10.7	16.5	N/A to Date		
Scav. Tail Cu Grade	%	0.31	0.04	0.05	0.02	0.02	0.02
Scav. Tail Mo Grade	ppm	45	50	50	20	20	20

13.6.4 Composite Samples - Planned Testwork

The ALS-Ammtec programme is ongoing and the following work is either underway or planned for the near future at the time of writing this report:

- Cu/Mo bulk concentrate cleaning, including:
  - C1 Oxide Composite sample rougher recovery optimisation, but limited improvements likely as S recovery to date is +94 %.
  - PAX for C2 Mixed Composite sample.
  - Preparation of bulk rougher concentrate samples from each major Composite sample (C1, C2, C4, C5 and C6).
  - Single stage Cu cleaning at four regrind sizes, ie: as-produced, 75 µm, 53 µm and 38 µm with PAX.
  - Single stage Cu cleaning at optimum regrind size at three reagent conditions.
  - Dual stage Cu cleaning at optimum regrind size and conditions.
  - Locked cycle Cu cleaning at optimum stages, regrind size and conditions.
- Mo Roughing and Cleaning
  - Preparation of bulk Cu cleaner concentrate samples from each major Composite sample (C1, C2, C4, C5 and C6).
  - Single stage Mo roughing at three regrind sizes, ie: as-produced, 53 µm and 38 µm (pending Cu cleaning optimum regrind size).
  - Multi stage Mo cleaning at optimum regrind size at three reagent conditions.
  - Locked cycle Mo cleaning at optimum stages, regrind size and conditions.
- Magnetite Separation
  - Combination of suitable bulk rougher tail samples from each major Composite sample (C1, C2, C4, C5 and C6).
  - Primary magnetic separation (LIMS).
  - Levin test on primary magnetite concentrate for regrinding power determination.
  - Secondary magnetic separation (LIMS) at four P80 regrind sizes, ie: 53 µm, 45 µm, 38 µm and 30 µm.
  - Reverse SiO_2 flotation of final magnetite concentrate (as required).

13.6.5 *Variability Samples – Planned Testwork*

The following work is planned for the Variability samples (pending optimisation of all parameters via the Composite sample programmes described above:

- Treat each Variability sample (V1 to V23) separately and identically.
- Bulk flotation under optimised conditions, ie: P80 grind size of 150 µm, 35% solids slurry density and PAX collector regime.
- Cu cleaner flotation under optimised conditions (refer Section 13.6.4).
- Mo rougher and cleaner flotation under optimised conditions (refer Section 13.6.4).
- Magnetic separation and reverse flotation on combined flotation tail under optimised conditions (refer Section 13.6.4).

14. MINERAL RESOURCE ESTIMATE

14.1 Geological Models - Lithology

The Yandera area geological interpretation and subsequent wire-frame modelling was carried out by Mr. Gabriel Liam and Malai Ila'ava of Marengo in conjunction with Mr. Sam Ulrich of Ravensgate. The mineralisation and geological interpretation work used all available surface mapping, data from drill hole logging as well as some mapping and samples from two underground adits in Gremi. Generally the identified material type domains were delineated by broad 3-D polygons based on drill-holes containing data for the main analytical elements studied, primarily copper as well as molybdenum and gold. The process for geological modelling was undertaken by digitising section strings which outlined broad mineralisation boundaries based on some geostatistically derived population sets.

A separate set of interpretation strings were developed for the priority copper domains as well as separate additional sets of interpretation strings for each of the molybdenum and gold domains.

Similarly, some alteration zone boundaries were also developed from available drill-hole logging in conjunction with some interpretation of shear / breccia zones in localised areas where these were interpreted to affect the underlying porphyry lithology. The mineralisation and alteration zone strings were then triangulated to build full 3-D solid lithology surfaces that were then 'intersected' where necessary to develop true 3-D solid models that were subsequently used to code the respective composite and block model file item codes. One additional material type surface data set was also developed for coding weathering and oxidation states or near topographic surface material in the block model. The weathering / oxidation surfaces were again developed from the available drill-hole logging.

The mineral resource estimation carried out for this study utilised MineSight$_{tm}$ software. One large block model was constructed for the deposit which covered and extended where necessary beyond the current extent of drilling. In addition to the underlying geological and material type coding in the model a set of grade interpolation items for Cu, Mo and Au were incorporated. The method of grade interpolation used for all elements was the Ordinary Kriging technique which used calculation parameters based upon localised geostatistical and associated variography studies.

The block size was chosen to represent a volume approaching a large selective mining unit and it is smaller than that used in previous preliminary studies. The block size chosen for this study was reviewed carefully with respect to the smaller high grade domains as well as the highly variable topography which affects the weathering / oxidation state material geometries which tends to be directly related to the topography. The best method for encapsulating the variable geometries and to minimize the block model complexity is by dispensing with coded block proportions, by using a relatively small block and a 50% threshold 'block-in / block-out' coding regime. The dimensions of the blocks were set at 10 metres East x 10 metres North x 10 metres RL. In total 170 block model benches were used to cover the elevation range of 740-2440m RL.

The coded block volumes in the block model were checked and validated against the 'raw' analytical 3-D wire-frame volumes.

The primary search used in the Ordinary Kriging algorithm interpolation runs was generally 180m N-S, 180m E-W and 180m Z. The typical secondary search ellipsoid dimensions of 135m (major), 110m (semi-major) and 50m (cross-strike). These search ellipsoid parameters were derived after a review of the variography modelling described in Section 12.4. The semi-variogram models developed for this study allowed anisotropic weighting to be used during the interpolation process according to each specific localised mineralisation type code (ZONEA for Cu, ZONEB for Mo and ZONEC for Au) as well as localised AREA domains used to account for the local Cu, Mo and Au mineralisation geometry orientation.

A variable in-situ bulk density (IBD) regime was applied to the block model based on the main weathering / oxidation state (OXID) item. For the near surface highly weathered zones (OXID=1) the bulk density was set to 2.2t/m^3 in the block model. Similarly, the bulk density for the partly weathered (hypogene) material was set to 2.4t/m^3. Below this, for the unweathered and un-oxidised / sulphide zones the bulk density was set to 2.6t/m^3. The bulk densities as coded to the block model are referenced directly to generate reported mineralisation tonnage tables.

14.2 Mineralisation Domain Models – Copper – (ZONEA)

A set of 3-D mineralisation domain models was developed to encapsulate the majority of observed copper mineralisation. These mineralisation domain models were developed in conjunction with a geostatistical review of the available copper analyses derived from the drilling data. A total of seven separate domains were developed with delineation cut-off's starting at a 150ppm Cu lower cut-off with the highest grade domain being delineated using a 3,000ppm Cu lower cut-off. An integer assignment of 1→7 was assigned to each mineralisation wire-frame and these values were in turn used to code a composite file and block model item with values of 1→7 for each copper mineralisation domain. Table 35 below describes the general copper mineralisation zone wire-frame characteristics.

Table 35 List of the Yandera Model Area Cu Coding Domains and General Orientations

Cu Code (ZONEA)	Zone Name (copper)	Analytical 3-D Model Volume (cubic metres)	Azimuth (approx) (degrees)	Plunge (approx) (degrees)	Dip (E or W) (degrees)
1	Imbruminda 150 ppm	919,318,821	300	+10	-88 (East)
2	Gremi 300 ppm	432,726,535	300	+20	-88 (East)
3	Omora 350 ppm	262,028,781	310	-0	-88 (East)
4	Omora 1500 ppm	41,029,159	305	-0	-88 (East)
5	Imbruminda 2000 ppm	101,292,484	305	+10	-88 (East)
6	Gremi 2000 ppm	86,466,978	300	+20	-88 (East)
7	New Omora 3000 ppm	6,915,045	310	-0	-88 (East)

Domains are an interpretation of grade continuity and thus some domain contacts were adjusted to generally conform to a similar or parallel orientation to the known shear zones or interpreted breccia / mineralisation conduit zones. Copper mineralisation modelling was extended into peripheral or poorly drilled areas only if the copper grade observed was significant and / or was interpreted to be an extension of any given interpreted structural or conduit zone.

14.3 Mineralisation Domain Models – Molybdenum – (ZONEB)

Similar to the copper mineralisation domains, a set of 3-D mineralisation domain models was also developed to encapsulate the majority of observed Mo mineralisation. These mineralisation domain models were again developed in conjunction with a geostatistical review of the available molybdenum analyses derived from the drilling data. The Mo domains were developed to some extent independently of the Cu domains as Mo distribution was observed to differ from the Cu mineralisation. A total of nine separate Mo mineralisation domains were developed with delineation cut-off's starting at a 5ppm Mo lower cut-off with the highest grade domain being delineated using a 300ppm Cu lower cut-off. An integer assignment of 1→9 was assigned to each mineralisation wire-frame and these values were in turn used to code a composite file and block model item with values of 1→9 for each molybdenum mineralisation domain. Table 36 below describes the general molybdenum mineralisation zone wire-frame characteristics.

Table 36 List of the Yandera Model Area Mo Coding Domains and General Orientations

Mo Code (ZONEB)	Zone Name (molybdenum)	Analytical 3-D Model Volume (cubic metres)	Azimuth (approx) (degrees)	Plunge (approx) (degrees)	Dip (E or W) (degrees)
1	Gremi 5 ppm	263,129,279	295	+15	-88 (East)
2	Gremi 20 ppm	80,077,700	300	+20	-88 (East)
3	Gremi 150 ppm	12,342,355	300	+20	-88 (East)
4	Imbruminda 5 ppm	341,771,778	305	-0	-88 (East)
5	Imbruminda 30 ppm	45,570,244	315	-0	-88 (East)
6	Imbruminda 300 ppm	872,073	320	-0	-88 (East)
7	Omora 5 ppm	172,532,562	310	-0	-88 (East)
8	Omora 30 ppm	23,015,324	300	-0	-88 (East)
9	Omora 200 ppm	797,834	300	-0	+80 (West)

Domains are an interpretation of grade continuity and thus some domain contacts were adjusted to generally conform to a similar or parallel orientation to the known shear zones or interpreted breccia / mineralisation conduit zones. As with copper some of the molybdenum mineralisation modelling was extended into peripheral or poorly drilled areas only if the molybdenum grade observed was significant and / or was interpreted to be an extension of any given interpreted structural or conduit zone.

14.4 Mineralisation Domain Models – Gold – (ZONEC)

As with the Cu and Mo mineralisation domains, a set of 3-D mineralisation domain models were also developed to encapsulate the majority of observed Au mineralisation. These mineralisation domain models were again developed in conjunction with a geostatistical review of the available gold analyses derived from the drilling data. The Au domains were developed to a large extent independently of both the Cu and Mo domains as Au distribution was observed to differ significantly from that of Cu and Mo. A total of ten separate Au mineralisation domains were developed with delineation cut-off's starting at a 0.01ppm Au lower cut-off with the highest grade domain being delineated using a 0.4ppm Au lower cut-off. An integer assignment of 1→10 was assigned to each mineralisation wire-frame and these values were in turn used to code a composite file and block model item with values of 1→10 for each gold mineralisation domain. Table 37 below describes the general gold mineralisation zone wire-frame characteristics.

Table 37 List of the Yandera Model Area Au Coding Domains and General Orientations					
Au Code (ZONEC)	**Zone Name (gold)**	**Analytical 3-D Model Volume (cubic metres)**	**Azimuth (degrees)**	**Plunge (degrees)**	**Dip (E or W) (degrees)**
1	Gremi 0.01 ppm	189,594,617	295	+15	-88 (East)
2	Gremi 0.04 ppm	28,206,123	300	+20	-88 (East)
3	Gremi 0.30 ppm	408,045	300	+5	-88 (East)
4	Imbruminda 0.01 ppm	599,209,735	300	-0	-88 (East)
5	Imbruminda 0.04 ppm	102,812,713	310	-10	-88 (East)
6	Imbruminda 0.3 ppm	1,387,035	320	-0	-88 (East)
7	Omora 0.01 ppm	80,741,611	315	-0	-80 (East)
8	Omora 0.05 ppm	3,599,818	305	-20	-88 (East)
9	Omora 0.4 ppm	65,905	290	-25	-88 (East)
10	Dimbi 0.04 ppm	3,877,018	300	-5	-88 (East)

As with the Cu and Mo domains, the gold domains are an interpretation of grade continuity and thus some of the mineralisation contacts were adjusted to generally conform to a similar or parallel orientation to the known shear zones or interpreted breccia / mineralisation conduit zones.

14.5 Estimation of Priority Copper Item - (CUPC1)

The main CUPC1 composite item available from the ‘coded’ composite files was the item used in block model interpolation. With the sometimes un-even drilling density, there is some consideration required in terms of the relatively small numbers of unevenly distributed sample clusters in some localised areas. After a brief review of the Cu domain statistics it was concluded that the use of distribution adjustment technique such as block ‘discretisation’ was not necessarily beneficial for producing a better block model estimate given the overall relatively large drill-hole spacing present throughout much of the deposit. The higher grade domains also tend to be relatively well drilled and so don’t require any discretisation adjustments necessarily either. The work presented in Section 0 also supports this decision.

The method used to interpolate copper grades into the main CUPC1 block grade item was Ordinary Kriging. This technique is adequate for the purposes of the estimation outcomes required for the three main elements modelled at Yandera: Cu, Mo and Au. The primary reason for this assessment and the decision to use the Ordinary Kriging is that the mineralisation domains modelled are well ‘constrained’, particularly at the higher cut-off levels, and the deposit displays a quite low overall coefficient of variation. The low coefficients of variation are clearly evident when reviewed using the available 3m down-hole composite set. The Cu distribution statistics and the localised changes in coefficient of variation was interrogated within each of the mineralisation domains.

14.6 Estimation of Molybdenum Item – (MOKR1)

The main MO1 composite item available from the ‘coded’ composite files was the item used in the block model interpolation.

The method used to interpolate molybdenum grades into the main MOKR1 block grade item was Ordinary Kriging. This technique again is adequate for the purposes of the estimation outcomes required for the molybdenum element modelled at Yandera. The molybdenum mineralisation domains modelled to date, as with the copper domains, are relatively well 'constrained' particularly at the higher cut-off levels. The various molybdenum domains display a low overall coefficient of variation. The low coefficients of variation for molybdenum are clearly evident when reviewed using the available 3m down-hole composite set. The Mo distribution statistics and the localised changes in coefficient of variation was interrogated within each of the mineralisation domains.

14.7 Estimation of Gold Item – (AUKR1)

The main AU1 composite item available from the 'coded' composite files was the item used in block model interpolation. The spatial distribution of the gold samples was observed to be somewhat more 'irregular' when compared to the Cu and Mo items.

The method used to interpolate gold grades into the main AUKR1 block grade item was Ordinary Kriging. This technique is adequate for the purposes of the estimation outcomes required for the gold element modelled at Yandera. The gold mineralisation domains modelled to date, as with the copper and molybdenum domains, are relatively well 'constrained' particularly at the higher cut-off levels. The various gold domains display, as expected, a slightly higher overall coefficient of variation when compared to copper or molybdenum, however the coefficient of variation ranges for gold within any given domain as observed from the available 3m down-hole composite set are still at an acceptable level for use in Ordinary Kriging interpolation. The Au distribution statistics and the localised changes in coefficient of variation was interrogated within each of the Au mineralisation domains.

14.7.1 Methods Adopted for the Yandera Project Area.

The main elements of interest at the Yandera project area are primarily copper and secondarily molybdenum and gold. The molybdenum grades observed throughout the deposit are relatively low, and the molybdenum distribution is interpreted to be a related but later stage mineralisation event with respect to copper and as such a separate delineation 3-D wire-frame set was developed and used in the block model. Similarly, gold was modelled by use of a separate set of gold mineralisation wire-frames given the distribution of gold is not interpreted to be directly associated with the copper and molybdenum mineralisation: gold is interpreted to have been deposited during a separate, possibly later stage, mineralising event. The block model developed for Yandera is based upon the 'priority' element copper, and descriptive parameters derived from this element, such as QLTY (quality of estimate item') are then applied 'as is' to the additional molybdenum and gold items.

14.7.2 Yandera Block Model Parameters and Block Size ('SMU') Selection.

After carefully considering the drilling and sample densities and the interpreted mineralisation geometries derived for the primary element copper and the additional ancillary molybdenum and gold elements present at Yandera, it was decided that an initial optimal estimation block size to be used at the project area for block modelling would be 10m by 10m by 10m - (East (X), North(Y), Elev(Z)). This block size is relatively small, however, it is consistent with the general block model requirements to provide the resolution necessary to model geology and mineralisation domains.

