



EXPLORATION ACTIVITY INCREASING

At last count, there were more than 260 exploration licences in Papua New Guinea held by 79 companies from seven different countries, with a further 20 under renewal and more than 100 new licence applications.

THE COUNTRIES involved in exploration and mining are Australia, Canada, China, South Africa, Japan, Singapore and the United States, as well as PNG.

Gold remains the principal mineral commodity of interest, with copper, nickel, iron and seabed massive sulfide deposits also being targeted. Oil and gas has also created a great deal of interest.

With the first gold pour achieved in June, Morobe Mining's Hidden Valley is the first new gold mine to be commissioned on mainland PNG for 15 years. Hidden Valley has been engineered for an

ore throughput of 4.2 million tonnes per annum from the Hamata. Hidden Valley and Kaveroi orebodies, with peak annual production scheduled at 275,000 ounces in 2019.

Joint venture partners are Harmony Gold Mining and Newcrest Mining.

Brisbane-based Australian explorer Coppermoly has signed an agreement with Barrick (PNG Exploration) Limited, a subsidiary of Barrick Gold, on a major copper-gold-molybdenum project on the island of New Britain, following an extensive exploration campaign.

The project involves three tenements at Simuku, Mt Nakru and Talelumas, which are all on the same

northwest-southeast geological trend running across the island and within driving distance of the deepwater port at Kimbe, the provincial capital of New Britain.

Barrick has made a minimum commitment of \$A3 million within the first 24 months, plus a share placement of about 5% of Coppermoly's share capital. Barrick can earn 72% by sole funding \$20 million in the project.

Once Barrick has earned 72%, Coppermoly can choose to fund its 28% share of further costs up to the completion of a feasibility study from 50% of its share of the revenue once the projects are in production.



Meanwhile, expenditure on the Ramu nickel-cobalt laterite project in Madang province had reached \$US930 million by mid-year, out of a total capex cost of nearly \$1.4 billion. MCC Ramu NiCo, effectively a subsidiary of China Metallurgical Group Corp, which bought the Cape Lambert iron ore venture in Western Australia for \$A400 million about 15 months ago, controls the project through its 85% shareholding.

Another Australian Securities Exchange-listed company, Highlands Pacific owns 8.56% of the project; Mineral Resources Ramu, a subsidiary of PNG's state-owned Mineral Resources Development Corp, has 3.94%; and landowner company Mineral Resources Madang 2.5%.

Highlands Pacific is in a joint venture with Xstrata and Japan's Overseas Minerals Resources Development at the Frieda River copper-gold project. With a prefeasibility study already underway, a \$US36 million infill drilling program on the Horse-Ivaal-Trukai section of the project has shown porphyry mineralisation extending to more than 600 metres in depth.

Construction completion and commissioning are scheduled for the end of this year, with annual production targeted at 31,150 tonnes of nickel and 3300t cobalt over an initial 20-year life. Construction of the key component of the project, the 135km-long slurry pipeline from the Kurumbukari mine to the processing plant on the coast at Basamuk, has been completed and all of the major plant components delivered.

Not only are these new projects nearing completion, but some of the country's existing mines are at various stages of expansion or life-extension studies. Lihir Gold, for example, is currently working on its "million ounce plant upgrade" project, while at Porgera, Barrick Gold Corp is exploring around the existing operation and at depth to identify resources that could extend the mine's remaining 13-year life.

The Lihir project aims to increase the mine's output to around 1 million ounces a year from 2012 for the remainder of its life. The operation produced 771,000oz last year, and more than 7Moz since it came onstream in 1997.

Barrick reported success in increasing resources underground at Porgera during 2008, and current reserves are sufficient to support mining both on surface

and underground until 2017. The company is also continuing with its Porgera Deeps program, exploring the intersections of proven gold-bearing structures below the current underground infrastructure.

Meanwhile, with open pit closure scheduled for 2013 at Ok Tedi, new efforts are underway to find additional resources within the locality. A prefeasibility study on moving to underground mining began last year, with a feasibility study scheduled for completion in 2010.

