

# Exploration – where to next?



Harmony's exploration programme in FY07 concentrated on PNG, Australia and Africa. It was a successful period, most notably in the highly prospective country of PNG. It is worth singling out the Biamena prospect, which is in close proximity to Wafi/Golpu, where preliminary results for surface sampling are outstanding, and to the diamond drilling programme on the Western Zone near Wafi. In Australia, initial drilling beneath the Eastern Jaspilite pit at Mt Magnet yielded some spectacular intercepts.

Our exploration initiatives are divided into two categories: greenfields and brownfields.

- Greenfields exploration is the search for new mining opportunities where infrastructure (processing plants, roads, power) would be required should the decision be taken to establish a new mine. Exploration is carried out in-house or in joint venture partnerships.
- Brownfields exploration takes place near operating mines where existing infrastructure can be used to exploit any new orebodies.

Harmony has exploration 'filters' to ensure that efforts are focused on targets of a meaningful size. For example, if the company were to consider constructing a new mine, we would expect production of more than 200 000oz of gold a year, low cash costs (less than US\$350/oz) and a life of mine of not less than 10 years.

Apart from the nature of the orebodies and infrastructure (existing and required), Harmony's growth strategy is shaped by long-term views of the gold market and project- and country-related risks.

## Australia

Harmony is in discussions with a number of parties to dispose of the Mt Magnet operation in Australia. After the close of the financial year, Harmony entered into an agreement with Dioro Exploration NL and other interested parties for the sale of its South Kal mines and its nickel and non-nickel tenements in Western Australia. It is Harmony's intention to dispose of all its Western Australia assets.

## PAPUA NEW GUINEA

PNG is considered to have very significant geological potential and Harmony's lease holding to the south-west of Lae in the province of Morobe is substantial (3 480km<sup>2</sup>) and one of the most prospective on the mainland. The tenements fall into three main blocks:

- the Wafi/Golpu leases (440km<sup>2</sup>);
- the Morobe-Hidden Valley leases (971km<sup>2</sup>); and
- the Morobe Coast EL (2 069km<sup>2</sup>).

The tenements cover a portion of the New Guinea Mobile Belt, comprising a tract of metamorphosed Lower Jurassic and Cretaceous sediments and obducted oceanic crust, which has been intruded by tertiary granodiorite, tonalite and porphyry units.

Resource estimates for Wafi/Golpu and Hidden Valley have outlined mineralised material containing some 14.8 million ounces of gold, 47 million pounds of molybdenum, 3.9 billion pounds of copper, and 89Moz of silver. Outside of the known resource areas the tenements, which are under-explored, are highly prospective for

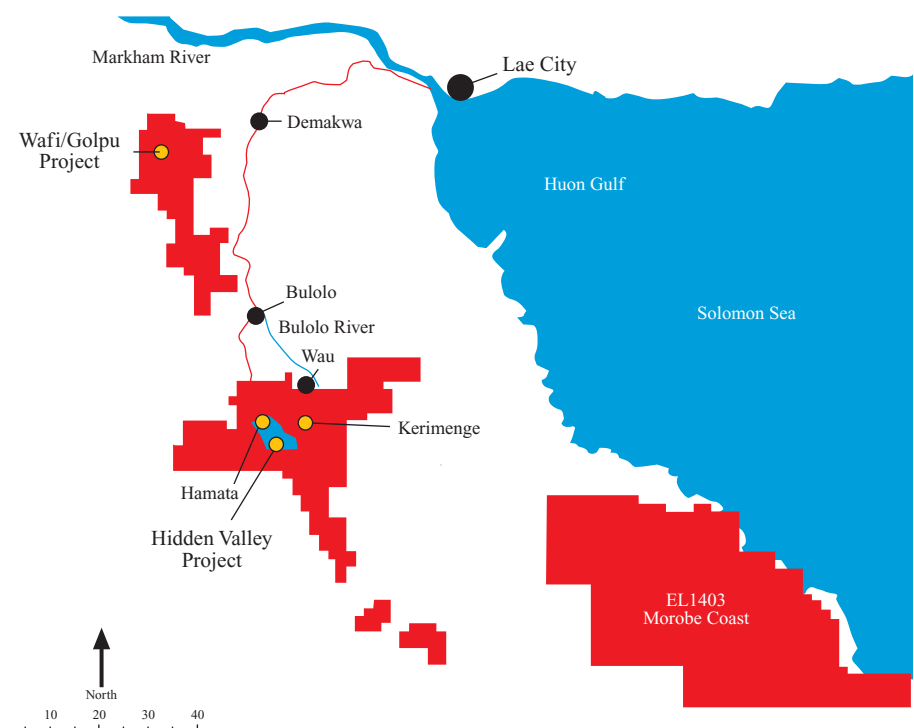
epithermal- and porphyry-related gold mineralisation.

During FY07 much work was done reviewing and upgrading systems, working teams and communications, to give Harmony a strong base for its exploration activities in PNG. The potential for organic growth through successful exploration is high.

A budget of A\$15.6 million for exploration in PNG – 70% for greenfields and 30% for brownfields activities – has been approved for FY08.

### Wafi/Golpu

The potential of the Wafi/Golpu project, comprising gold and copper-gold, is vast. A pre-feasibility study which started at the beginning of FY06 reached a major milestone with the completion of the Golpu studies in July 2007. The Wafi/Golpu pre-feasibility studies are due for completion in November 2007. The study tested the viability of the Wafi/Golpu resource and identified an economically viable project with a probable ore reserve of 70.8Mt grading 1.13% copper, 0.61g/t gold and 121ppm molybdenum.



**WAFI BROWNFIELDS EXPLORATION**

Exploration within a 1km radius of the existing deposits at Wafi and Golpu remains focused on adding high-grade underground or surface oxide resources. Prospects include the Western Zone, Nambonga North and Hesson Creek.

**Western Zone**

In FY07 a nine-hole drilling programme of 3 797m was undertaken. The highlights were:

WR204	21m @ 10.1g/t from 316m
WR207	9m @ 5.9g/t from 389m
WR219	26m @ 7.1g/t from 234m
	5m @ 13.1g/t from 311m
	6m @ 8.3g/t from 320m
WR229	5m @ 5.4g/t from 374m
WR230	14m @ 4.2g/t from 293m
WR234	30m @ 6.68g/t from 279m

The results show that the mineralisation, which is more complex than originally

thought, is structurally controlled and hosted entirely in metasedimentary rocks of the Owen Stanley metamorphics. It is similar in style to the Link Zone which is situated approximately 400m to the south. There is potential for a high-grade deposit, yielding a resource in excess of 500 000oz, and systematic step-out drilling is continuing.