Generally an optimal block size should adequately delineate the mineralisation zones within the block model, while simultaneously not compromising the localised estimated block variances during interpolation. The block size chosen should ideally also be as close as possible to a 'Selective Mining Unit' (SMU) as may be required by the mining equipment that may be used at a later stage during mine development. The block dimensions chosen for the Yandera project area represent a compromise between drill density, sample spatial continuity and possible SMU considerations and also the quite large scale of the project area being considered. Model dimensions and parameters are shown in Table 38 below.

Table 38 Yandera Block Model Parameter Summary Table

All Block Model Parameters Associated with Cu (CUPC1) Item.
(Main Items - 'Ordinary Kriging' – Regular 'Uniform Block Size' Block Model).

1. Project Area / Model Parameters – (Local Coordinate System)

- 290600 → 295000 m E – 10.0m (block) – "440 Rows".
- 9362500 → 9367600 m N – 10.0m (block) – "510 Columns".
- 740 → 2440 m RL – 10.0m (block) – "170 Benches". * UNIFORM BLOCK SIZE *
- (No "Sub Blocks").
- Model "starts at" Row 1, Column 1.
- Bench 1 = Top Bench Of Model (Bench 1 'Toe' = 2430 m).
- Row 1 begins at 290600 m E, Column 1 begins at 9362500 m N.

2. Items used and Coded / Interpolated / Calculated for entire block model.

- EAST, NORTH, ELEVATION - (Block Centroids – 'Original Grid').
- CUPC1 ← 1st Copper Item (Cu) – "Ordinary Kriging" – ZONEA=1→7 – Cu(%) *
- MOKR1 ← 1st Molybdenum Item (Mo) – "Ordinary Kriging" – ZONEB=1→9 - Mo(ppm)
- AUKR1 ← 1st Gold Item (Au) – "Ordinary Kriging" – ZONEC=1→6 - Au(ppm)
- QLTY ← Prelim Res Class Item – QLTY = 1, 2, 3 or 4. (1→4 = Good→Poor) - (ZONEA Only)
- OXID ← Weathering / Oxidation State Item – OXID = 1, 2, and 3 - (Oxide-Trans-Fresh)
- SG1 ← Bulk Density Item – [Variable (Based on OXID Items : 2.2, 2.4 or 2.6)
- CODE ← Global Zone Code for ZONEA+ZONEB+ZONEC - (Code=1)
- ZONEA ← Copper Domains Zone Code (Only) = ZONEA - (ZONEA=1→7)
- ZONEB ← Molybdenum Domains Zone Code (Only) = ZONEB - (ZONEB=1→9)
- ZONEC ← Gold Domains Zone Code (Only) = ZONEC - (ZONEC=1→10)
- ALT1 ← 1st Alteration Type Zone Code (Serecitic Alteration).
- ALT2 ← 2nd Alteration Type Zone Code (Potassic Alteration).
- ALT3 ← 3rd Alteration Type Zone Code (Argillic Alteration).
- ALT4 ← 4th Alteration Type Zone Code (Conduit Zone Alteration).
- ZONE ← Summary Code for ZONEA Cu Domains - (ZONE=1) –AREA
- AREA ← AREA domain Code
- TOPO% ← Percentage of Block Below Topographic Surface (0→100%).

Table 39 Main Model Item Names Ranges and Item Description – Yandera				
Item	**Min**	**Max**	**Precision**	**Explanation**
TOPO	0.00	100.00	0.010	Topographic % Item – Current Topo Surface - Defined by Surface DTM Topography - (TOPO = 0-100%) - nb: air blocks are 0% below Topo
ZONEA	0.00	100.00	1.000	Mineralisation Zone Type – Copper Domains - Integer Item Blocks –(ZONEA=1→7) (Defined By 3-D ‘wire-frame’ shells) - (‘+50% ‘block-in / block-out’).
ZONEB	0.00	100.00	1.000	Mineralisation Zone Type – Molybdenum Domains - Integer Item Blocks –(ZONEB=1→9) (Defined By 3-D ‘wire-frame’ shells) - (‘+50% ‘block-in / block-out’).
ZONEC	0.00	100.00	1.000	Mineralisation Zone Type – Gold Domains - Integer Item Blocks –(ZONEC=1→10) (Defined By 3-D ‘wire-frame’ shells) - (‘+50% ‘block-in / block-out’).
ZONE	0.00	100.00	1.000	‘Global’ Material Type Integer Item For ZONEA=1→7 Copper Domain Blocks Only ZONE=1- Priority Mineralisation Domain - (Defined By 3-D ‘wire-frame’ shells).
CUPC1	0.00	100.00	0.010	Copper Item (Cu %) – ‘Ordinary Kriging’
MOKR1	0.00	1000.00	0.010	Molybdenum Item (Mo ppm) – ‘Ordinary Kriging’
AUKR1	0.00	100.00	0.010	Gold Item (Au ppm) – ‘Ordinary Kriging’
ZONEA	0.00	100.00	1.000	‘Global’ Material Type Integer Item For ZONEA=1→7 Copper Domain Blocks Only – Priority Mineralisation Domain - (Defined By 3-D ‘wire-frame’ shells).
ZONEB	0.00	100.00	1.000	‘Global’ Material Type Integer Item For ZONEB=1→9 molybdenum Domain Blocks Only – Priority Mineralisation Domain - (Defined By 3-D ‘wire-frame’ shells).
ZONEC	0.00	100.00	1.000	‘Global’ Material Type Integer Item For ZONEC=1→10 gold Domain Blocks Only – Priority Mineralisation Domain - (Defined By 3-D ‘wire-frame’ shells).
SG1	0.00	10.00	0.010	Bulk Density Item – 2.20 for Oxide, 2.40 for transition and 2.60 for fresh.
OXID	0	40	1.000	1=oxide, 2 = transitional, 3 = fresh
DIST1	0.00	800.00	0.010	Distance of Interpolated Block to Nearest Composite (Interpolated during CUPC1 Interpolation runs)
KERR1	0.00	100.00	0.010	Local kriging variance (Estimated) - (Stored during CUPC1 Interpolation runs).
COMP1	0.00	40.00	1.000	Number Of Local Composites In Search Ellipsoid Available to Interpolate a Block (From CUPC1 Interpolation runs).
CONF1	0.00	100.00	1.000	Interpolation Confidence Item - Derived via Block Calculations using COMP1, DIST1 and KERR1 Items.
QLTY	0.00	100.00	1.000	‘Quality Of Estimate Item’ – Values 1-4 – (Nominally ‘High’ ‘Medium’, ‘Low’ [1, 2 or 3] and ‘Blue Sky’ [4]) - Condensed from CONF Item.
AREA	0.00	100.00	1.000	Geometry Orientation Code - Locally Specific for ZONE=1->3 blocks - All Blocks Coded (AREA = 1-6) (Defined by 3-D wire-frame shells).
RCAT	0.00	100.00	1.000	‘Resource Classification Item’ – Values 1-3 – (‘Meas’ ‘Ind’, ‘Inf’ [1, 2 or 3]) - Condensed from QLTY Item.
ALT1	0.00	100.00	1.000	1st Alteration Type Zone Code (Serecitic Alteration).

Table 39 Main Model Item Names Ranges and Item Description – Yandera				
Item	**Min**	**Max**	**Precision**	**Explanation**
				– Defined by 3-D 'wire-frame' shells.
ALT2	0.00	100.00	1.000	2nd Alteration Type Zone Code (Potassic Alteration). – Defined by 3-D 'wire-frame' shells.
ALT3	0.00	100.00	1.000	3rd Alteration Type Zone Code (Argillic Alteration). – Defined by 3-D 'wire-frame' shells.
ALT4	0.00	100.00	1.000	4th Alteration Type Zone Code (Conduit Zone Alteration). – Defined by 3-D 'wire-frame' shells.

Note:- Any Codes set to '-1.00' or '-2.00' in any of the items in the block model are regarded as 'undefined' by MineSight. This is a 'normal' condition. Nb: Copper Mineralisation domains (ZONA=1→7) Blocks are coded on a 50% 'block-in / block-out' basis.

14.7.3 Model Structure and Coding

Blocks for all deposit areas were coded using the various geological domains and using a 'captured' 3-D nominal >50% threshold block-in/block-out regime – (ZONEA=1→7, ZONEB=1→9, ZONEC=1→10). The volumes of the mineralised domains, when coded using 'Block in/Block out and associated Block percentage' methodology, were each verified with the analytical volumes determined from the relevant mineralisation wire-frames.

An additional important software specific item in MineSight® block models is the TOPO (Topo%) item, which is a the proportion of the block below the current topographic surface. This item is used to ensure that the correct volumetric summaries are reported for mineralised zones particularly if they contact or outcrop at the topographic surface. This percentage item will at the topographic surface 'deplete' block volumes and tonnage where necessary that are normally coded from mineralisation domains.

14.7.4 Block Model - General Construction Process Description

The following is a brief summary of the methods and assumptions employed by Ravensgate to generate the April 2012 mineral resource block model for the Yandera Deposit:

- A set of cross-sections were generated displaying topography profiles and drill assay intervals where available for at least every 20m southwest-northeast section throughout the deposit area.
- Geologic interpretations were made on the cross-sections and entered into the computer as 2-D strings.
- The sectional interpretation 2-D strings delineating both material type zones and grade domains were adjusted in places to 'match' observations with respect to any variation in the copper mineralisation to help refine mineralisation zone orientations or contact zones with the underlying geology.
- Preliminary triangulation of the 2-D strings were then converted to a 3-D mesh wire-frame which was then further refined in conjunction with the current LIDAR topographic surface to produce representative 3-D geometry surfaces and solids (shells) for the main material type zone interfaces. These were 'clipped' with adjacent surfaces of the LIDAR topographic surface to prevent domain 'over-lap' or 'under-lap'. Where possible all wire-frames were directly referenced and 'snapped' to the appropriate drill hole data intercepts.
- The 'grade domain shells' once completed were checked against the 'captured composite' data-set and where necessary were further 'refined' to exclude 'internal waste zones' and other grade level zones that did not fit with the domain grade range criteria. All wire-frames were then checked for 'openings', 'duplicate triangle faces', 'self intersecting triangles' or any other major defects.

- The resultant 'cleaned' '3-D' definition 'shells' were then assigned the appropriate mineralisation code or domain code designation numbers. The ZONE definition shells were then also used to directly code the 3.0m down-hole composite files as well as the block model file. All of the material type coding in the block model was carried out by using a block code and composite file code 'match'. The resultant coded block volumes were checked where necessary to match the original '3-D' definition 'shell' using an analytical volume calculation check.
- A comprehensive set of analytical statistics reviews were carried out for each of the Cu, Mo and Au items within the 3m composite set. The statistics compiled included a range of 'Log Probability' plots for each of the drilling areas and the material type (lithology) domains. The Log Probability plots were then used to determine appropriate sample grade ranges for interpretation of kriging domains. Also reviewed were statistics related to other material type domains including weathering / oxidation state (OXID) and the various alteration type domains (ALT1, ALT2, ALT3 and ALT4).
- A comprehensive set of 'down-hole' and 'between-hole' variograms were then calculated and modelled for the copper, molybdenum and gold kriging domains. Generally all variograms for copper and molybdenum used the 'Normal' (un-transformed) calculation function, whilst the gold item variograms were derived using co-variance calculation rationalisation. A comprehensive AREA domain designation regime was used to sub-divide the main mineralisation zones according to broad mineralisation orientation grouping. These domain areas were used to help set interpolation directions and search ellipsoid dimensions. These domain definition shells were also used to directly code the 3m down-hole composite files and block model file. These domains were also reviewed in consideration of the 'balance' between the local sample support and associated sample variances.
- Both the composites and the block model employed the same mineralisation domain integer Domain (ZONA=1→7) and area domain (AREA) coding regime. This is to 'match' the respective material types during model interpolation. (ie ZONEA=1 Composites are used to estimate ZONEA=1 Block Model).
- A series of check interpolation runs were carried out for the copper, molybdenum and gold items in the block model. These were usually a separate set of runs for each respective mineralisation AREA domain. The molybdenum and gold items were interpolated separately with their own interpolation run series thereby honouring the specific variogram parameters associated with each element.
- The check runs are carried out firstly to check that complete model interpolation and coding had occurred and also to assess the 'average' grades expected in different parts of the block model and to review that the interpolation coding 'coverage' has occurred 'reliably' in the different parts of the block model.
- A set of additional ancillary items were also written to the different block models during the normal (final) interpolation runs. The main items used were the DIST1 (Distance to nearest sample composite), COMP1 (Number of composites) and KERR1 (Calculation Variance or 'Kriging error') items. These items were further statistically reviewed and interrogated to help with the successive mineralisation zone material categorisation calculations. Using these ancillary item parameters, 'CONF' (confidence) item values were then calculated. These item values were then used to initially describe the relative levels of interpolation confidence within the block model. (QLTY Levels = 1, 2, 3 or 4 – Highest to Lowest quality).
- Finally, the QLTY item was refined where necessary to generate the RCAT (Resource classification category) field. The mineral resource reporting tables were produced by using a comprehensive set of MineSight (M608V1, M711V1 and 'PitRes') report files describing and validating the current global 'in-situ' resources (tonnage and grade) for the main items in the block model and at a range of 'lower cut-off' grades based upon the main copper item.

14.8 Interpolation

The copper, molybdenum and gold element items were interpolated using Ordinary Kriging (OK) using a standard version of Minesight® Programme M624V1.

Generally the interpolations of each of the model items is performed in a dual pass with the secondary ellipsoid ranges reduced appropriately based on short range variography for the second interpolation pass. Whilst the copper, molybdenum and gold mineralisation domains were 'constrained' for each deposit area, several separate runs were sometimes required to interpolate grade items into each of the identified and differently oriented mineralisation zone domains. The Yandera deposit study described here required a total of four AREA domains requiring separate interpolation runs to be carried out for each AREA of each domain for any given grade item.

For Kriging interpolation of the main CUPC1 item in each of the Yandera project areas, the interpolation runs utilised a minimum of 1 composite and up to a maximum of 24 composites depending on sample density to estimate each block. A maximum of three samples were allowed from each drill hole to help mitigate uni-directional bias.

The typical nugget, sill and range values derived from variography and subsequently used in the search ellipse dimension parameter encoding as well as the local orientation for each domain in the Yandera deposit are shown in Table 40. From a review of the spatial distribution statistics it was possible to assign specific 'nugget', 'sill' and search ellipsoid parameters for various mineralised domains. The same nugget and sill values were sometimes applied to peripheral domains as necessary where there was inherent lower composite density that prevented meaningful variograms from being developed. Also, in order to help produce robust semi-variograms, some merging of data from adjacent similar domains was carried out to increase the local composite population and thereby assist analysis. Several different designated AREA sub-domains were defined in order to optimally align search ellipse orientations.