On Woodlark Island, Woodlark Mining is reported to have identified a 1Moz-plus resource at its namesake project, with additional drilling conducted to improve the resource estimate.

Allied Gold commissioned its mine on Simberi Island in February last year, with the operation having produced 100,000oz of gold by mid-2009. The company has been able to increase its total resource there to 4.7Moz of gold and 10Moz of silver.

Elsewhere, Barrick has started work on its earn-in commitments over Allied's copper and gold prospects on Tatau and Big Tabar islands. The company also spent \$US10 million on exploration at its own Kainantu property in the Eastern Highlands during 2008, plus a further \$US27 million on mine development.

Although gold and copper have formed the foundation for PNG's mining industry in the past, the country's mineral endowment is far more extensive. The prospect of diversification has led a number of companies to begin evaluating a range of other mineral resources, including chromite, nickel, platinum group metals and industrial minerals.

At Wowo Gap in eastern Papua New Guinea, Resource Mining Corp (through Niugini Nickel) is continuing to evaluate laterite nickel-cobalt resources, having recently completed a revised resource estimate for the project.

Chromite has been the target for OM Holdings, with the company having completed a limited drilling program on its Salamua prospect in Morobe province.

Papuan Precious Metals has a number of active projects, targeting variously platinum, palladium, nickel, chromite, gold and copper at its Doriri Creek, Urua Creek, Dimidi Creek, Upper Ada'u River, Goroa Creek and New Hanover prospects in Oro province.

MIL Resources, working on Titan Mines' iron sand prospects at Amazon Bay, has reported the



presence of vanadium in heavy-mineral concentrates from sampling there, while the company is also prospecting for gold and copper at its nearby Poi licence area.

An interesting project is Nautilus Minerals' Solwara 1.

The company plans to mine gold, copper and silver from a depth of 1600m from PNG territorial waters, but has delayed construction of equipment due to "market conditions".

Other Australian companies with exploration interests in Papua New Guinea include Marengo Mining, Cue Energy Resources, Minerals Corporation, Mosaic Oil, New Guinea Energy and Oil Search.

Small-scale alluvial gold mining is an important source of income for rural communities and the PNG Mineral Resource Authority's small-scale mining branch has been commissioned to manage this industry. The branch is training rural people about good and effective practices in alluvial mining to encourage good commercial practice, minimise or eradicate illegal gold exports and eliminate health and environmental risks.

Antelope 2 recorded the world's biggest gas flow



Because of a lack of exploration activity and a projected decline in oil production from the Kutubu, Gobe and Moran oil fields between 2003 and 2010, the PNG government introduced special fiscal terms described as "incentive rate petroleum operations".

Incentive rate petroleum operations will be subject to a revised income tax of just 30% of taxable income. This is a significant decrease from normal petroleum operations, the income of which is currently assessed at 50% of taxable income for petroleum projects established prior to January 1, 2001, and 45% for projects thereafter.