**Hesson Creek**

The Hesson Creek anomaly is situated several hundred metres south-south-east of the A Zone resource. It is localised on a north-north-west splay fault associated with the Wafi Transfer structure. Gold mineralisation is associated with quartz veins stained with iron oxides and hosted in altered metasediments.

Rock-chip sampling obtained long low-grade intervals of gold anomalism from quartz-  
alunite-dickite-kaolin alteration zones.

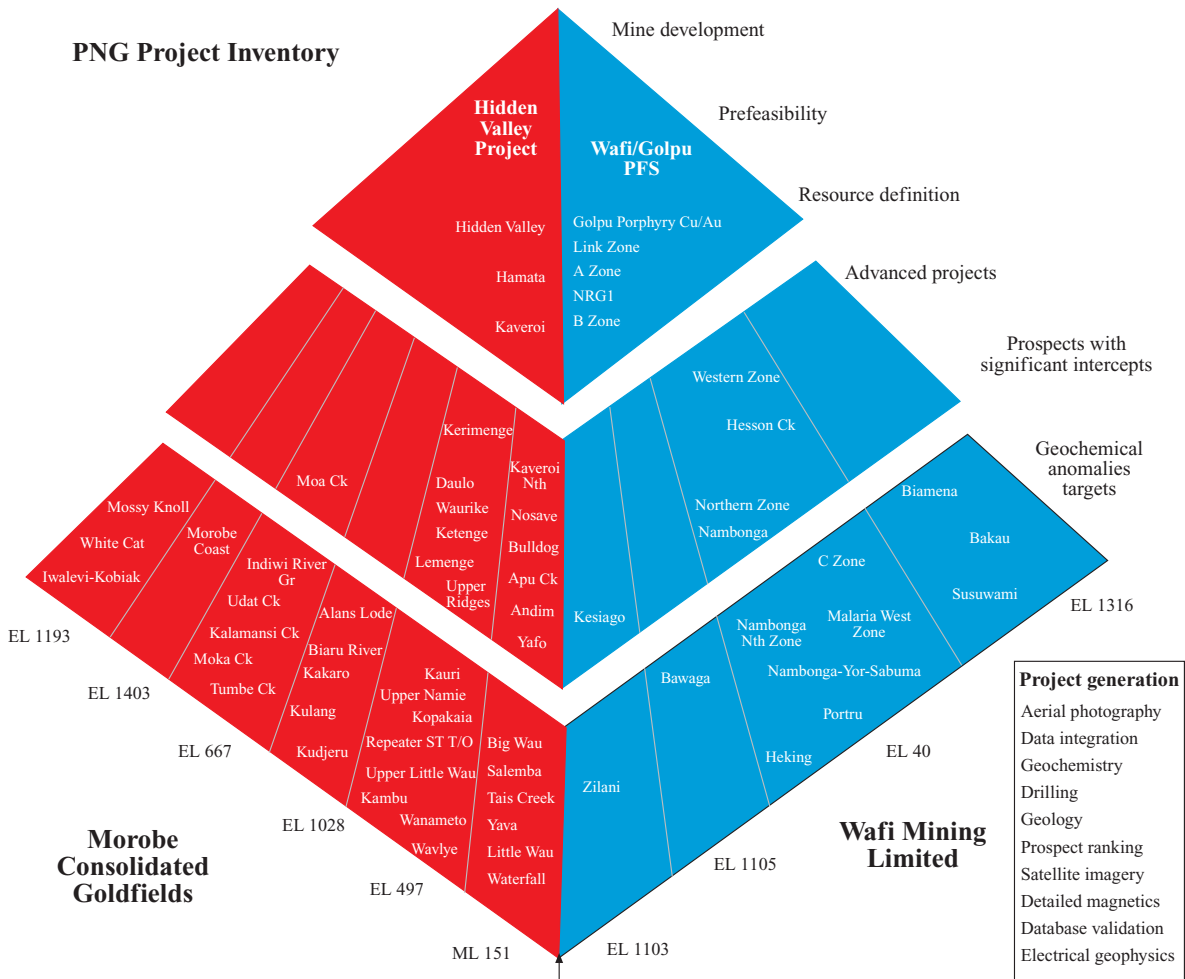
A north-north-west trending linear zone of 100m by 500m with in excess of 0.5 g/t Au in soil sampling was delineated. Two holes were drilled by CRA Exploration (Pty) Ltd off the northern end of the anomaly to test the surface mineralisation. One of these holes, WR143 returned 62m @ 2g/t Au (This includes 10m @ 4.3g/t Au). Follow-up work on this anomaly is planned for FY08.

**WAFI GREENFIELDS EXPLORATION**

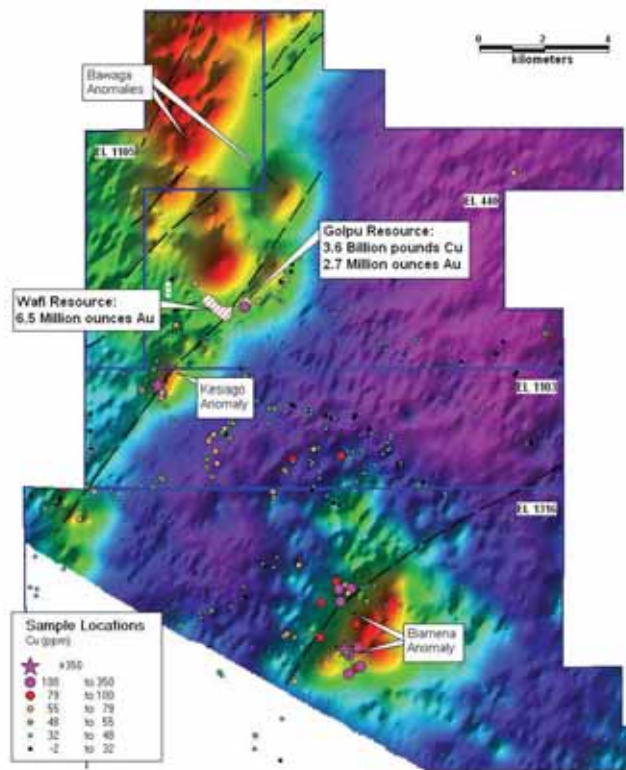
Three prospects – Biamena, Bawanga and Kesiago – in the Wafi region have the potential to deliver ‘Wafi/Golpu’-type mineralisation.

**Biamena**

The Biamena deposit is situated 12km to the south-south-east of Wafi and is prospective for epithermal gold and porphyry copper-gold mineralisation. Anomalous copper and gold stream sediment samples were first collected in the



## Location of Wafi/Golpu and high priority exploration targets



area in 1984, but there had been little exploration work to find the source of the anomaly until Harmony first started exploring here during FY07. Due to the rugged terrain, activities in the area require helicopter support throughout.