Table 40 Yandera Project - General Search Variogram Search Ellipsoid Parameters (Used For MineSight - M624V1 Interpolation)										
	Kriging Parameters		Search Ellipse Geometry			Search Ellipse Dimensions			Outlier Limiting	
Domain (ZONEA) 1→7	Nugget	Sill (less nugget)	Azimuth	Plunge	Dip 'East' +ve W	Major axis (m)	Semi-Major Axis (m)	Minor axis (m)	Outlier cut-off (Cu %)	Distance (m)
ZONEA=1 AREA=1	0.0116	0.0030 0.0104 0.0072	300	+10	-88	151	110	50	1.1	44
ZONEA=1 AREA=2	0.0116	0.0030 0.0104 0.0072	305	-0	-88	151	110	50	1.1	44
ZONEA=1 AREA=3	0.0116	0.0030 0.0104 0.0072	10	-0	-88	151	110	50	1.1	44
ZONEA=1 AREA=4	0.0116	0.0030 0.0104 0.0072	305	-0	-88	151	110	50	1.1	44
ZONEA=2 AREA=1+2+4	0.0528	0.0056 0.0056 0.0054	300	+20	-88	151	110	50	1.1	44
ZONEA=3 AREA=1+2+4	0.0071	0.0100	310	-0	-88	151	110	50	1.0	44

Table 40 Yandera Project – General Search Variogram Search Ellipsoid Parameters (Used For MineSight – M624V1 Interpolation)

	Kriging Parameters		Search Ellipse Geometry			Search Ellipse Dimensions			Outlier Limiting	
Domain (ZONEA) 1→7	Nugget	Sill (less nugget)	Azimuth	Plunge	Dip 'East' +ve W	Major axis (m)	Semi-Major Axis (m)	Minor axis (m)	Outlier cut-off (Cu %)	Distance (m)
ZONEA=4 AREA=1+2+4	0.0251	0.0186	305	-0	-88	151	110	50	1.4	44
ZONEA=5 AREA=1	0.0116	0.0030 0.0104 0.0072	300	+10	-88	151	110	50	2.4	44
ZONEA=5 AREA=2	0.0116	0.0030 0.0104 0.0072	305	+10	-88	151	110	50	2.4	44
ZONEA=5 AREA=3	0.0116	0.0030 0.0104 0.0072	10	-0	-88	151	110	50	1.1	44
ZONEA=5 AREA=4	0.0116	0.0030 0.0104 0.0072	305	-0	-88	151	110	50	2.4	44
ZONEA=6 AREA=1+2+4	0.0528	0.0056 0.0056	300	+20	-88	134	110	50	2.2	44

Table 40 Yandera Project – General Search Variogram Search Ellipsoid Parameters (Used For MineSight – M624V1 Interpolation)										
	Kriging Parameters		**Search Ellipse Geometry**			**Search Ellipse Dimensions**			**Outlier Limiting**	
Domain (ZONEA) 1→7	**Nugget**	**Sill (less nugget)**	**Azimuth**	**Plunge**	**Dip 'East' +ve W**	**Major axis (m)**	**Semi-Major Axis (m)**	**Minor axis (m)**	**Outlier cut-off (Cu %)**	**Distance (m)**
		0.0054								
ZONEA=7 AREA=1+2+4	0.0071	0.0100	310	-0	-88	134	110	50	3.8	44

In addition to the grade items, a number of additional 'ancillary parameter' precursor classification items were also calculated and written to the block model. Such ancillary items include: 'distance to the closest composite' (DIST1), 'Kriging variance' (KERR1) and 'number of composites' available within a particular search ellipsoid to interpolate a block (COMP1). The values interpolated into these items are then 'condensed' to another 'classification' item (QLTY) which is then used as a guide to help with the formal reporting of mineralised resources. The values coded into these items are then 'condensed' to a 'RCAT' item which is then used as a guide to help with the formal reporting of mineralised resources as outlined by JORC (Dec 2004).

14.9 Assignment of Additional Block Item Values

Some block model material, or physical characteristic codes, are broadly assigned to assist resource reporting variables such as bulk density, oxidation state or rock type. These codes are usually assigned using a straight forward block-in / block-out assignment basis using the standard 50% split rule. The tables that follow describe the typical block-in / block-out integer codes used for material type coding within the various block models constructed for each of the deposit areas.

14.10 Assignment of Additional Block Item Values

Geology or material type data parameters are coded to the block model from wire-frames using a straight forward block-in / block-out assignment basis using the standard 50% split rule. The following table (Table 41) describes the typical block-in / block-out integer codes used for the Yandera Block Models..

Table 41 Block Model Parameter Summary Table - Yandera Deposit

Characteristic	Model Item	Description
Area Domains	AREA	Area domains used to define localised mineralisation geometry were coded into item **AREA** using the majority rule from Area domain solids. The whole resource block (10x10x10m) is given the code of the largest component of the block.
Weathering / Oxidation State Domains	OXID	Weathering / Oxidation state domains used to define localised material type characteristics. The whole resource block (10x10x10m) is given the code of the largest component of the block. This is also important to consider with respect to the assignment of bulk density. OXID=1 – Highly Weathered / Oxidised Zones OXID=2 – Moderately weathered / Partially oxidised Zones OXID=3 – Un-weathered and un-oxidised Fresh Rock / Sulphide (basement) Zones
Bulk Density	SG1	Bulk density was assigned to whole blocks on the basis of the previously assigned weathering / oxidation state coding (OXID). SG=2.20 – (For OXID=1) SG=2.40 – (For OXID=2) SG=2.60 – (For OXID=3)

14.10.1 Bulk Density

Marengo has collected 200 bulk density (specific gravity - SG) readings from drill core from 8 drill holes. Bulk densities have been calculated using a wax immersion Archimedes method whereby the weighing of samples in air and water is carried out to estimate the bulk density. The mean value from this data set is 2.58, with the minimum value 2.26 and maximum value 3.12.

Although densities appear to be relatively uniform this data-set is a little small. Ravensgate recommend the collection of another 300 or so measurements from drillholes which give a good 3D spread throughout the deposit and encompass all the known different mineralisation styles and oxidation states. Ravensgate understands that this programme is in progress.

14.10.2 Validation

Validation was carried out by:

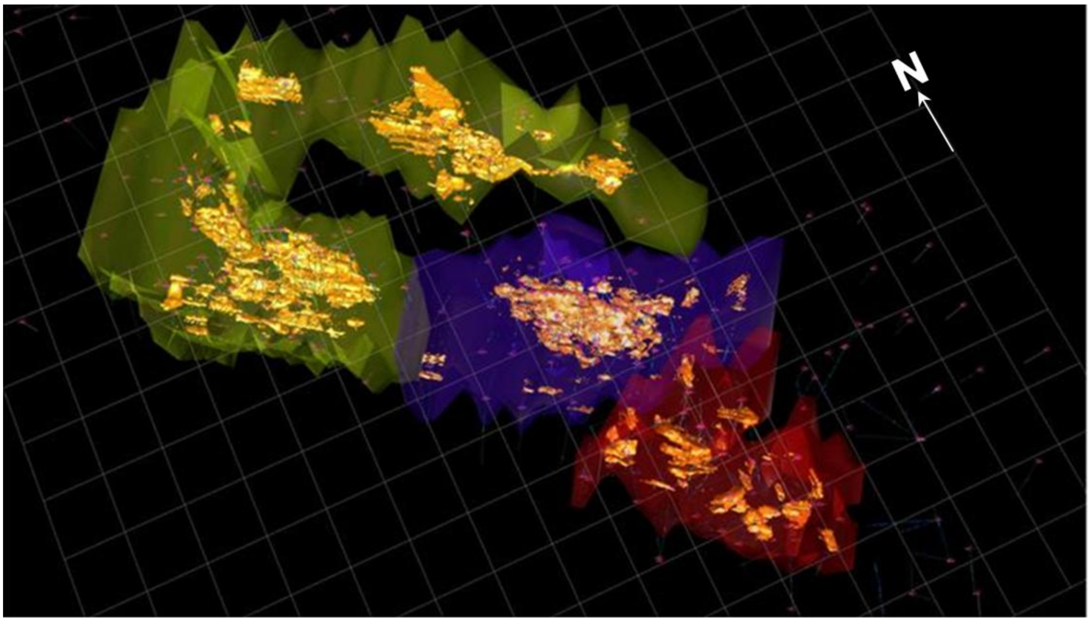
- Visual checking of interpolation in plan and section;
- Review of 'Quality of Estimate' data and associated confidence coding analysis - (Block Model QLTY Item);
- Comparison of input versus output statistics globally – (including 'De-Clustering' Analysis);
- Comparison with previous estimates.

The global (>0.50% Cu cut-off) model statistics were also carefully reviewed and were compared with input composite statistics. It was noted in general that for all domains, the estimated reported block model grades will generally be lower than the 'raw' composite grades. This is to be expected as the volume-variance effects of the Kriging interpolation based upon the local variography will normally show some expected variation when comparing grades from sample sized volumes to block volumes.

Further direct comparisons of the block grades on a bench by bench basis with the original 3m composite values was also carried out. These plots show the relative correlation of interpolated data with respect to interpolated block model data. Overall there is close correlation of composite versus model grades for the Cu, Mo and Au Items modelled. There is some small departure from 'strong' correlation' where the number of composite data points are relatively low, or in the outmost or peripheral parts of some of the mineralisation domain wire-frames. These graphs are presented for detailed review in the QAQC report authored by Karl Smith 2012 (Smith, 2012).

The following figure (Figure 33) displays the copper distribution above a 0.50% Cu lower cut-off as derived from the block model.

Figure 33 Mineral Resource Grade Shell Schematic from Block Model Depicting +0.50% Cu Mineralisation as at 12 April 2012 – Yandera Area Copper Deposit – Cu - Mineralisation – CU1PC Code (Copper %') Item (orange shell). (Transparent shells are original mineralisation delineation shell wire-frames – (ZONEA=1, 2 & 3)



**Oblique View - Azim Direction: 025 degrees, Dip: -75 degrees. – Grid size: 250x250m*

The Quality of Estimate (QLTY) item was also carefully reviewed in the block model particularly where relatively high Kriging variances were observed. This review was used to subsequently 'temper' or where necessary modify segments of the deposit with respect to resource classification.

Overall the observed changes in volume-variance in the block model for the new block models were not considered locally or globally to be problematic and was in line with expectations of grade distributions that would be derived from Ordinary Kriging given the available data-set containing relatively dense drilling. Any observed volume variance changes were generally observed to be volumetrically minor and any reported grade 'distortion' effects are probably more evident in the sparsely populated parts of the mineralisation domains. In all domains grades above an outlier cut-off grade are not allowed to influence the grade of blocks farther than 44 metres in distance.

14.10.3 Yandera Porphyry Copper Model Areas – Kriging Interpolation Methods Adopted and Block Model Review

The general approach to model interpolation was to carry out a sequential series of Kriging interpolation runs separately for each mineralised domain, with parameters 'tuned' for each element within a particular domain based on variography.

For the Yandera Deposit area it was possible to assign specific 'nugget' and 'sill' and search ellipsoid parameters for copper, molybdenum and gold element items. This was possible because there were quite robust 'down-hole' variograms available from almost all mineralisation domains in the Yandera deposit area. For some domains with less abundant sample numbers and thus less 'reliable' variograms it was necessary to use whatever data could be derived and to apply the parameters from the appropriate adjacent mineralisation domain. This approach, whilst not ideal, is an accepted compromise approach used by the resource modelling industry. The elements interpolated using the 'assumed' and 'adjacent Domain' variogram parameters are expected to have relatively higher kriging variances and are thus accounted for by the QLTY item used to influence the resource classification category at the resource reporting stage.

The number of available copper, molybdenum and gold analyses was quite large and consequently they tended to be relatively uniformly distributed as defined by the mineralisation shells developed by Marengo. Mineralisation definition was reasonably tightly constrained according to the presence of drilling data. As such any problems with peripheral Domain areas not being 'well informed' by local samples were generally minor and usually isolated to only a few locations: notably the North end of Imbruminda where the mineralisation changes in orientation as it wraps around the barren quartz zone.

The modelling and interpolation approach for copper, molybdenum and gold has been consistent for each element.

Table 42, Table 43 and Table 44 describe the 'univariate statistics' and 'non-localised' grade distribution of the main copper item contained within the resource block model derived after Ordinary Kriging interpolation using the available 3m 'down-hole' composites. The composite data-set used and all associated interpolation runs have been constrained within the mineralisation domains as modelled.

Table 42 Copper Item – Univariate Statistics from the Block Model 12 April 2012 – Yandera Deposit

Cu Mineralisation Only - Reported at variable copper lower cut-offs – ZONEA=1→7 (Reporting Cu Item = CUPC1)

Domains	Lower cut-off (Cu%)	Number of Model blocks	In-situ Grade Cu(%)	CV
ZONEA=1→7	0.1	777546	0.2269	0.679595
ZONEA=1→7	0.2	329306	0.3473	0.498704
ZONEA=1→7	0.3	164714	0.4564	0.411919
ZONEA=1→7	0.4	83865	0.5699	0.361291
ZONEA=1→7	0.5	44586	0.6847	0.329487
ZONEA=1→7	0.6	24210	0.8069	0.304499
ZONEA=1→7	0.7	14424	0.9206	0.284923
ZONEA=1→7	0.8	9285	1.0209	0.273876
ZONEA=1→7	1.0	3466	1.2783	0.245795
ZONEA=1→7	1.5	651	1.7913	0.203093
ZONEA=1→7	2.0	105	2.4224	0.211608
ZONEA=1→7	2.5	23	3.2448	0.165526
ZONEA=1→7	2.6	19	3.3921	0.138498
ZONEA=1→7	2.8	19	3.3921	0.138498
ZONEA=1→7	3.0	12	3.6708	0.098616
ZONEA=1→7	3.5	5	4.08	0.008309
ZONEA=1→7	4.0	5	4.08	0.008309

CV abbreviation for coefficient of variation

Table 43 Molybdenum Item - Univariate Statistics from the Block Model 12 April 2012 – Yandera Deposit *Mo Mineralisation Only -Reported at variable molybdenum lower cut-offs – ZONEB=1→9 (Reporting Mo Item = MOKR1)*				
Domains	**Lower cut-off Mo (ppm)**	**Number of Model blocks**	**In-situ Grade Mo (ppm)**	**CV**
ZONEB=1→9	5	699836	65.03	1.30
ZONEB=1→9	10	657906	68.72	1.25
ZONEB=1→9	15	599426	74.25	1.18
ZONEB=1→9	20	532339	81.47	1.11
ZONEB=1→9	25	471834	89.10	1.05
ZONEB=1→9	30	419885	96.80	1.00
ZONEB=1→9	40	336238	112.36	0.91
ZONEB=1→9	50	280482	125.88	0.85
ZONEB=1→9	60	238315	138.57	0.80
ZONEB=1→9	70	203644	151.22	0.76
ZONEB=1→9	80	173976	164.30	0.73
ZONEB=1→9	90	149052	177.66	0.70
ZONEB=1→9	100	127801	191.49	0.68
ZONEB=1→9	150	59377	273.27	0.56
ZONEB=1→9	200	35670	341.97	0.48
ZONEB=1→9	250	24901	392.97	0.44
ZONEB=1→9	300	17295	445.10	0.41

CV abbreviation for coefficient of variation

Table 44 Gold Item - Univariate Statistics from the Block Model 12 April 2012 – Yandera Deposit *Au Mineralisation Only - Reported at variable gold lower cut-offs – ZONEC=1→10 (Reporting Au Item = AUKR1)*				
Domain	**Lower cut-off Au (ppm)**	**Number of Model blocks**	**In-situ Grade Au (ppm)**	**CV**
ZONEC=1→10	0.02	598813	0.07	1.26
ZONEC=1→10	0.05	279132	0.11	0.99
ZONEC=1→10	0.10	108278	0.18	0.81
ZONEC=1→10	0.20	23834	0.35	0.69
ZONEC=1→10	0.25	13272	0.45	0.62
ZONEC=1→10	0.27	11113	0.49	0.60
ZONEC=1→10	0.30	8925	0.54	0.56
ZONEC=1→10	0.40	4486	0.74	0.44
ZONEC=1→10	0.50	3030	0.88	0.34
ZONEC=1→10	0.60	2373	0.97	0.28
ZONEC=1→10	0.70	1711	1.11	0.17
ZONEC=1→10	0.80	1486	1.16	0.12
ZONEC=1→10	0.90	1372	1.19	0.09
ZONEC=1→10	0.99	1318	1.20	0.08
ZONEC=1→10	0.02	598813	0.07	1.26
ZONEC=1→10	0.05	279132	0.11	0.99
ZONEC=1→10	0.99	108278	0.18	0.81

CV abbreviation for coefficient of variation

14.11 Resource Classification

14.11.1 Resource Classification – Underlying Methodology

The resource classification was carried out using a 'quality' of estimate approach which reflected the distance from a block to drill composites (DIST), the number of composites used to estimate the block (COMPS) and Kriging variance (KERR1).

The available DIST, COMPS and KERR items were analysed from a probability statistics standpoint and a selection of ranges were incorporated into a series of MineSight® M612V1 subroutine calculations to determine values for a new item called CONF which in turn was re-condensed into a final 'reporting item' called QLTY. Table 45 below summarises the assessment criteria used globally for model blocks in the main mineralisation domains.