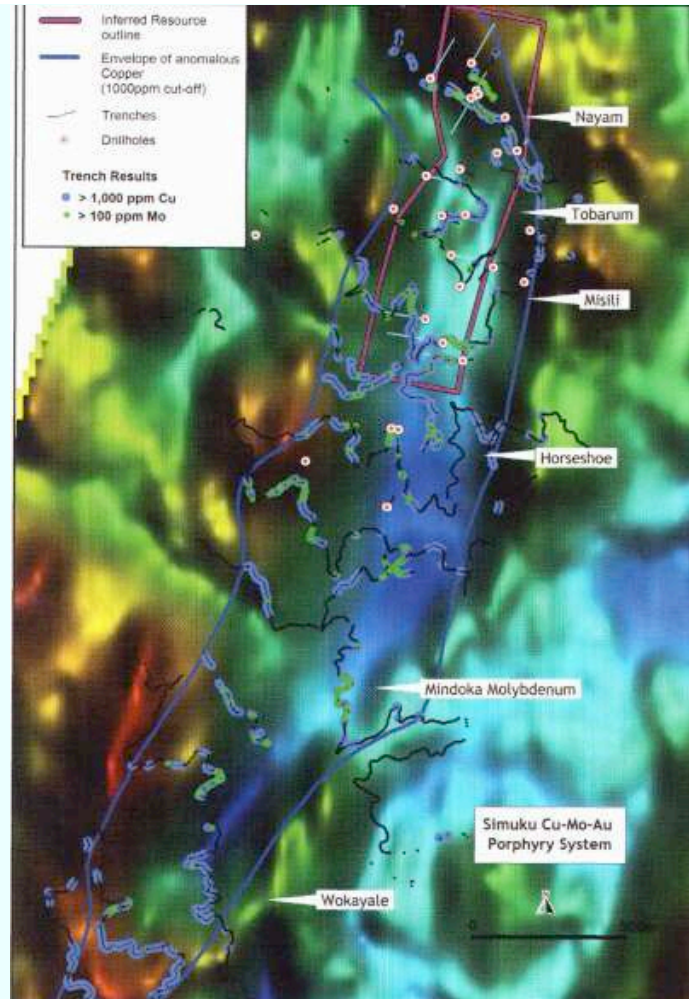
With the 2003 withdrawal of Chevron/Texaco, Australian companies have been the most active in developing PNG's mining and petroleum sectors, although ExxonMobil retains a major share of natural gas reserves and is constructing a liquefied natural gas processing facility, which it hopes to have operating in 2010.

InterOil, an American-owned company, operates an oil refinery in Port Moresby and is also looking at the feasibility of building an LNG processing facility by 2012 with production capacity of 32,500 barrels per day.

InterOil's drilling program at its Antelope Reef project has demonstrated very good reservoir quality through wireline logs and third-party evaluation, with chief executive officer Phil Mulacek describing results from Antelope 2 in November as "surpassing our expectations".

He said the logs of Antelope 2 were as good or better than those observed at Antelope 1.

InterOil has 4.6 million acres of petroleum licences in PNG.



Coppermoly's copper molybdenum-gold porphyry system at Simuku

Australian explorer New Guinea Energy has six onshore licences totalling 13 million acres adjacent to licences where 15 trillion cubic feet of gas has been discovered. The company plans to drill two wells this year and conduct seismic programs over two petroleum prospecting licences in PNG.

In addition, the country's

industrial minerals, such as limestone are drawing increasing interest, with a number of Chinese and Japanese companies evaluating the potential for cement production.

Some minerals information provided by Magnus Ericsson of the Raw Materials Group, Sweden, and the Mining Journal, UK.

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Antelope 2 leaps into record books

WHILE THE EXXONMOBIL-LED Papua New Guinea liquefied natural gas joint venture marches towards a late 2013-early 2014 timeframe for first cargoes, PNG's sole oil refiner and active explorer, InterOil, is stealing some of the limelight.

Just a few days after receiving Guinness World Book of Records certification for its Antelope 1 well in Gulf Province, which flowed 382 million cubic feet per day and yielded 5000 barrels of condensate back in March, InterOil set a new record with a massive flow at its Antelope 2 well on December 1.

Antelope 2 flowed 705MMcfd and yielded 11,200bbl condensate.

At that rate of condensate, InterOil president Bill Jasper said production could start in 24 months to generate "cash flow we never dreamed of".

The results are equivalent to about 129,000bbl of oil per day. InterOil is placing its own LNG plans for 2015 delivery on the backburner as it prioritises the liquids, with a potential oil zone further down at Antelope 2.

Using horizontal drilling, the company will look for oil in the well by the end of the year or in the first two weeks of January, with InterOil

chief executive Phil Mulacek saying he will do a cartwheel if it hits oil.

A feasibility study for a stripping facility for the kerosene-quality condensate has already begun.

InterOil is considering a final investment decision for the project in the first half of 2010, with the proposed 9000bpd facility to be located on the Purari River instead of the Elk-Antelope field.

The Elk structure and adjacent Antelope reef were calculated to hold 6.1 trillion cubic feet of gas and 100MMbbl of condensate before Antelope 2. – **Blair Price**