Recent work by Harmony has included mapping, ridge and spur soil sampling (545 samples), and three line kilometres of manual trenching.

Soil sampling has defined a roughly circular gold anomaly (more than 0.1g/t), about 1km in diameter and open to the south. The anomaly exhibits a classic porphyry copper metal (values ranging between 100ppm and 0.18%) zonation with elevated lead, zinc and manganese values forming concentric zones around the central copper-gold core.

Results from channel sampling of the trenches have produced some excellent mineralised intercepts at surface, including:

Trench 3	15m @ 24.4g/t Au; 1.4% Cu
Trench 5 (W)	12m @ 3.1g/t Au; 0.14% Cu
	6m @ 2.9g/t Au; 0.1% Cu
	14m @ 4.6g/t Au; 447ppm Cu
	6m @ 17.3g/t Au; 345ppm Cu
Trench 5 (E)	6m @ 7.6g/t Au; 0.12% Cu
	8m @ 3.5g/t Au; 0.17% Cu
Trench 7	6m @ 7.6g/t Au; 861ppm Cu
	5m @ 16.9g/t Au; 0.7% Cu
Trench 8	5m @ 6.5g/t Au; 697ppm Cu

Work on the prospect is at a very early stage. Mapping has shown that the high-grade zones in trenches 3 and 8 are structurally controlled, and accompanied by strong to intense pervasive potassic alteration. The main mineralised fault zone strikes north-west and is being targeted for porphyry-related copper-gold mineralisation at depth.

A ground-based electromagnetic survey, an induced polarisation survey and ground

magnetics are planned to outline porphyry targets at depths of up to 500m below surface. Grid-based geochemistry and mapping will also be undertaken. Initial drilling on the prospect is now under way and will be expedited to test high-grade trench and surface geochemical results.

### Kesiago

The Kesiago anomaly, which covers an area of approximately 3km<sup>2</sup>, is situated 2.5km to the south-west of the Wafi prospect. It is associated with the north-east/south-west-trending Wafi Transfer structure.

Stream sediment results show elevated coincident copper and gold results, similar in tenor to those obtained from the Golpu deposit. Its footprint and potential size make it the highest ranked grassroots target on the Wafi tenements.

A programme of trench sampling and mapping with follow-up drilling has been designed and is scheduled to start in the second quarter of FY08.

### Bawaga

This area is prospective for epithermal gold and porphyry copper-gold similar to that of the Wafi/Golpu system. It is a priority for follow-up work given its structural setting with north-north-west trending transfers, magnetic anomalies that suggest porphyry intrusives and the lack of previous exploration in the area.

### Other prospects

Magnetics have also shown a number of favourable structural environments with the potential for major gold or copper-gold systems in areas in the Wafi region where there has been little or no previous exploration. First-pass exploration – stream sediment sampling, mapping and reconnaissance rock chip sampling – is planned for these areas in order to identify new prospects.

## HIDDEN VALLEY BROWNFIELDS EXPLORATION

There are a number of opportunities in the relatively under-explored Hidden Valley mining lease area which could provide additional resources to increase the life of the Hidden Valley mine. These include the

Big Wau, Salemba, Bulldog North and Yafo prospects.

Exploration work planned for the first half of FY08 on the Hidden Valley mining lease includes mapping and sampling of new exposures (developed as part of the mine construction), solid geology interpretation, and blanket ridge and spur surface geochemistry. These base datasets will be integrated with detailed helicopter-borne magnetics. The Hidden Valley mine lease targets will then be ranked and prioritised for drill testing in the second half of FY08.

### MOROBE-HIDDEN VALLEY GREENFIELDS EXPLORATION

The Morobe area hosts the Hidden Valley and Hamata resources which are situated in the centre of several major high-tenor stream-sediment gold anomalies. There are a number of prospects such as Kerimenge, Kauri, Heyu, Moa Creek and Upper Ridges. In FY07 the focus was on Kerimenge.

#### Kerimenge

The Kerimenge deposit lies approximately 6km to the north-east of Hidden Valley and 7km to the east of the proposed Hamata processing plant site. Rock-chip sampling outlines a larger geochemical signature than Hidden Valley but most historical drilling has focused on the main Kerimenge mineralisation zone. There are a number of opportunities to significantly expand the size of the deposit along strike and down dip, and for different styles of mineralisation associated with cross-cutting lodes. Kerimenge presents an opportunity to convert resources (there is potential to define more than 1Moz of gold) that are accessible using infrastructure developed for Hidden Valley.

Gold mineralisation occurs with disseminated pyrite and arsenopyrite in hydrothermal breccia and with quartz-veined stockwork in Andesite porphyry. Drilling targeted gold mineralisation on the southern extension of the Kerimenge Fault, over a strike of 400m and amounted to 11 holes for 1 671m during the year. Significant intercepts include:

QD129	6m @ 5.0g/t Au from 51m
QD130	21.5m @ 2.7g/t Au from 5m
QD131	7m @ 3.9g/t Au from 74m
QD134	20.0m @ 1.6g/t Au from 153m
QD135	19m @ 4.1g/t Au from 49m
QD136	5.4m @ 51.7g/t Au from 101m

Of particular importance is the drill intercept obtained in QD136 because the mineralisation occurs in brecciated metasediments in the footwall of the fault. This represents a new style of high-grade mineralisation, previously unknown at this prospect. Work on strike and depth extensions is ongoing. In addition, potential for further tonnage exists on the north-west trend where QD85 encountered 32.1m @ 8.3g/t Au from 168m.

Compilation of historical exploration data around the broader Kerimenge prospect has shown a number of high-grade trench results which have not been followed up with drilling. These trench results are broadly coincident with limestone contacts and mapping and drill testing is planned for FY08.

#### Kauri

The Kauri prospect lies about 9km to the north-east of the Hidden Valley deposit and represents a major centre of more than 1g/t sediment anomalism. The footprint of the anomaly is in excess of 2.5km and is similar in tenor to the anomaly that led to the discovery of the Hidden Valley deposit.

A programme of follow-up stream sediment sampling, ridge and spur soil sampling, and follow-up trenching and mapping has been planned and scheduled for the first half of FY08. The intention is to define drill targets for testing in the second half of FY08.

#### Heyu

The Heyu prospect is situated approximately 7km north-west of the mill site at Hamata. The recently constructed access road to the Hidden Valley mine can be used by all those involved in exploration at Heyu where previous programmes had to be supported by helicopters.