Table 45 Yandera Area - QLTY item Classification Code Calculation Parameters

Distance (DIST1) to nearest Composite (m)	Number of Composites used Range (COMP1)	Kriging 'Variance' (KERR1)	Mineralisation Domain (ZONE)	~QLTY
0-75	>15	0.0-0.04	ZONEA=1→7	1
75-130	11-15	0.04-0.06	ZONEA=1→7	2
130-160	<10	>0.06	ZONEA=1→7	3
>160	NA	NA	ZONEA=1→7	4

The final quality parameter (QLTY) was used for tabulating the 'un-biased' relative resource tonnages and grades for the block models in the Yandera Project area. Table 45 and Table 46 summarises the 'In-Situ' resource categories derived for the main reporting copper item CUPC1 for the Yandera deposit. A graphical representation of the resource categories is shown in Figure 34. Ravensgate has elected to include the "QLTY-4" or "Low Q" Inferred material as Inferred material as per the guidelines of the JORC Code. This is considered appropriate as this material, whilst not well informed by drill holes in the local vicinity is clearly constrained within the existing 3-D wire-frames, and is reasonable to expect that in these locations that the same tenure of grade will be encountered when future planned "in-fill" drilling is carried out in these locations.

Table 46 Block Model Material Confidence Summary 12 April 2012 – Yandera Area Copper Deposit – Cu Mineralisation – By QLTY ('Quality Of Estimate') Item

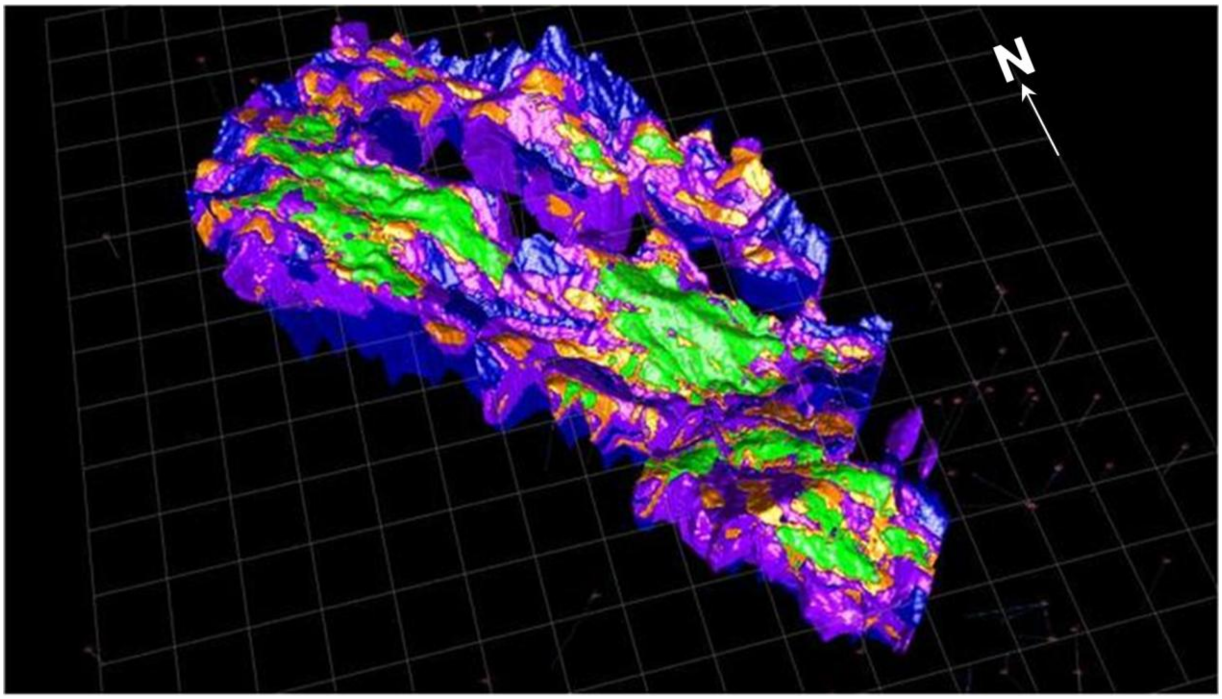
QLTY=1 - High, QLTY=2 - Medium, QLTY=3 - low and QLTY=4 – 'Very Low Q'. Report at 0.50% Cu lower cut-off. (Base Report Item Cu% = CUPC1 – Within ZONEA=1→7 Domains) Material Summary Strictly Unclassified

Resource Category Confidence	*QLTY Level*	*Lower cut-off (Cu%)*	*Volume Mm^3*	*In-situ Tonnes (Mt)*	*In-situ Grade (Cu%)*	*Contained Metal (Cu) (kTonnes)*
'High'	*QLTY=1*	0.50	24	62	0.68	418
'Medium'	*QLTY=2*	0.50	9	23	0.74	172
'Low'	*QLTY=3*	0.50	10	25	0.65	165
'Very Low Q'	*QLTY=4*	0.50	1	3	0.65	18

Note: M is an abbreviation for million, k is an abbreviation for kilo

The graphical representation of the resource categories shown in Figure 34 demonstrates that the search ellipsoids used in interpolation have not significantly affected resource classification which is still affected mostly by the drilling density. Measured and Indicated resource category areas are broadly those that are contained within relatively densely drilled areas with (150-200m centres). Inferred Resources tend to be assigned to areas where drilling density has a 200-400m spacing or greater.

Figure 34 Mineral Resource Schematic Visual Representation of QLTY confidence Codes as at 12 April 2012 – Yandera Area Copper Deposit - Cu- Mineralisation – By QLTY ('Quality of Estimate') Item. QLTY=1 – High (green), QLTY=2 – Medium (orange), QLTY=3 – low (purple) and QLTY=4 – 'Very Low Q' (blue).



**Oblique View - Azim Direction: 015 degrees, Dip : -60 degrees. – Grid size : 250x250m*

14.11.2 Resource Classification Parameters – Yandera Deposit Area

The final quality parameter (QLTY) was used to classify resources using the 'RCAT' item for tabulating the 'un-biased' relative resource tonnages and grades for the block model.

Ravensgate has elected to classify material designated as QLTY=1 as Measured Resources, QLTY=2 material as Indicated Resources and QLTY=3 material as Inferred Resources. Ravensgate has also elected to combine the Low quality (QLTY=4) material into the Inferred category. Table 47, Table 48 and Table 49 below describe the final determined resource category for the copper, molybdenum and gold domains reported separately. These are designated as ZONEA=1→7 for copper, ZONEB=1→9 for molybdenum and ZONEC=1→10 for gold. The resource summaries and categories as derived are based upon the classification parameters derived from the copper reporting item CUPC1. It is stressed that these tables are reported independently based upon the lower cut-off given for each particular reporting element only. It is important to note that the molybdenum and gold domains are almost completely contained within the 'priority' copper reporting domains ZONEA=1→7 and therefore are mostly a subset of the reported copper resources.

The minor amount of residual Mo and Au mineralisation outside the priority copper domain mineralisation shells has been designated as QLTY=3 (Inferred) material only at this time. The priority Cu item and associated Cu interpolation parameters and resource classification codes have been used to classify the Mo and Au mineralised resources. It should be noted that the resources reported below in each table are all contained within the copper mineralisation domains and are not to be accumulated. Figure 18, Figure 19 and Figure 20 show graphically the relative geometric location extent of the Cu, Mo and Au domains respectively.

Table 47 Summary of Yandera – 12 April 2011 OK Model Resource at varying Cu (%) Lower cut-off Levels – ZONEA=1→7 (Cu) Zones Only - (CUPC1 Block Model Reporting Item)

	Measured Resource					Indicated Resource					Inferred Resource				
Cu% Cut-Off	Volume m^3	Tonnes (Mt)	Cu (%)	Mo (ppm)	Au (ppm)	Volume Mm^3	Tonnes (Mt)	Cu (%)	Mo (ppm)	Au (ppm)	Volume Mm^3	Tonnes (Mt)	Cu (%)	Mo (ppm)	Au (ppm)
0.10	216	548	0.28	85.2	0.070	178	453	0.22	40.3	0.035	376	963	0.20	28.1	0.02
0.20	124	314	0.38	104.6	0.085	67	172	0.35	52.7	0.048	135	347	0.31	37.8	0.03
0.25	97	248	0.43	113.7	0.092	45	114	0.42	58.2	0.054	85	218	0.37	41.8	0.03
0.27	88	225	0.45	117.1	0.095	38	98	0.44	60.2	0.056	72	185	0.39	42.1	0.04
0.30	76	192	0.48	122.8	0.099	31	81	0.48	63.2	0.059	56	144	0.42	41.9	0.04
0.40	44	111	0.57	140.3	0.111	16	42	0.60	72.3	0.069	23	59	0.54	49.7	0.05
0.50	24	62	0.68	152.7	0.122	9	23	0.74	79.4	0.077	11	28	0.65	58.3	0.06
0.60	13	34	0.79	162.7	0.132	5	14	0.87	70.5	0.077	5	13	0.78	30.8	0.05
0.70	8	20	0.90	170.7	0.136	3	9	1.00	65.1	0.086	3	8	0.88	25.7	0.05
0.80	5	12	1.01	173.9	0.142	3	7	1.10	61.5	0.094	2	5	0.94	17.7	0.06
1.00	2	4	1.24	162.2	0.145	1	3	1.37	69.3	0.080	0.5	1	1.22	29.1	0.05

Note: M is an abbreviation for million

Table 48 Summary of Yandera – 12 April 2011 OK Model Resource at varying Mo (ppm) Lower cut-off Levels – ZONEB=1→9 (Mo) Zones Only - (MOKR1 Block Model Reporting Item)

	Measured Resource			Indicated Resource			Inferred Resource		
Mo(ppm) Cut-Off	Volume Mm^3	Tonnes (Mt)	Mo (ppm)	Volume Mm^3	Tonnes (Mt)	Mo (ppm)	Volume Mm^3	Tonnes (Mt)	Mo (ppm)
20	194	494	100.3	116	298	71.0	286	737	58.1
30	162	414	114.9	89	228	85.4	220	567	71.2
40	138	354	128.7	69	178	99.8	167	431	86.0
50	122	313	139.6	57	146	112.3	127	328	102.2
60	109	279	150.0	47	120	124.7	100	259	117.6
70	97	248	160.7	39	100	136.8	82	211	132.2
80	85	218	172.4	33	84	149.0	67	173	146.9
90	74	190	185.4	27	70	161.2	56	143	162.0
100	64	164	199.9	23	59	174.1	47	121	176.3
150	30	77	289.1	10	25	248.6	40	104	189.4
200	18	47	364.7	5	13	320.9	20	51	262.8

Note: M is an abbreviation for million

Table 49 Summary of Yandera – 12 April 2011 OK Model Resource at varying Au (ppm) Lower cut-off Levels – ZONEC=1→10 (Au) Zones Only – (AUKR1 Block Model Reporting Item)									
	Measured Resource			Indicated Resource			Inferred Resource		
Au(ppm) Cut-Off	Volume Mm^3	Tonnes (Mt)	Au (ppm)	Volume Mm^3	Tonnes (Mt)	Au (ppm)	Volume Mm^3	Tonnes (Mt)	Au (ppm)
0.10	62	155	0.17	17	44	0.18	7	17	0.48
0.20	13	33	0.28	4	10	0.34	4	10	0.67
0.27	5	13	0.37	2	5	0.45	3	9	0.71
0.30	4	9	0.41	2	4	0.48	2	6	0.91
0.40	1	3	0.54	0.9	2	0.61	2	5	1.01
0.50	0.6	2	0.67	0.6	1	0.70	2	4	1.05
0.60	0.3	0.8	0.78	0.3	0.9	0.80	1	4	1.16
0.70	0.2	0.5	0.88	0.2	0.4	0.98	1	3	1.18
0.80	0.1	0.3	0.99	0.1	0.3	1.11	1	3	1.20
1.00	0.04	0.1	1.17	0.07	0.2	1.29	0.01	0.03	1.71

Note: M is an abbreviation for million

14.12 Mineral Resource Statement

This estimate and reporting of identified mineral resources has been undertaken in accordance with the mineral resource reporting guidelines as outlined in The Australasian Code for the Reporting of Identified Mineral Resources and Ore Reserves – (JORC) – (2004).

The JORC Code outlines a range of assessment criteria dependent on the quality of several important data inputs. The most important of these inputs are related to factors that include, amongst others, the following:

- Adequate levels of drilling and sample density;
- Precise drilling and sampling technique;
- Regular checking of assay data quality;
- Adequate survey control for drill holes and sample points;
- Reliable estimation and allowance for variability of specific gravity;
- Consistent and accurate logging of drill hole data;
- Precise definition and modelling of mineralisation zones with reference to geology;
- Thorough reviews of deposit statistics;
- Realistic application of grade cut-offs and area of influence restrictions;
- Correct application of interpolation techniques;
- Thorough analysis of all modelling parameters and the results derived; and
- The minimisation of all assumptions where possible.

The main body and comments of this report have been presented to outline the extent to which the above factors and criteria have been considered. In addition, any assumptions made relating to the scope of this work have been clearly identified wherever possible.

The following tables (Table 50, Table 51 and Table 52) describe the reported resource tonnages and grades at a selected range of copper lower cut-off grades.

Table 51 is a total resource summary of all mineralised and classified material. The resources summarised in Table 50 are included in those shown in Table 51.

Table 50 Resource Summary - Yandera Deposit Area - Measured Resources as at 12 April 2012 at Varying Lower Cut-Off Grades (OK Block Model) Reporting Item CUPC1 - ZONEA=1→7 Zones Only

Lower Cut-off CUPC1	Measured Resources		
	Volume (Mm^3)	Tonnes (Mt)	Cu(%)
0.20% Cu	124	314	0.38
0.30% Cu	76	192	0.48
0.40% Cu	44	111	0.57
0.50% Cu	24	62	0.68
0.70% Cu	8	20	0.90
0.80% Cu	5	12	1.01
1.00% Cu	2	45	1.24

Note M is an abbreviation for million

Table 51 Resource Summary – Yandera Deposit Area – Indicated Resources as at 12 April 2012 at Varying Lower Cut-Off Grades (OK Block Model) Reporting Item CUPC1 - ZONEA=1→7 Zones Only			
Lower Cut-off CUPC1	**Indicated Resources**		
	Volume (Mm³)	**Tonnes (Mt)**	**Cu(%)**
0.20% Cu	67	172	0.35
0.30% Cu	31	81	0.48
0.40% Cu	16	42	0.61
0.50% Cu	9	23	0.74
0.70% Cu	3	9	1.01
0.80% Cu	3	7	1.10
1.00% Cu	1	3	1.37

Note M is an abbreviation for million

Table 52 Resource Summary – Yandera Deposit Area – Inferred Resources as at 12 April 2012 at Varying Lower Cut-Off Grades (OK Block Model) Reporting Item CUPC1 - ZONEA=1→7 Zones Only			
Lower Cut-off CUPC1	**Inferred Resources**		
	Volume (Mm³)	**Tonnes (Mt)**	**Cu(%)**
0.20% Cu	135	347	0.31
0.30% Cu	56	144	0.42
0.40% Cu	23	59	0.54
0.50% Cu	11	28	0.65
0.70% Cu	3	8	0.88
0.80% Cu	2	5	0.94
1.00% Cu	0.5	1	1.22

Note M is an abbreviation for million

The following tables (Table 53 to Table 58) describe the reported resource tonnages and grades at a selected range of copper lower cut-off grades which are also subdivided by particular Yandera Project named reference area.