The Heyu stream sediment anomaly is of a high order with over 4km of strike. It

is associated with the Upper Watut Fault, which is the extension of the same structure that hosts the Hidden Valley deposit, situated some 12km along strike to the south-east.

Work at Heyu during FY07 has included mapping and rock-chip sampling of new exposures in the mine access road. The results have been encouraging with assays of up to 5.4g/t Au obtained from a fractured, quartz-veined porphyry. The road mapping forms part of an extended programme to determine the source of a major (in excess of 1.0g/t Au) stream sediment anomaly.

The broader prospect area also includes the strike extensions from the historic Edie Creek lodes. The resource potential with the existing mine infrastructure makes this a priority target for additional mill feed for Hidden Valley.

The FY08 work programme includes infill stream sediments, mapping and rock-chip sampling. About 1 600m of follow-up diamond drill testing is scheduled for the second half of that year.

#### Moa Creek

Work at Moa Creek (located approximately 15km west-south-west of the Hidden Valley deposit) was scheduled to wind back during FY07. However, a landslide exposed a mineralised hydrothermal breccia and subsequent trench sampling yielded 35m @ 3.3g/t Au. Mapping suggested that the mineralised breccia has a potential strike in excess of 1km. The prospect has the potential to deliver a major stand-alone gold orebody.

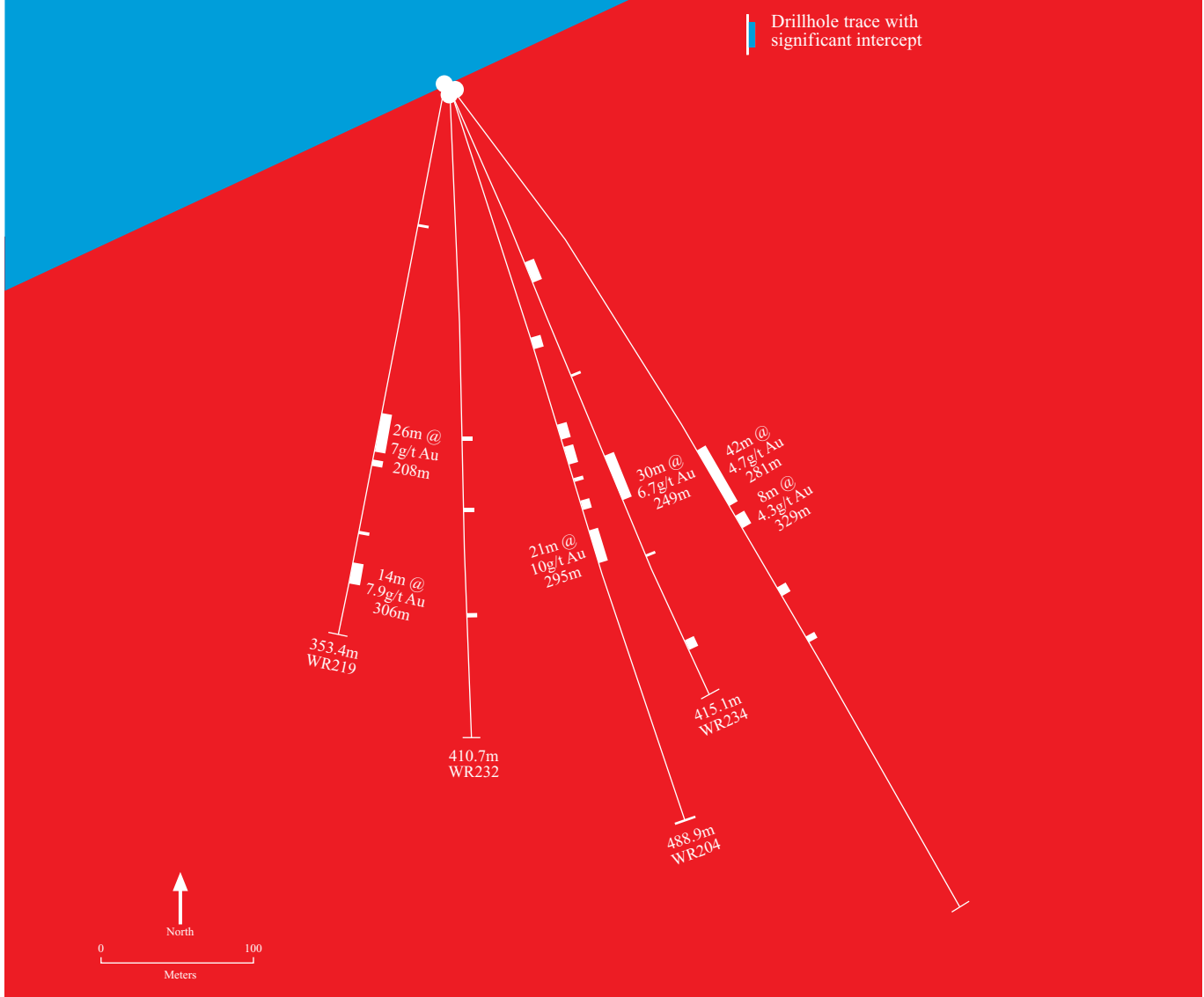
Trench sampling has recently been completed to scope out the hydrothermal breccia. Provided results are encouraging, the follow-up work scheduled for FY08 includes diamond drilling, and further mapping and stream sediment sampling over the broader Moa Creek area.

### MOROBE COAST

The Morobe Coast exploration licence covers some 2 069km<sup>2</sup>. The area lies to the south-east of the Morobe goldfield and presents exciting grassroots exploration potential. It is targeted for major (in excess

Wafi/Golpu Project  
Western Zone Diamond Drill Section  
showing significant gold intercepts  
Section 20700N ( $\pm 25.0\text{m}$ )  
looking north

- Drillhole collar
- Drillhole trace with significant intercept



of 1Moz) epithermal gold and porphyry-related copper-gold deposits.

Earlier exploration work was limited but it returned anomalous gold assays in rock-chip and stream sediments samples from the Lokaniu volcanics. There was no follow up to determine the hard rock source and no drill testing was undertaken on the tenement.

#### Giu

The Giu prospect is situated some 10km south-west of the Morobe township on the east coast of PNG. The prospect is a district-scale anomaly, 20km in diameter, with

elevated gold rock-chip and stream sediment geochemistry. The aim of the current exploration programmes is to identify and develop prospect areas with the potential for stand-alone gold orebodies with related metals present.

During FY07 results from the first-pass stream sediment sampling have outlined an area of more than 10km<sup>2</sup> with highly anomalous gold stream sediment geochemistry. Stream sediment samples taken from drainages within this anomalous zone assay in excess of 0.46g/t. Mapping to date has outlined several areas

of structurally controlled epithermal vein mineralisation hosted in vesicular basalts. Rock-chip samples have been encouraging with anomalous values of copper, gold, molybdenum and zinc returned. The maximum gold copper, molybdenum and zinc returned were: 13.9g/t Au, 1.25% Cu, 0.05% Mo and 0.89% Zn.

Fieldwork continues and includes stream sediment sampling and the excavation of trenches over outcropping mineralised zones. Systematic stream sediment coverage is scheduled for completion by the second quarter of FY08.

# WAFI/GOLPU PROJECT

**LOCATION: Morobe Province, Papua New Guinea**

## Project description:

The Wafi/Golpu project encompasses four contiguous exploration licences held by Wafi Mining Limited and covering 440km<sup>2</sup>. The Wafi complex consists of two separate orebodies, a gold only resource and a copper-gold resource (the Golpu resource), located in close proximity to each other.

Drill testing at the four main zones at Wafi/Golpu has indicated the presence of significant gold within a mostly high

sulphidation zone and a pre-feasibility study is currently underway. The resources falling within the ambit of the pre-feasibility study are:

- Golpu: a copper-gold porphyry resource
- Link Zone: a high-grade refractory gold resource contained within the large, lower grade B Zone resource.
- NRG1 (non-refractory gold): a low-medium grade gold resource in the fully and partially oxidized zones of the refractory A and B Zone deposits which

is amenable to conventional cyanide leaching.

Of these, the Golpu deposit has by far the highest value, while the Link Zone and NRG1 deposits are considered to have the potential to add value to the overall project with the realization of synergies which become available through the mining of multiple ore bodies.

## Key statistics

### NRG1 and Link Zone

Expected annual gold production (five years)	200 000oz
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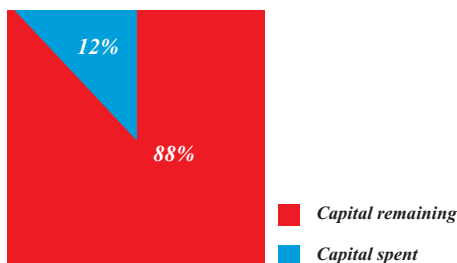
### Golpu

Expected annual copper production	90 000oz 150Mlb (Gold as credits in copper concentrate)
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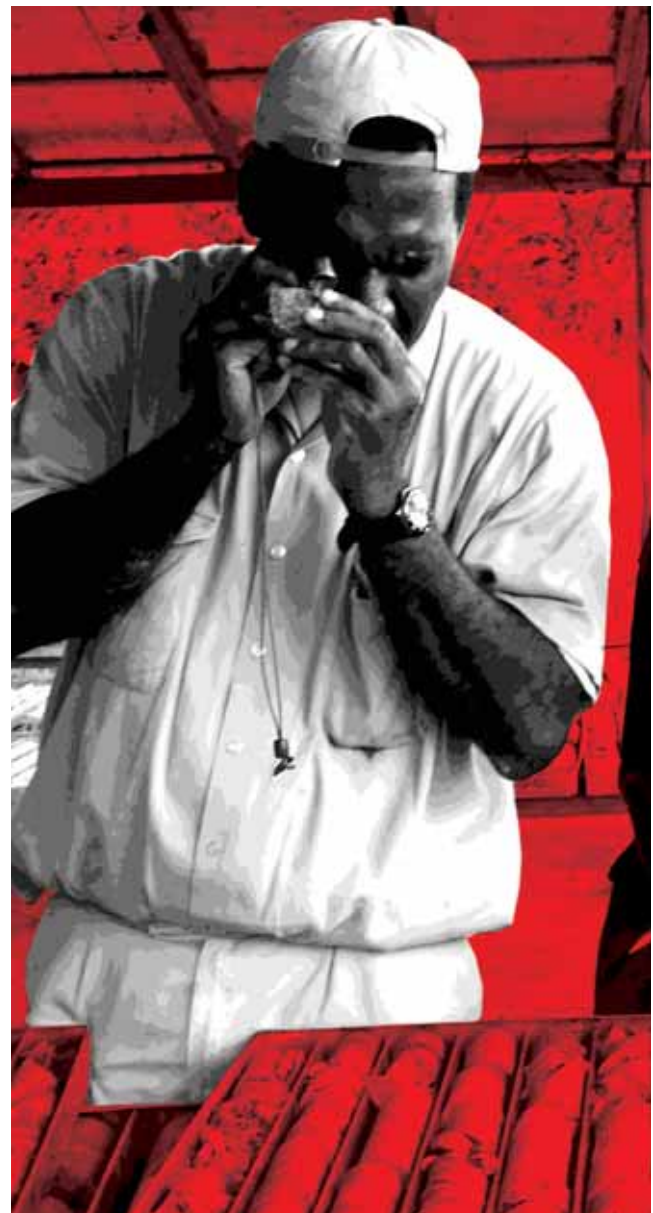
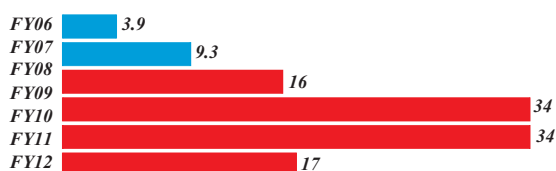
## Key dates

Pre-feasibility study began	Mid-2005
Pre-feasibility study to be completed	October 2007
Definitive feasibility study to begin	FY08
Production to begin	FY13

Wafi/Golpu: Capital expenditure to date (%)



Wafi/Golpu: Capital expenditure (US\$m) for pre-feasibility and feasibility studies



## Project progress during the year

### Pre-feasibility study

The major pre-feasibility study under way at the Wafi project is nearing completion. The study, which began in August 2005, is scheduled to be finalised in October 2007 and has considered all aspects of developing an operation at Wafi including:

- geology;
- mining (including geotechnical and hydrological considerations);
- mineral processing;
- infrastructure requirements (both on site and off site);
- environmental issues;
- community and external relations issues; and
- product marketing.

On completion, the pre-feasibility study will be submitted to the Harmony board with the definitive feasibility study scheduled to begin in the second half of FY08.

### Geology, assay results and resource modelling

The pre-feasibility study drilling program, which lasted from October 2005 until November 2006, included the drilling of 12 holes for 6 800 metres at Golpu, and 23 holes for 5 070 metres in the Link and NRG1 Zones. The program was completed approximately four months later than originally planned because of:

- the late arrival of the new drilling rigs required for the deep-hole drilling at Golpu and
- the poor drilling conditions experienced at depths of more than 800 metres.

The NRG1 and Link Zone drilling programs began in November 2006 (on completion of the Golpu program), and were concluded at the end of FY07.