Table 53 Yandera Measured and Indicated Mineral Resource as of 12 April 2012 - (Based on ZONEA=1→7 Only)					
Area	**Cu cut-off grade %**	**Tonnes (Mt)**	**Cu %**	**Mo ppm**	**Au ppm**
Imbruminda	0.2	252	0.38	66.8	0.09
Gremi	0.2	145	0.38	130.8	0.07
Omora	0.2	89	0.34	69.0	0.04
All Other	0.2	-	-	-	-
Total	**0.2**	**486**	**0.37**	**86.3**	**0.07**

Note: M is an abbreviation for million

Table 54 Yandera Inferred Mineral Resource as of 12 April 2012 - (Based on ZONEA=1→7 Only)					
Area	**Cu cut-off grade %**	**Tonnes (Mt)**	**Cu %**	**Mo ppm**	**Au ppm**
Imbruminda	0.2	182	0.33	32.7	0.04
Gremi	0.2	116	0.30	48.0	0.02
Omora	0.2	48	0.28	32.8	0.01
All Other	0.2	-	-	-	-
Total	**0.2**	**347**	**0.31**	**37.8**	**0.03**

Note: M is an abbreviation for million

Table 55 Yandera Measured and Indicated Mineral Resource as of 12 April 2012 - (Based on ZONEA=1→7 Only)					
Area	**Cu cut-off grade %**	**Tonnes (Mt)**	**Cu %**	**Mo ppm**	**Au ppm**
Imbruminda	0.3	145	0.48	78.5	0.10
Gremi	0.3	91	0.47	150.4	0.08
Omora	0.3	36	0.49	99.1	0.05
All Other	0.3	-	-	-	-
Total	**0.3**	**273**	**0.48**	**105.2**	**0.09**

Note: M is an abbreviation for million

Table 56 Yandera Inferred Mineral Resource as of 12 April 2012 - (Based on ZONEA=1→7 Only)					
Area	**Cu cut-off grade %**	**Tonnes (Mt)**	**Cu %**	**Mo ppm**	**Au ppm**
Imbruminda	0.3	84	0.44	41.1	0.05
Gremi	0.3	46	0.38	46.4	0.03
Omora	0.3	14	0.40	32.2	0.01
All Other	0.3	-	-	-	-
Total	**0.3**	**144**	**0.42**	**41.9**	**0.04**

Note: M is an abbreviation for million

Table 57 Yandera Measured and Indicated Mineral Resource as of 12 April 2012 - (Based on ZONEA=1→7 Only)					
Area	**Cu cut-off grade &**	**Tonnes (Mt)**	**Cu %**	**Mo ppm**	**Au ppm**
Imbruminda	0.4	44	0.71	96.2	0.13
Gremi	0.4	51	0.56	171.8	0.09
Omora	0.4	21	0.60	127.2	0.06
All Other	0.4	-	-	-	-
Total	**0.4**	**153**	**0.58**	**121.7**	**0.10**

Note: M is an abbreviation for million

Table 58 Yandera Inferred Mineral Resource as of 12 April 2012 - (Based on ZONEA=1→7 Only)					
Area	**Cu cut-off grade %**	**Tonnes (Mt)**	**Cu %**	**Mo ppm**	**Au ppm**
Imbruminda	0.4	41	0.55	50.3	0.06
Gremi	0.4	13	0.51	53.5	0.04
Omora	0.4	5	0.53	36.1	0.01
All Other	0.4	-	-	-	-
Total	**0.4**	**59**	**0.54**	**49.8**	**0.05**

Table 59 below shows additional detail with respect to describing the Measured, Indicated and Inferred Resources for Yandera separately at a 0.2% Cu lower cut-off.

Table 59 Yandera Measured and Indicated Mineral Resource as of 12 April 2012 - (Based on ZONEA=1→7 Only)

Classification	Area	Cu cut-off grade %	Tonnes (Mt)	Cu %	Mo ppm	Au ppm
Measured	Imbruminda	0.2	147	0.38	78.3	0.104
Measured	Gremi	0.2	119	0.40	143.8	0.076
Measured	Omora	0.2	48	0.37	88.1	0.049
Measured	Other	0.2	-	-	-	-
Measured	**Total**	**0.2**	**314**	**0.38**	**104.6**	**0.085**
Indicated	Imbruminda	0.2	105	0.38	50.7	0.060
Indicated	Gremi	0.2	26	0.31	70.6	0.038
Indicated	Omora	0.2	41	0.31	46.5	0.025
Indicated	Other	0.2	-	-	-	-
Indicated	**Total**	**0.2**	**172**	**0.35**	**52.7**	**0.048**
Measured and Indicated	Imbruminda	0.2	252	0.38	66.8	0.086
Measured and Indicated	Gremi	0.2	145	0.38	130.8	0.069
Measured and Indicated	Omora	0.2	89	0.34	69.0	0.038
Measured and Indicated	Other	0.2	-	-	-	-
Measured and Indicated	**Total**	**0.2**	**486**	**0.37**	**86.3**	**0.072**

Note M is an abbreviation for million

The following figure (Figure 35) shows a typical schematic long section view of part of the Imbruminda Area (left) and the Gremi Area (right) showing the proximity of copper mineralisation in relation to topographic surface. The red contours represent +0.4% Cu and the pink contours represent +0.5% Cu.

Figure 35 Yandera Long Section Schematic derived from Block Model Grade Shell Contours Depicting +0.4% (red) and +0.5% (magenta) Cu Mineralisation contours in conjunction with surface topography profile - as at 12 April 2012 (view direction approximately North-East)

14.13 Comparison to Previous Resource Estimates – Yandera Area

The comparison of the Ravensgate April 2012 mineral resource estimate with the previous most recent mineral resource reported by Golder in April of 2011 is presented in Table 60 and Table 61 below. A direct comparison between these two is not possible because Golder used a copper equivalent cut-off grade and Ravensgate does not. Ravensgate deems the use of a copper equivalence grade as a cut-off to report resources to be problematic because metal prices, along with many other factors, must be chosen and, once chosen, the metal price is fixed regardless of how metal prices change over time. The result is that comparing mineral resources over time becomes difficult because price, and thus the proper formula to reach a copper equivalent grade, does vary over time.

The one fact that is common to all mineral resources is that as total tonnage changes the grade will also change. Therefore, for the purposes of comparison with the Golder resource estimate, Ravensgate has chosen a copper cut-off grade that produces a total Measured and Indicated tonnage that is close to the Golder reported resource summary at a 0.3% copper equivalent cut-off grade. For this comparison, the Ravensgate data also shows total measured and indicated tonnage because new drilling has allowed some of the previously defined mineralisation to be upgraded from a lower to a higher category, with inferred to indicated being an example.

Table 60 ***Yandera - Comparison to previous Resource Estimates (using Lower Cut-Off of 0.25% Cu) – Measured + Indicated Resources***

Yandera	Cut-off	Measured		Indicated		Total Measured+ Indicated	
		Tonnes (Mt)	Cu(%)	Tonnes (Mt)	Cu(%)	Tonnes (Mt)	Cu(%)
Current Ravensgate Model (April 2012)	0.25% Cu[1]	248	0.429	114	0.417	361	0.425
Previous Golder Model (April 2011)	0.30% CuEq[2]	113	0.398	245	0.347	359	0.363
Difference	(Actual)	+135	+0.031	-131	+0.07	+2	+0.062
% Difference	(%Diff)	+119.47%	+7.79%	-53.47%	+20.17%	+0.56%	17.08%

1) Ravensgate does not use copper equivalent grade for reporting
2) The copper equivalent calculation used by Golder in April 2011 was CuEq = (Cu% + (Mo% × 10))

Table 61 ***Yandera –Comparison to previous Resource Estimates (using Lower Cut-Off of 0.25% Cu) - Inferred Resources***

Yandera	Cut-off	Inferred	
		Tonnes (Mt)	Cu(%)
Current Ravensgate Model (April 2012)	0.25% Cu	218	0.368
Previous Golder Model (April 2011)	0.30% CuEq*	417	0.384
Difference	(Actual)	-199	-0.016
% Difference	(%Diff)	-47.72%	-4.17%

1) Ravensgate does not use Copper Equivalent Grade for Reporting
2) The copper equivalent used by Golder in April 2011 was CuEq = (Cu% + (Mo% × 10))

15. MINERAL RESERVE ESTIMATES

Nothing to report because no relevant data is available at this time.

16. MINING METHODS

Mining is intended to be by open cut operation with the waste dump, located in the nearby Tai-yor River Valley, also serving to contain the thickened tailings.

Preliminary studies have indicated that diesel powered operation is preferable to electric power for the excavators. It is possible that the extreme topography might require the adoption of semi-mobile pit edge primary crushing for both feed and waste with both subsequently being conveyed to the crushed material stockpile and waste dump area respectively.

The alternatives of Owner operated and Contractor mining are under consideration.

17. RECOVERY METHODS

17.1 Process Development

Testwork completed to date (refer Section 12) provides an appreciable level of confidence regarding the crushing and grinding characteristics of the feed, but only less information about flotation and extraction of the final products. Bulk flotation performance of the main feed types has been demonstrated in the current metallurgical testwork programme, but further progress is required prior to definitive reporting of the results and finalisation of the process design. As such, the following section describes the preliminary process selection and major equipment descriptions considered appropriate at the time of writing and may be modified on the basis of ongoing metallurgical testwork and process design activities.

17.2 Process Flowsheet Summary

In general, the preliminary process flowsheet consists of:

- Primary gyratory crushing and transfer to a 16 hour live capacity coarse ore stockpile (COS).
- Primary crushed feed reclaim to twin, parallel, single stage SAG (semi-autogenous grinding) milling and hydrocyclone classification circuits for grinding to a product size of 80% passing 150 microns (P80 of 150 µm).
- Rougher/scavenger flotation, bulk concentrate regrind and copper (Cu) cleaner flotation for the production of a cleaned copper, molybdenum (Mo) and gold (Au) concentrate.
- Cu/Mo concentrate regrind and separation of a Mo concentrate via a Mo roughing and multi-stage cleaning flotation circuit, with that circuit tail stream representing a final Cu concentrate.
- Rougher magnetic separation of the flotation tails followed by regrind, cleaner magnetic separation and reverse flotation of a magnetite concentrate.
- Separate transfer of Cu and magnetite concentrates via a slurry pipeline to a filtration and bulk concentrate storage facility at Madang.
- Shiploading facility for the loading of the bulk, filtered Cu and magnetite concentrates.

- Thickening, filtration, bagging and containerisation of the Mo concentrate for road transport to Lae.
- Tailings thickening and disposal to an integrated tailings disposal and mine waste storage facility.
- Reagent preparation and distribution facilities.
- Services including water supply and reticulation, air supply and reticulation and grinding media storage and loading equipment.

17.3 Process Description

The following section describes a potential process plant configuration pending assessment of the current metallurgical testwork programme results and process design verification. Given the size of the resource, a preliminary annual feed rate of 25 million tonnes has been chosen as a working figure.

The following conceptual flowsheet and equipment sizing has been undertaken to identify the likely size of the installation and explore how it could be installed in the restricted areas suitable for plant construction. This has enabled a more meaningful analysis of the options for total project configuration and also has facilitated discussions with the authorities and the local community about the potential project impacts.

17.3.1 Primary Crushing and Stockpiling

Run-of-mine (ROM) feed to the process plant would be via direct truck dumping with provision of a relatively small ROM pad to cover short term loss of mine feed. The concentrator would be thus configured to deal with the expected range of feed types and characteristics without reliance on blending for satisfactory performance.

Feed would be direct dumped from 280 tonne trucks to the primary crusher, a 60” gyratory unit. At an assumed primary crushing circuit availability/utilisation of 60%, the design average throughput rate for this circuit would be 4,756 tph and a design maximum throughput of 6,000 tph would be selected. The primary crusher feed area would be also equipped with a fixed rock breaker for treatment of large rocks.

Primary crusher product would be discharged to a COS feed conveyor which operates as a combined feeder/conveyor at a design maximum throughput of 7,500 tph.

Primary crushed feed would be discharged to a single point discharge, conical COS equipped with a three point discharge reclaim tunnel. The stockpile has a live capacity of 16 hours of feed and may be increased to an overall storage equivalent of around 72 hours by pushing in of the dead section of the COS by bulldozer or similar. Provision of a fixed cover for the COS would be not considered necessary as the crushed feed would be usually damp and minimal dust emissions are anticipated.

Primary crushed feed would be reclaimed from the COS via three pairs of vibrating feeders arranged to minimise arching and bridging of the stockpile material. The crushed feed would be directed from the feeders to a SAG mill feed system at a controlled feed rate.

17.3.2 Grinding and Classification

The function of the grinding and classification circuit would be to grind primary crushed feed to a P80 size of 150 µm at an average annual capacity of 25 Mtpa. There is sufficient flotation testwork completed to date to indicate that primary grind sizes less than P80 of 180µm achieve very good recovery of valuables to a bulk rougher concentrate and a design primary P80 grind size of 150µm would be selected.

Twin parallel grinding trains are required for single stage SAG milling at a circuit availability of 8,000 h/a, equivalent to an average throughput of 3,125 t/h. The SAG Mills would be approximately 12.2 m (40 ft) in diameter, around 9 m long and equipped with 28 MW wrap-around variable speed drives.

SAG mill discharge would be screened, with trommel oversize recirculated to the SAG mill feed system. A layout allowance would be provided for the retrofitting of pebble crushers into these systems should additional throughput be warranted in future. Self-cleaning magnets are installed on these transfer conveyors to remove undersize grinding media from the pebble streams.

The trommel undersize streams are introduced to the hydrocyclone classification system via separate cyclone feed pumps for each circuit. Cyclone clusters are equipped with fifteen 660 mm hydrocyclones, of which twelve are expected to be required under design operating conditions.

17.3.3 Rougher-Scavenger Flotation

Testwork results reported to date indicate very good Cu and Mo, good Au and, to a lesser extent, Ag (silver) recoveries can be obtained to a bulk rougher-scavenger concentrate at a P80 size of 150 µm for the hypogene feed types. Cyclone overflow from each grinding and classification circuit would be directed to separate rougher-scavenger flotation trains. Each train would be installed with an agitated conditioning tank for the addition of collector and other reagents as required. Conditioned flotation feed slurry gravitates to a series of rougher-scavenger forced aeration flotation cells with a total capacity of approximately 1,800 m^3, ie: nominal six x 300 m^3 tank cells/train (or equivalent).

Bulk concentrate would be transferred to the bulk concentrate regrind and Cu cleaning circuit as described in Section 17.3.4. The combined rougher-scavenger flotation tailing stream would be directed to the magnetite separation circuit as described in Section 17.3.6.

17.3.4 Bulk Concentrate Regrind and Cu Cleaning Flotation

Bulk flotation concentrate (approximately 4% weight or 125 tph) would be collected and directed to a regrind and classification circuit for grinding to a nominal P80 size of approximately 60 µm (to be confirmed - TBC). Regrinding mill(s) may be either of the conventional ball or vertical stirred type, depending on the final selected regrind size, as would the final number of mills required.

Reground bulk concentrate from each circuit would be combined for conditioning prior to Cu/Mo cleaning flotation. At this stage, it is envisaged that a 2-stage cleaning circuit would be required, perhaps with the incorporation of a cleaner scavenger circuit.

17.3.5 Cu Concentrate Regrind and Mo Flotation

Cleaned Cu/Mo concentrate would be further reground to a P80 size of approximately 38 µm via a vertical stirred mill (pending confirmation of regrind size) and transferred to a Mo flotation conditioning tank. Conditioned, reground Cu/Mo concentrate would be subjected to Mo separation flotation with the Mo rougher tail stream representing final Cu concentrate. Mo rougher concentrate would be further cleaned in a Mo cleaning circuit of up to 7 stages.

17.3.6 Magnetite Separation

Rougher-scavenger flotation tail would be subjected to primary magnetic separation via a bank of twenty five (TBC) single drum LIMS (low intensity magnetic separation) units operating in parallel. Primary magnetite concentrate (at approximately 50 tph) would be reground to approximately 40 µm (TBC) in a vertical stirred mill (or similar) prior to secondary magnetic separation. It would be envisaged that the secondary magnetic separation concentrate would be then subjected to reverse flotation for silica removal as required.

17.3.7 Concentrate Dewatering, Handling and Shipment

Production of copper concentrate and magnetite product would be expected to total approximately 400,000 tpa and be shipped in bulk from storage and loading facilities at Madang, around 150 km from the Yandera process plant. Production of molybdenum concentrate would be approximately 2,500 tpa and be shipped in containerised bulka bags.

Copper and magnetite concentrates would be separately thickened at the Yandera site prior to batch transfer to the Madang facility via a concentrate pumping and pipeline system. Both these concentrates would be discharged to agitated storage tanks at the Madang facility prior to filtration via vertical plate filters.

Provision would be allowed for the storage of approximately 60,000 tonnes of each bulk concentrate in single discharge point, covered, conical stockpiles. Bulk concentrate reclaim would be by front end loader (FEL) onto the ship loading conveyor system at up to approximately 4,500 tph.

The molybdenum concentrate would be thickened and filtered at the Yandera site prior to bagging, containerisation and periodic road delivery to the Madang facility.

17.3.8 Tailings Disposal

The magnetite separation tail stream (refer Section 17.3.6) would be thickened to approximately 55% to 60% solids (w/w) slurry density via a nominal 65 m diameter high rate thickener. Tails thickener overflow would report to the process water system whilst the underflow stream would be directed to the integrated tails storage facility.