Drilling within the Golpu resource confirmed the suitability of the existing resource, with only minor changes identified during the re-modelling process. The most notable change to the Golpu resource model was the addition of 12 million tonnes @ 0.7%Cu, and 0.5ppm Au in the metasediment resource which surrounds the porphyry body. The current Golpu resource is detailed in the table below.

Results of drilling obtained in the NRG1 and Link Zone resources to the end of FY07 are not sufficient to commence re-modelling of the deposit. A new model for the resources will be generated upon completion of the drilling campaign. The current NRG1 and Link Zone resources stand at:

#### NRG1: Resources at 0.8 g/t gold cut-off

Resource Category	Tonnes (Mt)	Au	Moz Au
Indicated	8.07	1.46	0.38
Inferred	9.40	1.86	0.56
Total	17.48	1.68	0.94

#### Link Zone: Resources at 0.8g/t cut-off

Resource Category	Tonnes (Mt)	Au	Moz Au
Indicated	4.28	8.57	1.18
Inferred	0.51	6.53	0.11
Total	4.79	8.35	1.29

The current resources for Golpu, Link Zone, and NRG1 are in addition to the greater A and B zone resources, which contain an additional 83Mt @ 1.5g/t for 4.1 million ounces. Given the relatively low grade and refractory nature of the deposits, the A and B Zone resources were not included in the current pre-feasibility study. It is hoped that suitable processing methods will be identified to make the exploitation of the latter resource financially viable as the project progresses.

#### AB Zone: Resource at 0.8g/t cut-off

Resource Category	Tonnes (Mt)	Au	Moz Au
Indicated	51.71	1.45	2.41
Inferred	31.07	1.69	1.69
Total	82.79	1.54	4.10

Both the Golpu copper-gold resource model and Wafi gold (incorporating AB Zone, Link Zone, and NRG1) have been reviewed and endorsed by RSG Global and SRK consultants, and both resource models are JORC and SAMREC compliant.

### Mining studies

Mining studies, conducted following the drilling program, for the Golpu, Link Zone and NRG1 deposits were completed by external consultants under the guidance of the Harmony project team. The Golpu mining study is at a pre-feasibility level of definition, while the Link Zone and NRG1 studies remain at conceptual level.

Detailed geotechnical logging of all core data collected in the drilling program has taken place, along with hydrological testing including packer testing, falling-head testing, and the monitoring of piezometers installed in selected bore holes. The geological setting at Golpu is complex and additional information (especially structural) is required for the definitive feasibility study. However, the data collected to date has been sufficient to select block caving as the preferred mining method, and to set base parameters for mine design, including excavation, ground support, and infrastructure requirements, and cave modelling.

The mine plan for Golpu has been reviewed and approved by internationally recognised block caving experts. Consensus is that a decline excavation

#### Golpu: Current resource

Class	Mt	Cu %	Au ppm	As ppm	Ag ppm	Mo ppm	Fe ppm	Cu Metal Kt	Au Moz	
Porphyry	Indicated	87.62	1.39	0.63	431	1.66	110	81,752	1,220	1.77
	Inferred	4.27	1.52	1.03	15	2.11	66	44,596	65	0.14
	Subtotal	91.90	1.40	0.65	412	1.68	108	80,024	1,285	1.91
Peripheral Mineralisation	Inferred	71.21	0.67	0.46	269	1.38	162	80,439	479	1.05
<b>Total</b>	<b>Indicated &amp; Inferred</b>	<b>163.11</b>	<b>1.08</b>	<b>0.56</b>	<b>350</b>	<b>1.55</b>	<b>132</b>	<b>80,205</b>	<b>1,763</b>	<b>2.96</b>



**Golpu: mining inventory**

		Tonnes (million)	Cu %	Au (g/t)	Mo (ppm)	As (ppm)
Indicated	Lift 1	39.3	1.30	0.56	120	213
	Lift 2	15.1	1.40	1.00	133	27
	Subtotal	54.4	1.33	0.68	124	162
Inferred	Lift 1	18.8	0.64	0.47	202	81
	Lift 2	11.8	0.68	0.57	163	23
	Subtotal	30.6	0.66	0.51	187	59
Unclassified	Lift 1	7.5	0.00	0.00	0	0
	Lift 2	8.2	0.38	0.20	61	103
	Subtotal	15.8	0.20	0.11	32	54
<b>Total</b>		<b>100.7</b>	<b>0.95</b>	<b>0.54</b>	<b>129</b>	<b>133</b>

**Golpu: probable reserves**

		Tonnes (million)	Cu %	Au (g/t)	Mo (ppm)	As (ppm)
Indicated	Lift 1	38.3	1.30	0.56	120	212
	Lift 2	15.3	1.42	1.01	131	27
	Subtotal	53.6	1.33	0.69	123	159
Inferred	Lift 1	6.5	0.52	0.33	142	91
	Lift 2	5.2	0.70	0.60	148	22
	Subtotal	11.6	0.60	0.45	145	61
Unclassified	Lift 1	3.1	0.00	0.00	0	0
	Lift 2	2.5	0.69	0.37	108	143
	Subtotal	5.6	0.30	0.16	48	63
<b>Total</b>		<b>70.8</b>	<b>1.13</b>	<b>0.61</b>	<b>121</b>	<b>136</b>

should be undertaken in subsequent feasibility studies so as to confirm mining parameters prior to commitment to construction of the mine.

The optimal mining inventory includes mining of inferred resources. The mining inventory for Golpu is presented in the table above.

To determine the effect of not including the inferred material in determining the cave footprint, a separate caving analysis was completed. This analysis assigned zero economic value to Inferred material in order to establish mining volume for the reserve, and grade was then used to determine the estimated metal grades inclusive of dilution. The results of this analysis are shown in the table above.

Subsequent financial analysis of the results of the outcome of the reserve mining scenario confirmed that the mine is profitable at assumed metal prices (Copper \$2.30/lb, Gold \$520/oz, Molybdenum \$20/lb), and a probable reserve as tabled above is therefore defined.

The Golpu mine plan was completed with the minimisation of arsenic recovery as a critical factor. Block caving studies were completed to maintain arsenic grades below

300ppm to ensure that the final copper concentrate can be sold on world copper smelting markets. Should arsenic removal processes be found to be viable (see mineral processing) in the future, the mining inventory may increase by as much as 30%.

Link Zone and NRG1 mining studies were completed to an “advanced conceptual” level, giving a reasonable level of confidence in the mining plans. Mining studies of these deposits for the pre-feasibility study are to be completed following an update of the Wafi gold resource model. It is expected that the Wafi gold resources have the potential to add value to the overall mine plan, but will not alter the overall viability of the project, which will be determined by Golpu. The NRG1 resource is to be mined by conventional open pit methods, while the Link Zone will be extracted using a modified underground sub-level caving mine plan.

**Mineral processing**

Mineral processing methods for the three deposits under review will be:

- Golpu – standard flotation methods to produce a copper concentrate for sale to copper smelters.
- Link Zone – whole ore pressure

oxidation followed by cyanide leaching to produce gold doré.

- NRG1 – Cyanide leaching to produce gold doré.

The focus of the pre-feasibility study was to optimise copper concentrate production for Golpu, and to develop a viable processing method for the Link Zone ore. Test work indicates that an average of 87.6% copper and 54% gold recovery to the final concentrate will be achieved.

Initial test work on the alkaline sulphide leaching process was successful in removing 95% of the arsenic, without the loss of copper from the final concentrate. This development is extremely encouraging (although only preliminary), and further work to test the economic viability of alkaline sulphide leaching (ASL) is planned for FY08.

**Infrastructure**

Design and cost estimates for all infrastructure requirements at Wafi/Golpu have been completed and the infrastructure requirements have been split into “on site” and “off site” categories. On-site infrastructure includes:

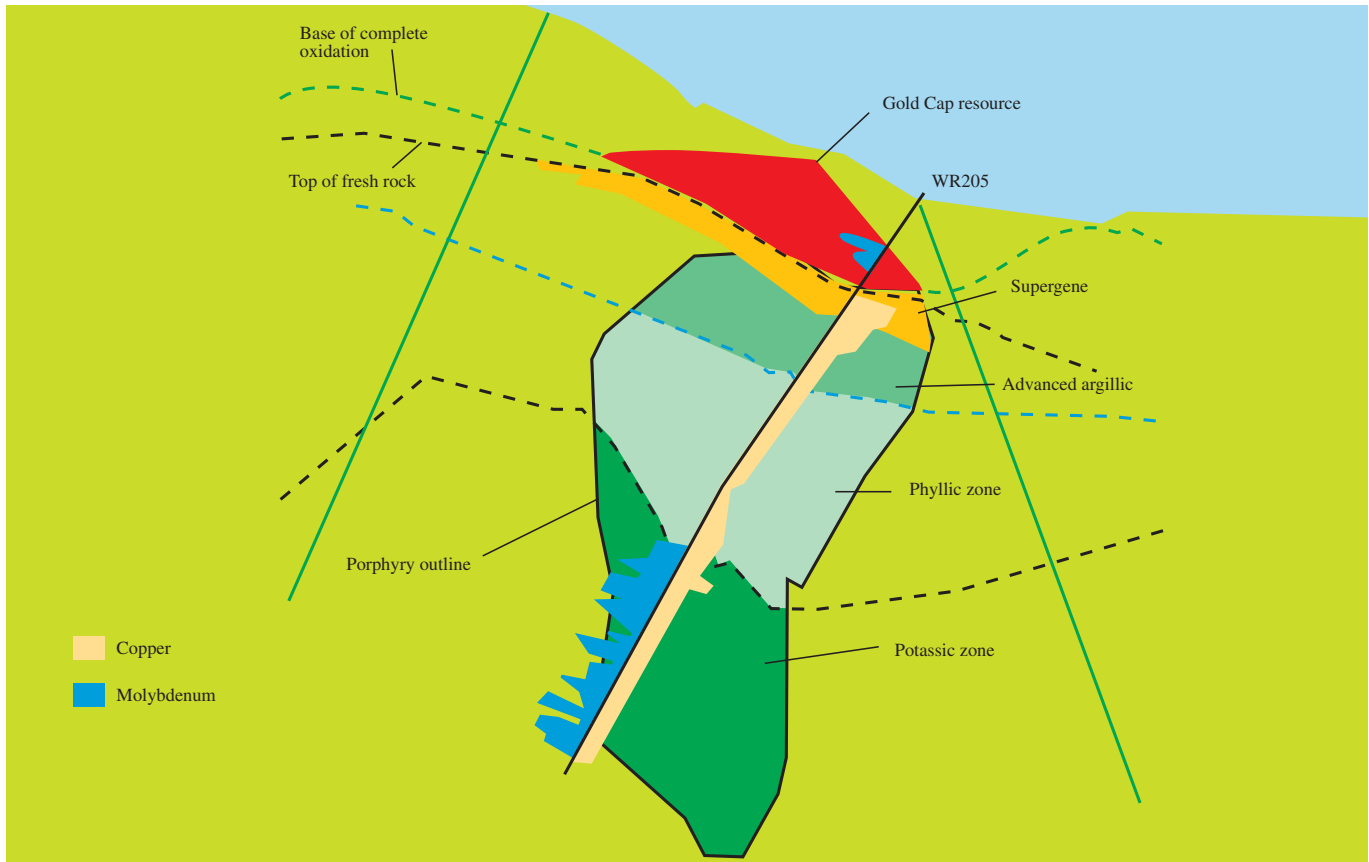
- Processing plant and associated equipment;
- Storm water management;
- Electrical distribution;
- Bulk liquid and solid handling and storage;
- Buildings;
- Site accommodation;
- Sewage treatment;
- Waste management;
- Mobile equipment;
- Communications systems;
- Security; and
- Temporary facilities.

Infrastructure designs include consideration of geotechnical and seismic activity parameters for the site. Geotechnical studies (including field work) and seismic risk assessments were completed as part of the pre-feasibility study.

Off-site infrastructure requirements include:

- site road access;
- concentrate handling to the port of Lae;
- site power supply;

**Geological domains in the Golpu model, used for identification of zones for further test work. Drill hole showing copper grade (brown) continuity through the orebody.**



- site water supply; and
- Lae port requirements.

The off-site infrastructure studies are currently completed to scoping level accuracy, with completion to pre-feasibility study level of accuracy due in November 2007.

## Forward Work Programme

It is anticipated that following completion of all PFS work (currently planned for November 2007), a single go forward option for the definitive feasibility study will be determined. It is expected that findings of the pre-feasibility study will be examined by the Harmony Board during the first half of FY08, with the start of the definitive feasibility study planned for the second half of FY08.

Given the requirement to mine a feasibility decline as part of the mine definitive feasibility study, it is expected that the duration of definitive feasibility study studies will be in the vicinity of three years. Mining of the decline and extensive diamond drilling programs will be the major physical work requirements during the definitive feasibility study.

The definitive feasibility study will examine all aspects of the project in detail, with 15 to 20% of total project deliverables planned to be completed by the end of the definitive feasibility study. The definitive feasibility study will allow a decision whether to fund development of the project.