17.3.9 Reagents

Reagent preparation systems include facilities for receipt and storage of delivered reagents, mixing and storage of mixed reagents (as required) and distribution systems for:

- Flocculant for the tailings and Cu, Mo and magnetite thickening systems.
- Collectors, frother and any other conditioning reagents required for bulk, Cu cleaning and Mo separation/cleaning flotation circuits (TBC).
- Collector and depressant for reverse flotation of oxides from the secondary magnetite separation concentrate stream (if necessary).

The reagent preparation and delivery systems would have spare capacity to accommodate a single additional reagent to the design suite to provide flexibility in handling different feed blends and testing of new reagents.

Grinding media storage and loading systems are provided for the SAG milling and regrinding circuits as appropriate.

17.3.10 Services

Provision of the following services to the Yandera process plant:

- Low pressure air for each of the flotation duties.
- High pressure air for general purpose supply and filtering and drying for instrument air supply and distribution.
- Process water system for all general processing requirements, predominantly supplied from the thickener overflow streams and as tailings disposal facility return water and directed to the milling and flotation circuit slurry streams.
- Raw water system for process water make-up (as required), equipment cooling duties, gland water supply, reagent preparation and potable water production.
- Potable water treatment plant with storage and distribution to ablutions, safety showers, etc.

The Madang facility would be provided with a high pressure air system for use by the concentrate filters. In addition, a water treatment plant would be installed for treatment of the concentrate filtration filtrate streams prior to disposal.

17.4 Concentrator Design

17.4.1 Design Production Basis

The main production criteria developed for the Yandera concentrator design (pending verification from the current metallurgical testwork programme) are presented as Table 62.

Table 62 Concentrator Main Design Production Criteria

Design Criteria Parameter	Unit	Value	Comments
Annual Throughput	Mtpa	25	Average
General Operating Schedule	hpd - dpa	24 - 365	Continuous operation
Primary Crushing Operating Time	hpa	5 256	60% utilisation
Primary Crushing Throughput	tph	4 756	Average
Annual Concentrator Operating Time	hpa	8 000	91.3% availability
Concentrator Throughput	tph	3 125	~68 500 tpd
Cu Concentrate Production	tpa	230 000	~0.92% weight
Mo Concentrate Production	tpa	2 300	~0.01% weight
Magnetite Concentrate Production	tpa	200 000	~0.8% weight

17.4.2 Major Equipment Description

On the basis of the currently available metallurgical testwork results (as described in Section 12) and the preliminary process flowsheet (described in Section 17.3), some information regarding the currently selected major equipment items is presented as Table 63.

Table 63 Concentrator Major Equipment Description			
Equipment Item(s)	**No. of Trains**	**Units /Train**	**Equipment Description**
Primary Crusher	1	1	60”
SAG Mills	2	1	12.2 m diameter (40’) x ~ 9 m EGL equipped with 28 MW wrap-around VS drives.
Primary Cyclones	2	15	660 mm (design of 12 operating)
Pebble Crushers	2	-	Future installation allowance
Rougher-scavenger Flotation	2	6	~300 m3 tank cells (or similar)
Bulk Concentrate Regrind	1 or 2	1 or 2	Pending bulk conc. regrind size selection
Cu Cleaner Flotation	1	2 or 3 stages	Pending Cu cleaner testwork results
Cu/Mo Concentrate Regrind	1	1	Pending Cu/Mo conc. regrind size selection
Mo Flotation	1	4 to 8 stages	Pending Mo separation and cleaner testwork results
Rougher (Cobbing) Magnetic Separation	1	25	3 m single drum width (design of 22 operating)
Primary Magnetite Concentrate Regrind	1	1 or 2	Pending primary magnetite concentrate regrind size selection
Cleaner Magnetic Separation	1	2	3 m dual drum width (design of 1 operating)
Tailings Thickener	1	1	65 m diameter high rate
Cu Concentrate Thickener	1	1	8 m diameter high rate
Mo Concentrate Thickener	1	1	2 m diameter high rate
Magnetite Conc. Thickener	1	1	8 m diameter high rate

18. PROJECT INFRASTRUCTURE

18.1 General Infrastructure

The project facilities would be located predominantly at the Yandera Site. The location would ultimately house the open pit mine, processing plant, camp accommodation and associated facilities to support the operation. As indicated earlier, the Yandera Project has existing facilities at the mine site to support current exploration and early development activities. These would all need to be upgraded or demolished to support the new operation.

It should be noted also that additional facilities on a lesser scale would be required at the coastal cities of Madang and Lae.

The Madang city has existing infrastructure which could be upgraded and utilised for the project.

The Madang project facilities would receive, filter, store and load the magnetite and copper concentrate for export via the upgrading of an existing ship loading facility. A new power generating facility, fuel storage facility, small admin office and in-transit facility would also be located at the proposed area. It is assumed that access and usage rights could be secured from the owners/occupiers of that facility.

Lae would be the primary import port for construction and operational materials. As described previously, it has extensive wharf and ship unloading facilities, and would receive, unload, warehouse and transport materials to the Yandera site via the existing Highlands and Ramu Highway.

18.2 Road Access

Access to the project site would be from the coastal towns of Madang (95km away) and Lae (320 km away) via either the Ramu Highway (ex Madang) or Highland Highway (ex Lae). Access to the project site would be via Madang for personnel and Lae for most materials and bulk cargo.

The existing road network from which the project site would be accessed comprises the main Highland Highway connecting the coastal city of Lae with the highlands to the west, running along the mountainous spine of the country through Goroka, Mt. Hagen and terminating at Kopiago near the border with Indonesia. A spur road off this, the Ramu Highway branching at Watarais about 150km west from Lae, leads a further 165km west and north to Madang. The last 65km of this route, from Usino Junction, passes over the western end of the Finisterre Ranges out to the coast in a steep, unstable and unreliable section of road.

An existing rural road runs west from the hamlet of Usino to the Chinese Bridge crossing the Ramu River. It is of moderate quality, is founded on a raised rock base encasing the Ramu Nickel pipe line for a proportion of its length and is about 20km long.

Temporary access to the project site would be achieved by upgrade to the existing roads and tracks connecting the project site to Kundiawa on the Highlands Highway a short distance west from Goroka. The new, permanent access road to the project site would be developed from the Chinese Bridge with a route length of about 45km.

The road standard would be fit for purpose for the Marengo approved vehicles and trained drivers using the road for commercial purposes. Any bridges would be single lane, as are the bridges on the public roads leading to the Chinese Bridge. Short sections of the road itself might also be single lane. Drainage would need to be to a high standard, but it is expected that the unstable country would create slips and subsidences from time to time, as occur on all the public roads in the area. This would require ongoing light maintenance and the surface would be unsealed so as not to hinder such maintenance.

18.3 Ship Loading Facility

The existing Jant unloading berth at Madang is suitable for ships of Handymax size, being approximately 40,000 tonnes deadweight, 180m long and with a 10m draft. It might require minor dredging at the southeast end to remove silting. The shiploader boom is luffing only, and thus the ships would need to be drafted back and forth during the loading exercise. This would be slow but acceptable.

It is reported that this berth has been used in the past for unloading fuel to the adjacent and now unused fuel farm. It is intended that it would again be used for this purpose for unloading to the power generation fuel storage.

The established pilot and tug services at Madang port would be used.

The ship loader and conveyors would need extensive modification because of age deterioration, the much denser product, and hence higher tonnage loading rate, and because of the need to prevent any spillage of copper concentrate into the harbour.

18.4 Power and Communications

18.4.1 Power

The project power demand at the assumed 25 Mtpa throughput rate would be approximately 80MW. Power would have to be self generated and be independent of the national grid system which connects Madang to Lae and draws power from a hydro station on the upper reaches of the Ramu River.

It is presently assumed that there would be a single source of power reticulated between the project sites by a high voltage transmission line. Generator units are more efficient at low altitudes and would consume approximately 400 tonnes of fuel per day. These two factors point to the desirability of locating the power generation plant at the project port of Madang.

Power would be transformed down to 33kV and/or 11kV at the individual sites for distribution by overhead line to remote plant elements and by cable around the plant.

18.4.2 Communications

Site telephonic and data communication services would be via a satellite link to regional communications centres.

All radio frequencies are anticipated to be UHF band similar to Australian mining standards. All mine vehicles would have UHF radio installations as would personnel in the plant by using hand held UHF radios.

The need for repeater towers on the mine access roads is foreseen due to the mountainous terrain.

18.4.3 Fuel

The following fuel facilities would be required:

- Storage facilities of 15,000 tonnes of fuel at Madang for use in power generation (fuel would be delivered via the Madang port); and
- A diesel receiving storage facility at Yandera mine site with an available capacity of 1,700m^3. Yandera would receive diesel fuel via road tanker from Lae.

18.5 Process and Potable Water

Average annual rainfall approximates 3.5 to 5m in the Yandera area and the coast. These rates equate to up to approximately 5Mtpa of water per square km for Yandera and the coast. Actual run-offs would be somewhat less than this due to ground water recharge, evapotranspiration and evaporation but, depending on circumstance and area, would approach those figures.

Additional water input to the project would arise from ground water entry into the open cut of the mine. Standing water is also subject to evaporation, which is understood to be about 1.8m per year.

It is apparent that high volumes of surplus contact water would be generated at the project site.

This contact water run-off would need capture and priority direction to satisfy the process plant demand, followed by quality assessment, treatment by settling and, possibly, pH adjustment and, finally, discharge to the environment of the balance.

Only notional supplementary arrangements would need to be made for the supply of process water. It would be delivered by the contact water collection systems which would incorporate dams and surge capacity. At all sites, however, relatively small amounts of clean raw water would be required for such matters as personnel use, fire fighting reserves and reagent preparation. These would readily be satisfied by provision of small weirs on minor streams.

At Madang, contact water on the industrial site would be handled as at present. At this site there would be production of approximately 300,000tpa of filtrate which would need treatment before discharge.

18.5.1 Potable Water

The mine and accommodation sites would be supplied with raw water from either of two rivers bordering the project area. Water would be piped via electric pumps supported by diesel generators to the mine accommodation village (to be established approximately 10-12 km north of the mine site) and the mine site.

Raw water would be treated at both the camp and mine sites via a packaged sea contained transportable type water treatment plant for use throughout both sites.

Raw water would be delivered to a raw water tank located at the camp and to a HDPE lined raw water dam at the plant site and be reticulated throughout the plant site via installed piping.

18.5.2 Process Water

The plant site process water would be supplied predominantly by return water for the tailings management facility (TMF) which would pump decant water to the HDPE lined process water pump. Make-up water would be sourced from the contact water diversion systems as required.

18.6 Buildings

Most proposed buildings would be flat pack standard prefabricated transportable units constructed from sandwich panel, external aluminium door and window frames, internal timber door frames, a pitched profile metal sheet roof with linoleum floor coverings. This standard configuration applies to all buildings unless described otherwise.

18.6.1 Administration Buildings

In general, the administration buildings would include a reception area, offices, open plan space, meeting rooms, training area, kitchen, staff meals area and staff ablutions.

At the project site, the office would accommodate general administration, environmental staff, safety staff, training staff, community relations, contractor management, mine planning and administration and plant planning and administration.

At Madang the administration building would include similar functions for a smaller staff size without mine planning and administration. The Madang facility would also incorporate additional minor facilities such as medical treatment/first aid area, crib, ablutions, lab, and transient staff movement facilities.

18.6.2 Mine/Plant Workshop and Warehouse Facility

At the plant site, the plant workshop and warehouse would be combined in a single structure which would house:

- the plant workshop;
- the light vehicle workshop;
- a warehouse;
- a tyre change area;
- a lube bay & lube store;
- the mining heavy vehicle workshop; and
- offices and ablution facilities.

The building would have a full length roof ridge vent and would be fitted with both high bay and natural lighting. Both 40 tonne and 10 tonne overhead travelling cranes would be provided. A fenced 40m x 40m lay down would be included with a partitioned hardstand, complete with double gates.

Two transportable buildings for offices, meals and stores would be provided for warehouse and maintenance staff.

Air and potable water services would be provided to the building.

At Madang, a small workshop, warehouse would be provided to service the filtrate, storage and unloading facility, as well as support the power station requirements. The warehouse would provide for general warehousing of mine support materials which might be shipped through Madang.

18.6.3 Crib Room

Crib rooms would be provided for employees to store meals and take breaks during shifts.

18.6.4 Ablutions

Two ablution blocks areas would be provided for the plant area.

The ablution block located at the plant workshop would contain toilet, shower and change facilities. Each block would have two separate areas for ablutions and change room with lockers.

The administration area ablution block would contain toilets and washing basins only.

18.6.5 First Aid Facility

The first aid facility would include separate rooms suitable for a site medical officer, examination room, treatment room and resting room.

The sites would have an emergency response vehicle, and trained medical staff to deal with minor accidents. The building would have an adjacent carport structure for an ambulance.

The site medical team would consist of a dayshift crew comprising of a trained doctor and nurse.

The nearest hospital facility for all sites is at Madang. The hospital would be approximately a 3 hour drive from Yandera.

In emergency situations a helicopter could be mobilised from Madang or Lae.

18.6.6 Laboratory & Sample Preparation

A single laboratory and sample preparation facility would be provided for both plant and mine requirements. A smaller facility would be provided at Madang to support concentrate sampling at dispatch.

18.6.7 Control Room

The plant control room would be located above the MCC room and an operational control room in the Process administration block.

The control room would be constructed from local concrete blockwork with external aluminium door and window frames, and internal timber door frames, with a metal sheet roof.

18.7 Accommodation Camp and Sewage

There would be a mine accommodation camp some 10 to 12 km from the mine site.

The building layout would range from small dormitory to individual villa layout depending on seniority, linked by enclosed corridors. The camp would include a kitchen and dining/meals area, administration office, toilets, recreation rooms, first aid room, laundry, community hall, training area and various stores.

18.8 Tailings Facility and Waste Dump

The Tailings Management Facility (TMF) is expected to be a land based, valley type tailings storage facility. The preferred location is in the Tai-yor River valley, which is immediately adjacent to the mine site. Optimisation studies are further defining this facility.

Concentrator tailings would be thickened and then pumped to the nearby TMF located over the confluence of the Tai-yor and Yamagu Rivers. The TMF would be designed to be integral with the mine waste dump.

Tailings deposition yield water and incident rainwater would be preferentially utilised as process water and the surplus treated if necessary and discharged to the local environment.

18.9 Explosives

Ammonium nitrate receipts at Lae would be road transported to the mine site from the supplier's facilities in Lae at a rate to meet the demand of about 40 tonnes per day. To allow for the unreliability of this method, on-site storage for 10 days, or 400 tonnes, would be provided at Yandera. The Contractor's on site facility would mix, transport and place the charges.

19. MARKET STUDIES AND CONTRACTS

19.1 Introduction

An initial market review has been conducted for the intended products and to investigate the terms under which the products may be sold.

The initial market review is based on a hypothetical feed rate of 25 million tonnes per annum to produce copper and molybdenum concentrates, and a magnetite concentrate, all of which are anticipated to be exported.

The product markets have been reviewed expecting the mine life to be some 20 years.

19.2 Products from the Project

19.2.1 Testwork

Testwork to optimise production parameters is approaching finalisation. Once this testwork is assessed, the products that would be produced from the project would be finalised.

The initial market review was conducted based upon the following products, using indicative information on feed grades, concentrate grades and recoveries of valuable elements into concentrates.

19.2.2 Copper Concentrate

- concentrate production: 230,000 t/a;
- concentrate grade: 30% - 35% Cu, plus gold and silver.

Testwork to date has shown levels of any penalty elements to be such that they would not attract smelter penalties.

19.2.3 Molybdenum Sulphide Concentrate

- concentrate production: 4,000 t/a;
- concentrate grades: 50% Mo, plus rhenium.

Testwork to date has shown levels of any penalty elements to be such that they would not attract smelter penalties.

19.2.4 Magnetite Concentrate

- concentrate production: 200,000 t/a;
- concentrate grade: 67% Fe.

19.3 Product Markets

19.3.1 Copper Concentrate Markets

Normally the smelter pays the producer about 96 % of the copper metal value based on metal content contained in the concentrate less treatment and refining charges and any applicable penalties or credits.

Preliminary indications are that the Yandera copper concentrate would have a 30% to 35% copper content and should contain levels of gold and silver that would result in credits for them. Such a concentrate is likely to be readily marketable internationally on typical smelter terms.

19.3.2 Molybdenum Concentrate Markets

Molybdenum is a metal that has the ability to withstand extreme temperatures and has a high resistance to corrosion. Stainless and construction steels form the largest market for molybdenum, accounting for some 60% of consumption.

Mined molybdenum comes from two main sources; as a by-product of copper mining and from primary molybdenum mines. By-product output from copper mines can account for a large portion of mine supply and, as a result, production of molybdenum tends to be related to copper demand rather than molybdenum demand. Many primary producers are “swing” producers that adjust production to the level of demand (and price). The Yandera project would produce molybdenum as a by-product to copper mining.

Molybdenum disulphide concentrates typically contain greater than 50% Mo and are largely then roasted to produce roasted concentrates, which is the raw material for the preparation of most other molybdenum products, and is the principal product for adding molybdenum to alloys and stainless steels.

Given that at the hypothesised plant throughput of 25Mtpa the amount of molybdenum concentrate produced is likely to be some 4,000 t/a, it is anticipated that it would be sold to a roaster, rather than toll treated.

A related issue for molybdenum concentrates is rhenium content. A rapid increase in the price of rhenium between 2003 and 2008 increased interest in the rhenium content of molybdenum concentrates. Now that the price has fallen this interest appears to have abated.

Preliminary indications are that a 50% Mo and above molybdenum sulphide concentrate would be marketable. Payment would be received for a large portion of the contained molybdenum. The level of payment for rhenium content in the concentrate is unknown at this time.

19.3.3 Magnetite Concentrate Markets

Globally, magnetite concentrates comprise almost half of iron ore production, a little less than hematite. Magnetite material must be upgraded to make it suitable for steelmaking; at which point it is globally accepted as a viable and high quality feedstock for the production of premium quality, low impurity steel.

While magnetite concentrates worldwide are produced largely from massive iron deposits, they are also produced as by-products from copper mines. For the Yandera Project, production of magnetite would be from the concentrator tailings stream, by regrinding and magnetic separation and, possibly, reverse flotation.

Initial indications are that the 67% Fe concentrate anticipated to be produced from the Yandera Project would be marketable. Although the 200,000 tonnes per annum is low by iron ore industry standards, levels of some desirable elements may make the product attractive for use in the steel industry.

20. ENVIRONMENTAL STUDIES

20.1 Environmental Investigations

The relevant investigations being done under the guidance of Coffey Environments and their status are as follows (Table 64):

Table 64 Status of Investigations undertaken by Coffey Environments

No.	Study	Specialist Consultant	% Complete
1	Archaeology and Material Culture.	Arafura Consulting.	75%
2	Aquatic Biodiversity.	ALS.	50%
3	Terrestrial Vegetation and Fauna.	3D Environmental.	75%
4	Land use/land resources use.	Coffey Environments	75%
5	Water use/water resources use.	Coffey Environments	75%
6	Noise, Vibration and Blast Overpressure.	SLR Consulting.	30%
7	Air Quality, Greenhouse Gas and Energy Consumption.	SLR Consulting.	30%
8	Social Impact Assessment (SIA).	Coffey Environments	20%
9	Sediment Characterisation and Transport.	Alluvium.	50%
10	Streambed sediment quality.	Coffey Environments	10%
11	Landscape and Visual Amenity.	Urbis.	0%
12	Soil Characterisation and Rehabilitation.	Revegetation Contractors notified to prepare for fieldwork.	10%
13	Health and Nutrition.	Coffey Environments, DMC and Centre for Environmental Health	70%
14	Macroeconomic Impact Study.	TBA	0%
15	Conceptual closure plan.	Coffey Environments	0%
17	Nearshore marine characterisation survey/Madang Harbour studies	Coffey Environments	10%
18	Geochemical characterisation of waste rock.	EGi	100%
19	Downstream impact assessment.	Coffey Environments	0%
20	Assessment of land-based tailing management.	Coffey Environments	0%
21	Geochemical characterisation of tailing.	EGi	50%

Baseline studies have been carried out over an extended period. Fixed facilities installed and monitored include three stream gauging stations, two weather stations and extended weathering test pads for waste materials.

20.2 Pollution Sources and Mitigation Measures

20.2.1 Air Quality

Emissions at the mine site would be exhaust gases from the mining equipment, and dust from the open pit and haul roads, the waste dump/tailings impoundment structure and the exposed surface of the deposited tailings.

Natural mitigation would occur from the high rainfall level and would be supplemented by use of water trucks on haul roads and waste dump in dry periods, progressive revegetation of the flanks of the waste dump/tailings impoundment structure and operation of the tailings dam with restricted beach areas.

Emissions at the port site would be exhaust gases from the power generation plant and the potential of dust from the filtered products during storage and shiploading.

Port dust emissions would be controlled by storage of filtered products in enclosed buildings, subsequent transport in closed gallery or pipe style conveyors and a specialised shiploading boom with anti-spill provisions and telescopic loading chute into the ship's hold.

Port exhaust emissions would be managed by appropriate sizing of exhaust stacks to control the exhaust plumes.

20.2.2 Surface Waters

Chemical contamination of surface waters at the mine site would arise from plant tailings liquors and oxidation of exposed sulphide minerals in the open cut pit walls and in the waste dump/tailings impoundment structure.

Plant spillages would be totally contained within bunded areas and cannot escape to the environment except by way of the tailings liquors.

Testwork has indicated that, under normal weather patterns, sufficient dilution by natural waters would occur to bring the discharge streams into compliance with national standards. It is possible that supplementary water treatment by pH adjustment might be required in prolonged dry periods. Acid discharge generated by oxidation of the sulphide mineralised portion of the mine waste, being about 20% of the total waste, would be avoided by placement of this material below water level within the tailings impoundment rather than placing it in the waste dump/tailings impoundment structure.

Turbidity of surface waters at the mine site would arise from run-off from the disturbed areas created by the presence of the plant, the associated facilities, the connecting roads and tracks, the exposed flanks of the waste dump/tailings impoundment and the discharges from the tails decant pond.

Local settling basins would be provided to bring local stream quality into compliance with national standards.

Chemical contamination of discharge waters at the port site would occur from extraction of filtrate from the transported product slurries during production of the product filter cakes. Testwork has indicated that this water quality meets the appropriate national standards and can be directly discharged to the harbour.

Turbidity of discharge waters at the port site would arise from run-off from the disturbed areas created by the presence of the plant and suspended solids in the product production filtrate. Other causes are plant spillages.

A surge pond and clarifier would be provided to bring turbidity of discharge streams into compliance with national standards before discharge to the harbour waters.

20.2.3 *Ground Waters*

Chemical contamination of ground water at the mine site would arise from seepage from the tailings impoundment. Turbidity of ground water would not be affected.

Seepage would be minimised by provision of a cut off wall below the containment structure. Water seeping from the tailings and the containment structure itself would be captured in a seepage dam downstream. Testwork indicates that this water would be suitable for direct discharge in any event, being compliant with national standards. However, provision is included for dilution of or treatment of this water by pH adjustment prior to discharge.

Local direct use of ground water is minimal. Domestic water sources would be from streams and springs located at much higher elevations than the potential seepage discharge points from the project.

Chemical contamination of ground water at the port site could only arise from plant spillage. Turbidity of ground water would not be affected.

Plant spillages would be totally contained within bunded areas and cannot escape to the environment except by way of the filtrate stream.

20.3 Other Environmental Factors

20.3.1 *Topsoil Management*

The footprints of the plant, accommodation camp, miscellaneous facilities and the initial tailings impoundment structure and open cut pit would be stripped of top soil and the removed material stored, where practicable, in deep stockpiles for later rehabilitation use. Top soil would be progressively removed and stored, again where practicable, from the open pit and tailings impoundment areas as their footprints expand.

The most immediate re-use of the stored material would be for the downstream flanks of the tailings impoundment to promote revegetation and stabilisation against erosion. The balance would be retained for rehabilitation of the plant and similar disturbed areas, as well as the re-contoured surface of the tailings, on closure.

20.3.2 *Terrestrial Plant and Animal Life*

Investigations to date have not identified unique species in the project area. The locality is heavily wooded, plant regrowth in disturbed areas is rapid and the impact of the project development is anticipated to be entirely local.

20.3.3 *Aquatic Plant and Animal Life*

Impact assessment is not complete. However, it is anticipated that achievement of compliance with national discharge standards would minimise the impact to acceptable levels.

20.3.4 *Noise, Light and General Amenity*

Construction Phase

a) Yandera Village and other locals

Discussions regarding the need to relocate this village are underway. Impacts on this village would be appreciable and protracted due to its location within 1.5km of the tailings containment structure. Noise and light nuisance would be appreciable, river turbidity would be increased, fauna would be disturbed and contact with a large workforce of PNG nationals and some aliens would occur. Offsetting this would be greatly increased employment opportunities and the associated diet improvements, skills training, medical services enhanced beyond the level currently provided by the Company, availability of electric power and greatly improved access and communications.

b) Villages on the new road route to the Ramu River crossing

Some degree of relocation may be required. Impacts would be short term noise nuisance, intense ground and vegetation disturbance on the road alignment, stream turbidity and short term contact with the construction crew of PNG nationals and some aliens. Longer term impacts would be construction traffic on the new road, mostly during daylight hours. Offsetting factors would be those applicable to the Yandera Village with the exception of electric power.

c) Landholders along the public road route from the Ramu River Crossing to the outskirts of Madang.

Impacts would be minor as the construction activity would be short lived and confined to the public road reserve. Short term noise nuisance and an increase in stream turbidity would be the major impacts. Offsetting benefits would be improved training and employment opportunities.

d) Madang Environs and Industrial Area

Amenity impacts would be minor as the construction activity would be relatively short lived and confined to the public road reserves and the Madang industrial area. Short term noise nuisance (longer term for those immediately adjacent to the industrial area) and the presence of a construction crew of PNG nationals and some aliens would be the major impacts. Offsetting benefits would be improved training and employment opportunities and a greatly increased level of commercial activity in support of project construction needs and the large transient workforce passing through the city.

e) Lae and Lae/Usino Road

Amenity impacts would be confined to increased traffic levels from construction materials passing through Lae port en route to the Yandera and Madang sites. An offset would be an increase in commercial activity due to the passage of goods and materials through the port.

Operations Phase

a) Yandera Village and other locals

Discussions regarding the need to relocate this village are underway. Impacts on this village would be appreciable and protracted due to its location within 1.5km of the tailings containment structure. Noise and light nuisance would be appreciable, fauna would be disturbed and contact with a large workforce of PNG nationals and some aliens would occur. Offsetting this would be greatly increased employment opportunities and the associated diet improvements, skills training, medical services enhanced beyond the level currently provided by the Company, availability of electric power and greatly improved access and communications.

b) Villages on the new road route to the Ramu River crossing

Impacts would be operations traffic on the new road, some during the night. Offsetting factors would be those applicable to the Yandera Village with the exception of electric power.

c) Landholders along the public road route from the Ramu River Crossing to the outskirts of Madang.

There would be no discernible impact other than an increase in traffic due mostly to personnel movements between Yandera and Madang. Offsetting benefits would be improved training and employment opportunities.

d) Madang Environs and Industrial Area

Amenity impacts would be minor, confined mostly to an increase in traffic. Offsetting benefits would be improved training and employment opportunities and a greatly increased level of commercial activity in support of project operations needs and the substantial workforce passing through the city.

f) Lae and Lae/Usino Road

Amenity impacts would be confined to increased traffic levels from operations materials passing through Lae port en route to the Yandera and Madang sites. An offset would be an increase in commercial activity due to the passage of goods and materials through the port.

20.4 Permitting

An Environmental Inception Report (EIR) has been submitted, preparation of an Environmental Impact Statement (EIS) is underway and a permitting schedule has been developed. The first milestones for permitting are submission of the EIS and a matching Feasibility Study for issue of a Mining Lease along with written commitments for training, employment of locals, engagement of local contractors and landholder compensation arrangements.

A permitting schedule has been prepared which shows the need for a further 5 permits under the Mining Act, 5 permits under the Mine Safety Act, 5 permits under the Environment Act, 5 permits under the Explosives Act / Inflammable Liquids Act / Industrial Safety, Health and Welfare Act, 3 permits under the Employment of Non-Citizens Act, 3 permits under the Foreign Exchange and Gold Regulations, 2 licenses under the Income Tax Act and Customs Act and about 12 further licenses and permits for miscellaneous purposes. As is evident from the titles, most of these are not required for some time.

20.5 Communications with Local Communities and Landholders

The Company has employed a team of local experts in community relations and land ownership matters for a number of years which has been in constant communication with potentially affected parties. Appropriate landholder associations have been formed to enable meaningful negotiations and a comprehensive presentation has been made formally to all groups likely to be influenced by the development of the project. The feedback has been noted and accommodated where possible in the provisions being included in the EIS.

21. CAPITAL AND OPERATING COSTS

Nothing to report because no relevant data is available at this time.

22. ECONOMIC ANALYSIS

Nothing to report because no relevant data is available at this time.

23. ADJACENT PROPERTIES

With respect to Marengo's Yandera project the closest granted licenses held by other companies are listed below:

- EL193 held by Ramu Nickel has an area of 248.93 km^2. It is located 20km north northeast of Yandera and is the site of the Ramu Nickel Mine which is based on a nickel cobalt laterite resource. The Ramu mine is majority owned by China's Ramu Nico Management (MCC) Limited. Commissioning commenced at the mine in 2011 (Ramu, 2012).
- EL1304 held by Daehan Resources Development Ltd has an area of 287.2km^2. It is located approximately 50 km northwest of Yandera (MRA, 2012).

- EL1596 held by Frontier Gold (PNG) Ltd has an area of 335.1km^2. It is located approximately 70km west of Yandera (MRA, 2012).
- El 1755 held by Australian PNG Minerals (APM) has an area of 2,422km^2. It is located approximately 75km northwest of Yandera. APM is targeting in order of priority gold followed by copper, nickel and platinum (APM, 2012).

24. OTHER RELEVANT DATA AND INFORMATION

Nothing to report because no further relevant data is available at this time.

25. INTERPRETATION AND CONCLUSIONS

The Yandera Copper-Molybdenum-Gold Project reviewed as a part of this 2012 updated resource modelling study has so far demonstrated and confirmed that this area contains significant amounts of copper mineralisation. The tonnages reported, for example above a nominal 0.50% Cu lower cut-off, and the coincident contained metal tonnages are significant.

The locally high grade characteristics, along with the relatively well understood geometry of many of the deposit areas probably does not currently warrant the consideration of substantial amounts of additional deep drilling for the purposes of defining additional resources within the main deposit areas.

It is recommended that further programs of resource drilling be carried out, directed towards preliminary grade control planning for initial extraction of some of the higher grade copper resources particularly near surface. Additional resource definition is required to assist decisions related to determining more accurately the defining mineralisation and/or future mining boundaries and the respective changes or interfaces as they may be affected by material type and weathering characteristics. It is Ravensgate's opinion that the localised copper distribution variances tend to be fairly high and this may not be immediately evident in sparsely drilled areas. A close spaced grade control drilling pattern across selected areas of the Yandera deposit area will be most beneficial in confirming the localised copper variance characteristics of the deposit. Some of this type of close spaced drilling has already been carried out at selected locations at Yandera and the results of this have been most beneficial in both confirming and calibrating specific parts of the Yandera Resource Block Model to date.

Whilst there has been ongoing focus on the overall observed copper mineralisation, it has also become clear that the proper definition of the extent of the lithologically controlled ancillary elements molybdenum and gold still requires additional study and should remain a priority. To this end it is also recommended that further attention be given to re-defining the lithology transition interfaces both within and on the peripheries of the main deposit area using refined geochemical methods. As part of this refinement exercise it is recommended that the modelling of the 3-D surfaces describing rock mass and structural controls are reviewed carefully in conjunction with copper mineralisation and any updated structural mapping as it becomes available. Some revision of associated alteration geochemistry already available as in some of the ancillary assayed elements database may well be useful.

Comparison with similar deposits indicates that the Yandera Project has the characteristics to enable it to become a viable large scale mining operation delivering marketable quality copper and molybdenum concentrates and magnetite. The very recent completion of the resource model has not provided the opportunity for a detailed examination of the economics which, consequently, are not further discussed herein.

The deposit has attracted the attention of a large Chinese construction group which is interested in promoting the project in the Chinese banking community and, after appropriate further study, providing an offer for development which contains a large fixed price element of costs. An MOU with the referenced group, China Non-ferrous Metal Industry's Foreign Engineering Construction Co. Ltd. (NFC), was entered into in October 2010. NFC has participated in a parallel testwork programme to that being carried out in Perth, Western Australia and are currently preparing a process plant design.