Provided that the outcomes of studies are positive, the project is planned to be

developed immediately following the definitive feasibility study. Detailed Engineering and construction will require two to three years for completion, with first metal production from the site anticipated to be achieved during FY14.

The cost of the definitive feasibility study is expected to be approximately US\$100 million inclusive of the cost for mining the feasibility decline. The cost, which is approximately 7 to 10% of project capital, is consistent with the expenditure requirements for definitive feasibility study programs of projects of similar size and complexity.



## AFRICA

Harmony's strategy in Africa is to explore through alliances with junior exploration companies. Projects are considered at all stages of the exploration cycle, ranging from grassroots to advanced levels. Exploration is focused on areas where there is potential to discover sizeable (more than 2Moz) gold deposits that can be mined using open-pit methods. During FY07 the company continued to evaluate exploration opportunities on the continent.

In May 2007 the joint venture with Axmin Inc in eastern Senegal entered its second year. The tenement, which is 840km<sup>2</sup> in size, includes metavolcanic and metasedimentary rocks of the Birimian

Formation and partially covers the prospective Mali-Senegal shear zone. Through expenditure of US\$4 million over three years to May 2009 (US\$800 000 spent thus far), Harmony can earn a 50% interest in Axmin's land holdings. During the first year of the joint venture trenching indicated that zones with anomalous gold concentrations are commonly wider than 10m and can extend for several hundred metres along strike. The best surface gold grades encountered are 10m @ 1.9g/t, 4m @ 3.2g/t, 8m @ 1.6g/t and 4m @ 25g/t. The results of a geophysical survey suggest that gold occurrences may continue along structures and down dip. Drill targets have been firmed up and were tested during a 1 600m diamond drill programme in July 2007, before the start of the rainy season,

while work on the gold assay results continues.

The exploration boom in West Africa has resulted in a shortage of drill rigs. For this reason the joint venture intends to purchase a combined RAB/RC drill rig which should be available at the beginning of the next dry season when the systematic drill testing of the gold prospects should get under way.

## SOUTH AFRICA TARGET NORTH

The Target North resource is situated in the Central Rand Group of the Witwatersrand Sequence with the bulk of the resource accommodated in the Turfontein Sub-group.

Broadly speaking, the structural regime is an asymmetrical syncline with a steep western limb (40° to 90°). The syncline plunges approximately 9° to 10° to the north. Three major sets of structures modify the overall synclinal nature of the deposit. These comprise north-east/south-west trending normal faults which generally have down throws to the south; north-south trending normal faults with down throws to the west; and various sets of low-angle fore and back thrusts evident on the west limb.

The major formations which are of interest are the Ventersdorp Contact Reef (VCR), the Uitkyk and Van den Heeverrust members, and the Kimberley Formation. The Welkom Formation may be of minor interest.

The VCR is recognised at the base of the Klipriviersberg Group. Recent work on the VCR has significantly improved the understanding of the setting and distribution of mineralisation. It is currently believed that the VCR is best developed where it directly overlies the Elsburg A (EA) reefs. Much work is still required to develop a robust geological model for this horizon. The EA and Dreyerskuil reefs of the Uitkyk and Van den Heeverrust members are believed to be fanglomerates and arenites, which are hosted in a wedge-shaped sequence of clastic sediments, restricted to the western margin of the syncline which has a limited down-dip extension.

Significant mineralisation occurs in the Big Pebble reefs (A reefs), which straddle the base of the Earls Court Member and within the Aandenk Member. These reefs are thought to occur within a braided stream environment. In addition, the Maraisdal Reef (B Reef) is developed at the base of the Spes Bona Member overlying the Doornkop quartzite.

The Basal Reef (previously referred to as the Sun Reef) occurs as a polymictic coarse pebble conglomerate with a kerogen facies developed in the extreme south of the Sun area. There are few intersections and this horizon is poorly understood. The bulk of this horizon occurs significantly deeper than the Kimberley Formation and is not considered to be of economic importance. Drilling on the Target North

project started in August 2006. Two boreholes are currently in progress on the farms Dreyerskuil and Maraisdal. The borehole DKL10 has intersected mineralized Elsburg horizons between 2 169m and 2 412m and is currently being deflected. The intersections from this borehole are being assessed and interpreted. They seem to suggest that the Upper Elsburg reefs are mineralised in the so-called Siberia Fan area.

Several problems have been encountered with the northern borehole, MAL19, and work on this is some five to six months behind schedule.

Drilling will continue in FY08. DKL10 is scheduled for completion in the first half of FY08 and MAL19 in March 2008.

To date R9.3 million has been spent on this project with an additional R8.7 million budgeted for FY08.

## EVANDER

### The Evander 2 shaft-deepening project

The aim of the project is to explore the Kimberley Reef between 24 and 26 levels. Development of an incline shaft down to 26 level is planned in order to access the blocks of ground lying below the current infrastructure. The cross-trend to the main pay shoot has been projected into the target area.

### Poplar

The Poplar project area is situated 30km north-west of the current mining operations at Evander No 8 shaft and 120km east/south-east of Johannesburg. It is bounded in the east by the town of Leandra and in the west by the informal settlement of Eendrag. Poplar is inclusive of the Evander mining right of 36 898ha.

The economic heart of the Poplar lease area is the Kimberley Reef. It occurs at a depth below surface of between 500m in the east to 1 200m in the west. The reef strikes north-south and dips from 14° to 24° to the east. The Kimberley Reef comprises a sequence of fluvial, channel sediments that were deposited in a braided stream environment. Deposition of the reef was influenced by the footwall lithologies. The area of economic mineralisation is not continuous throughout

the Poplar lease, but the most extensive zone of mineable reef is found in the southern part of the area. The high-grade Kimberley Reef is associated with carbon and narrow, small-pebble, clast-supported and well-packed oligomictic conglomerate.

The Poplar project will include greenfields development involving the installation of a twin-shaft system to 1 200m below surface to exploit the Kimberley Reef pay shoot.

Total mineral resources are 25.6Mt at 7.6g/t in situ for a total of 194t or 6.2Moz of gold. Ore reserves are estimated at 13.5Mt at 7g/t head grade for a total of 94.3t or 3Moz of gold.

The possibility that this orebody can be linked up to the south with the Evander South project is being investigated. A linkage would result in an orebody stretching over 20km in strike length.

An exploration office was established and drilling started in January 2007. Adverse ground conditions in the form of dolomites were encountered and a new drilling contractor, with experience of such conditions, had to be appointed.

The exploration drilling will be completed in FY08 and a more comprehensive 3D geological model of the orebody will be prepared. This is expected to lead to a revised pre-feasibility study to mine the orebody.

To date, R8.3 million has been spent. An amount of R40.2 million remains for exploration at Poplar.