The PNG community, from national to local level, has expressed positive views about the desirability of development.

26. RECOMMENDATIONS

It is Ravensgate's opinion that the localised copper distribution variances have been observed to be fairly high locally and this observation tends to be less obvious in sparsely drilled areas. A close spaced grade control drilling pattern across selected areas of the Yandera deposit area will be most beneficial in confirming the localised copper variance characteristics of the deposit and will also serve to help calibrate the existing and future block models to help ensure better results for future pit optimisation and preliminary mine production scheduling studies. Future modelling studies, as part of best industry practice relating to continuous improvement, would be enhanced by refined rock mass and structural modelling as updated structural mapping becomes available in conjunction with a copper mineralisation distribution review that will follow additional drilling. Some revision of associated alteration geochemistry, which is already available as in some of the ancillary assayed elements database, may well be useful to review also. These up-dates should ideally be incorporated before commencement of detailed mine planning prior to project construction.

It is recommended that the studies on the project be carried forward to Feasibility Study level and that the documents and supporting activities, such as the Environmental Impact Statement and others required to initiate the full project permitting process, also be progressed to completion. Advancing the study to that point would require the expenditure of approximately US$5M. Should that show that application for permits is the logical next step then that should be done and the supplementary work required to obtain a proposal for a Development Contract, with the majority of the construction activities undertaken for a fixed price, should also be undertaken. It is estimated that a further US$5M would be required to advance the technical and commercial aspects of the project to that stage.

27. REFERENCES

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Flotation Testwork Yandera Cu-Mo Samples	ALS Ammtec	October 2011
Yandera Copper-Molybdenum Project Phase 2 Interim Report Comminution and Pulp thickening Circuit	Amec Minproc	July 2011
Metallurgical Testwork conducted upon Samples of Ore from the Yandera Copper/Molybdenum Project	Ammtec	Jan 2011
Metallurgical Testwork conducted upon Samples of Copper Drill Core from the Yandera Copper Project for Marengo Mining (PNG)	Ammtec Limited	June 2008
Metallurgical Testwork conducted on Yandera Cu/Mo Ore	Ammtec Limited	October 2010
Environmental Inception Report Yandera Copper-Molybdenum-Gold Project	Coffey Environments	March 2012
Environmental Inception Report Yandera Copper-Molybdenum-Gold Project	Coffey Environments	February 2011
Single Beam Bathymetric Survey Report	Coffey Environments	July 2010

Soil Characterisation and Rehabilitation Study Brief	Coffey Environments Australia Pty Ltd	February 2011
Health and Nutrition Assessment Brief	Coffey Environments Australia Pty Ltd	March 2011
Phase 1 Report - Yandera Project	Coffey Natural Systems	September 2007
Geochemical Characterisation and ARD Assessment of Drill Core Samples (Prepared for Coffey Natural Systems Pty Ltd)	Environmental Geochemistry International Pty Ltd	January 2009
Column leach testing of composite Waste Rock Samples - (18 Month Progress Report) - Draft	Environmental Geochemistry International Pty Ltd	May 2011
Revised Technical Report (Effective November 2007)	Golder Associates	March 2008
DFS - Phase 1 Options Report	GRD Minproc	May 2008
Yandera Copper-Molybdenum Project DFS - Phase 1 Options Report	GRD Minproc	April 2008
Report - Downstream Processing Options	GRD Minproc	April 2008
Metallurgical Testwork Report	GRD Minproc	June 2009
Magnetite Scoping Study Report	GRD Minproc	June 2009
Process Plant Layout Options Study	GRD Minproc	June 2009
Comminution Circuit Desktop Study, Yandera Cu-Mo Project	GRD Minproc	September 2009
Yandera Ore Characterisation and Flotation Testwork for Marengo Mining (Rev 0)	IML Pty Ltd (now trading as AMDEL Ltd)	July 2007

28. GLOSSARY

Alluvium	Clay silt, sand, gravel, or other rock materials transported by flowing water and deposited in comparatively recent geologic time as sorted or semi-sorted sediments in riverbeds, estuaries, and flood plains, on lakes, shores and in fans at the base of mountain slopes and estuaries.
Alteration	The change in the mineral composition of a rock, commonly due to hydrothermal activity.
Argillic	Of or pertaining to clay or clay minerals.
Assayed	The testing and quantification metals of interest within a sample.
batholith	A massive igneous intrusion extending into the earth's crust.
Bornite	A copper ore mineral, Cu_5FeS_4.
Breccia	Rock consisting of angular fragments enclosed in a matrix, usually the result of persistent fracturing by tectonic or hydraulic means.
chalcocite	A copper sulfide (Cu2S) which is an important copper ore mineral.
Chlorite	A green coloured hydrated aluminium-iron-magnesium silicate mineral (mica) common in metamorphic rocks.
Clastic	Pertaining to a rock made up of fragments or pebbles (clasts).
covellite	A copper sulfide mineral (CuS).
cuprite	Is a copper oxide mineral (Cu_2O), a minor copper ore mineral.
decluster	A mathematical technique for spatially reducing bias in drillhole data.
discretisation	A means of adjusting for volume variance effects for block estimates in cases of variable sample spatial distribution.
Dykes	A tabular body of intrusive igneous rock, crosscutting the host strata at a high angle.
epidote	A lustrous yellow, green, or black mineral commonly found in metamorphic rocks.
fault zone	A wide zone of structural dislocation and faulting.
Felsic	An adjective indicating that a rock contains abundant feldspar and silica.
g/t	Grams per tonne, a standard volumetric unit for demonstrating the concentration of precious metals in a rock.
Gabbro	A fine to coarse grained, dark coloured, igneous rock composed mainly of calcic plagioclase, clinopyroxene and sometimes olivine.
Geochemical	Pertains to the concentration of an element.
Geophysical	Pertains to the physical properties of a rock mass.
Granite	A coarse-grained igneous rock containing mainly quartz and feldspar minerals and subordinate micas.
Granodiorite	A coarse grained igneous rock composed of quartz, feldspar and hornblende and/or biotite.
intermediate	A rock unit which contains a mix of felsic and mafic minerals.
intrusions	A body of igneous rock which has forced itself into pre-existing rocks.
joint venture	A business agreement between two or more commercial entities.
laterite	A cemented residuum of weathering, generally leached in silica with a high alumina and/or iron content.
lead	A metallic element, the heaviest and softest of the common metals.
libethenite	Libethenite is a secondary copper phosphate mineral found in the oxidized zone of copper ore deposits, ($Cu_2(PO_4)(OH)$).

lithology	A term pertaining to the general characteristics of rocks.
mafic	A dark igneous rock composed dominantly of iron and magnesium minerals (such as basalt).
Magmatism	The motion or activity of magma.
magnetite	A mineral comprising iron and oxygen which commonly exhibits magnetic properties.
molybdenite	A molybdenum ore mineral (MoS_2).
monzogranite	A granular plutonic rock containing approximately equal amounts of orthoclase and plagioclase feldspar, but usually with low quartz content.
Monzonite	Coarse grained igneous rocks with equal amounts of alkali and calc- alkali feldspars.
Mt	Million Tonnes.
Ophiolites	Are sections of oceanic plate that have been thrusted (obducted) onto continental plates.
Potassic	Of, relating to, or containing potassium.
residual	Soil and regolith which has not been transported from its point or origin.
resources	In situ mineral occurrence from which valuable or useful minerals may be recovered.
silica	Dioxide of silicon, SiO_2, usually found as the various forms of quartz.
soil sampling	The collection of soil specimens for mineral analysis.
stratigraphic	Composition, sequence and correlation of stratified rocks.
stream sediment sampling	The collection of samples of stream sediment with the intention of analysing them for trace elements.
strike	Horizontal direction or trend of a geological structure.
sulphide	A general term to cover minerals containing sulphur and commonly associated with mineralisation.
supergene	Process of mineral enrichment produced by the chemical remobilisation of metals in an oxidised or transitional environment.
tectonic	Pertaining to the forces involved in or the resulting structures of movement in the Earth's crust.
univariate	A function for a single variable that gives the probabilities that the variable will take typically above a given value.
variogram	Is a semi-variogram which is a mathematical and graphical representation of how the grade varies over increasing distances in different directions within a given domain.
veins	A thin infill of a fissure or crack, commonly bearing quartz.
zinc	A lustrous, blueish-white metallic element used in many alloys including brass and bronze.

29. CERTIFICATES OF QUALIFIED PERSONS

Stephen James Hyland, Qualified Person for Sections 1, 6-12, 14, 23, 25-29

1. I, Stephen James Hyland hereby certify that I am a consultant geologist, Principal of Ravensgate with offices at Level3, 44 Parliament Place, West Perth 6005, Australia.
2. I am a graduate of James Cook University, Townsville, Queensland Australia (B.Sc.) in Geology, 1984.
3. I am a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM – member number 108070) and a Member of the Canadian Institute of Mining and Metallurgy (CIM - member number 140313).
4. I have practiced the profession of geologist continuously since graduation; experience relevant to this report includes 20 years industry experience in the field of company and mineral asset appraisal and exploration and mining geology. I have worked for major exploration companies and formed a consulting practice 7 years ago. I have wide experience in a number of commodities including gold, base metals, coal and mineral sands. I have been responsible for project discovery through to feasibility study in Australia and technical audits in many countries. I have worked in the area of resource/reserve audit for project finance purposes.
5. For the purposes of this technical report I am a "Qualified Person" as defined by the National Instrument 43-101, Part 1.2. I have read this instrument and Form 43-101F1 and the parts of the Technical Report for which I am responsible have been prepared in compliance with that instrument and Form 43-101F and Australasian JORC code. By applying the tests set out in Part 1.5 of National Instrument 43-101 I am independent of the issuer
6. This Technical Report is based on my personal review of the information available on the properties; from discussions with geological personnel of Ravensgate and Marengo Mining limited.
7. I have not visited the Marengo Mining Limited project area.
8. I am responsible for sections 1, 6-12, 14, 23, 25-29 of the technical report;
9. I am not, nor intend to be, a director, officer or other direct employee of Marengo Mining limited or any of its subsidiaries and have no material interest in the Projects or Marengo Mining limited. My relationship with Marengo Mining limited is solely one of professional association between client and independent consultant. The review work and this Report are prepared in return for professional fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this Report.
10. I have undertaken previous unrelated work for Marengo Mining limited and I may undertake to conduct further work if requested to do so as an independent geological consultant for this report and any possible further work. I expect to receive no remuneration other than normal professional fees and reimbursement of expenses incurred.

11. The Technical Report has been compiled based on information available up to and including the date of this Report. I have given my consent for the distribution of this report in the form and context in which it appears.
12. I do not own or expect to receive an interest (direct, indirect or contingent) in the property described herein, nor in the securities of Marengo Mining limited.

Stephen James Hyland BSc Geology, FAusIMM, CIMM, GAA, MAICD.

Original signed at Perth, Western Australia this 16 May 2012

Karl Smith, Certificate of Qualified Person for Sections 1-4, 6-12, 14, 23, 25-29

1. I, Karl Smith hereby certify that I am Principal Consultant of Karl Smith Mine and Geology Consulting of 83 Bathurst Road, Orange, NSW 2800, Australia.
2. This certificate applies to the 14 May 2012 technical report titled "Technical Report on the Yandera Copper-Molybdenum-Gold Project, Madang Province, Papua New Guinea for Marengo Mining Limited".
3. I am a graduate of The University of Texas at El Paso with a Master of Science degree in Geology, 1986 and a graduate of Indiana University with a Bachelor of Science in Geology, 1983.
4. I have extensive experience of 24 years in geology and mine planning. I began working as a Computer specialist/Geophysicist in 1987 working in mineral resource and ore reserve modelling and developed a custom grade control system. From 1990 to 1998 I was employed in a number of roles including geological systems analyst and senior mine engineer. At the end of 1998 I began work as Principal Engineer – Open Cut Planning for a large copper/gold mine. In 2005 I joined Ok Tedi Mining where for nearly four years I managed the geology and mine planning functions. At Ok Tedi I personally built the mineral resource model from geologic interpretations that I reviewed and approved. The copper and gold grade estimates were the result of geostatistical techniques. In 2009 I joined Golden Star Resources as Vice President Technical Services where I was responsible for the public reporting on Mineral Reserves under Canada's NI 43-101. In December of 2011 I founded Karl Smith Mine and Geology Consulting. I am a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM – member number 209397). By reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I am a Qualified Person for the purposes of NI 43-101;
5. I visited the site relevant to this technical report from the 14th through 16th April 2012;
6. I am responsible for sections 1-4, 6-12, 14, 23, 25-29 of the technical report;
7. By applying the tests set out in Part 1.5 of NI 43-101 I am independent of the issuer;
8. My involvement with the property that is the subject of this technical report began in January of 2012 when I reviewed a previous technical report on a mineral resource for the Yandera project;
9. I have not undertaken previous unrelated work for Marengo Mining Limited. I may undertake to conduct further work if requested to do so as an independent geological consultant for this report and any possible further work. I expect to receive no remuneration other than normal professional fees and reimbursement of expenses incurred;
10. The Technical Report has been compiled based on information available up to and including the date of this Report. I have given my consent for the distribution of this report in the form and context in which it appears;

11. I do not own or expect to receive an interest (direct, indirect or contingent) in the property described herein, nor in the securities of Marengo Mining limited.

12. I have read this 43-101 Instrument and this technical report. The sections of the report I am responsible for were prepared in compliance with this instrument and Form 43-101F and the Australasian JORC code. To the best of my knowledge, information and belief the portions of this technical report that I am responsible for contain all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Karl Smith, BSc Geology, MSc Geology, FAusIMM.

Original signed at Orange, New South Wales, Australia this 16 May 2012

Paul Kreppold, Qualified Person for Sections 1-5, 13 and 15-29

1. I, Paul Kreppold hereby certify that I am the General Manager, of Arccon Mining Services with offices at Level 1, 256 Stirling Highway, Claremont, WA 6010, Australia.
2. I am a graduate of Curtin University of Technology, Perth, Western Australia (BEng(Hons)) in Civil Engineering, 1986. I have a Masters degree (MEngSt) in Engineering from the University of Western Australia, 1996. I am also a graduate of Murdoch University, Perth, Western Australia (LLB) in Law, 2000.
3. I am a Fellow of the Institution of Engineers Australia (FIEAust – member number 232426), a Chartered Professional Engineer (CPEng) and am registered on the National Professional Engineers Register (NPER). As a Charted Professional Engineer and a Fellow of the Institution of Engineers Australia I have equivalent professional standing to a Canadian Engineer as agreed between the professional bodies of the two countries (the "Washington Accord", signed in 1989 and updated in 2007).
4. I have practiced the profession of engineering continuously since graduation. Experience relevant to this report includes 26 years industry experience in the field of mining projects and process plant design. I have worked for major engineering companies and occupied the position of principal engineer, chief engineer, engineering manager and general manager. I have read the definition of "Qualified Person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience I fulfil the requirements to be a Qualified Person for the purposes of NI 43-101.
5. This Technical Report is based on the information available and from discussions with personnel of Arccon Mining Services and Marengo Mining limited. I am responsible for reviewing sections 1-5, 13 and 15 to 29 of the report based on information provided by Arccon Mining Services and Marengo Mining limited.
6. By applying the tests set out in Part 1.5 of NI 43-101 I am independent of the issuer.
7. I visited the Marengo Mining limited project area relevant to this technical report from the 12th through 14th April 2012.
8. I am not, nor intend to be, a director, officer or other direct employee of Marengo Mining limited or any of its subsidiaries and have no material interest in the Projects or Marengo Mining limited. My relationship with Marengo Mining limited is solely one of professional association between client and independent consultant. The review work and this Technical Report are prepared in return for professional fees based upon agreed commercial rates and the payment of these fees is in no way contingent on the results of this Report.
9. The Technical Report has been compiled based on information available up to and including the date of this Report. I have given my consent for the distribution of this report in the form and context in which it appears.
10. I do not own or expect to receive an interest (direct, indirect or contingent) in the property described herein, nor in the securities of Marengo Mining limited.

Paul J Kreppold BEng(Hons) MEngst LLB FIE(Aust) CPEng

Original signed at Perth, Western Australia this 16 May 2012