

Chinese help forge a

THE forging of a strategic alliance with HQ Mining and an evolving relationship with China National Automation Control System Corp (CACS) look set to bring Golden Cross Resources' Copper Hill Project in Central New South Wales into production.

Golden Cross' managing director Kim Stanton-Cook says the two Chinese-based companies will deliver the finance, technical assistance and equipment required to meet each stage of the development process at the copper and gold project.

The Australian company is backed by HQ Mining, which is the investment arm of the CUMIC Group of Companies in Australia. CUMIC is a privately-owned, Beijing-based investment company specializing in mineral and mining investment.

After reviewing Copper Hill data, CACS has become interested in the project and has indicated that it can bring about considerable savings in capital costs by fabricating or sourcing all necessary plant and equipment from China and assembling it, in modular form, on site. Access via the existing Copper Hill railway spur from the nearby town of Molong will be of great assistance to this proposal.

CACS is also prepared to complete a bankable feasibility study, acceptable to Chinese banks, at

a cost to Golden Cross of \$5.8 million while it has also indicated interest in a copper offtake agreement.

CACS, which is headquartered in Beijing, is a member of the China National Machinery & Equipment Corp Group and is a leading company focused on electromechanical technology, industry and trade.

Copper Hill is Golden Cross' most advanced project, with in-ground resources containing more than 421,000 tonnes of copper, 1.2 million ounces of gold and 3.3 million tonnes of sulphur.

Maximizing return from the existing resource is possible if all sulphides can be floated, roasted and converted into acid soluble copper and free gold within an iron oxide-rich roaster calcine.

Cathode copper can be produced by solvent extraction from the calcine followed by electro-winning (SX-EW) with the gold leached by cyanide, recovered by carbon-in-leach (CIL) and smelted to gold bullion.

Roaster exhaust sulphur dioxide will be captured to produce sulphuric acid for copper leaching with the excess available for sale. The residual iron oxide calcine should find a ready market in the steel making industry.

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Drilling at the Copper Hill site.



正在按照生产前的轨迹进行

GCR公司董事总经理 Kim-Stanton-Cook 说“GCR 正从事着具有很大挑战但最后会得到回报的一项事业。”

我相信，有HQ不断的支持以及CACS的利益关系，“铜山”发展进程的各个阶段所需要的资金、技术支持以及设备都会得到满足。

GCR是一家寻找多种矿产品的全球勘探公司，它和HQ矿业资源公司建立了一种战略关系。HQ将向GCR提供资金和开采加工设备的支持，这些设备将从中国引进。

在HQ的支持下，GCR将寻求新的勘探和发展机会，目标主要集中的澳大利亚、美洲、南非的铜和金项目上。

HQ公司和CUMIC公司享有共同的股东，是CUMIC集团在澳大利亚的投资工具。

CUMIC是一家总部设在北京的私人投资公司，专门从事矿产和矿业投资。

CUMIC在世界多个地方拥有勘探和开采资产的投资，主要集中在铁、铜及金。

来自中国国家自动化控制系统公司(CACS)的工作人员已经到现场考察了“铜山”，并参观了

位于南澳的可能建立烘烤炉，SX-EW和CIL车间的场地

CACS依据中国的银行可接受的标准，预测了一个需要花费580万澳元的银行担保可行性研究。CACS有能力确保“铜山”的生产“铜山”项目仍然是GCR公司的首要项目。该项目含有421,000吨铜，120万盎司金以及330万吨硫磺，无论对于GCR，中央西部社区还是新南威尔士州来说，它都是一个有价值的资源。

如果所有的硫化物都能在富氧铁的焙烧烘烤炉中经浮选，烘烤，并且转换成可溶于酸的铜及自由金，那么从现有资源中获得最大的回报是可能的。通过溶解萃取法，可以从附着电脱物的焙烧品生产负极铜(SX-EW)，然后用碳浸法(CIL)进行回收。同时经硫化物过滤后的金，经过熔炼可以得到金块。烘烤所消耗的二氧化硫可以转化为过滤铜所需要的硫酸而进行销售。残存的氧化铁焙烧物可以在炼钢行业找到一个稳定的市场。

在对“铜山”项目进行全面的调查的基础上，AMDAD公司完成了利用GCR公司提供的花费资金数据进行矿坑优化的任务。并作出了一个贴现现金流(DCF)评估，“铜山”将是一个

总产33.5万吨铜金属，超过110万盎司金块以及300万吨硫磺，开采年限约20年，总利润3.6亿澳元的矿山。这个优选模型所利用的基本参数是：铜、金、硫的回收率85%，铜的现价US\$2.70/lb,金的现价\$US800/oz,硫磺的现价US\$30/吨,美元对澳元的汇率\$US:\$A 0.85,折现率为10%。AMDAD所用的消费/价格设想和消减的4X指数允许在现存的以0.2%为铜的边界品位位的资源范围内用更低的边界品位(铜0.15%,金0.3g/t)来定义另外的矿化体。“铜山”场地的开发费用大约为3.1亿美元，这是一个用传统的破碎-研磨-浮选技术开采的露天矿，年产矿石800万吨。

另外评估建造硫化物烘烤炉，用SX-EW技术回收铜金属以及CIL方法和氰化物技术回收金块的硫酸回收车间的费用为1.1亿美元。用这种方法大概可以回收20年，每年约1.7万吨铜，5.5万盎司金以及超过45万吨的硫酸。

CACS工作人员经过在澳大利亚以及对中国“铜山”生产设备进行调查后指出，从中国制造引进必需的生产设备并按照标准组件的方式在现场安装，可以大大节省现金开销。现存的从Molong镇通经“铜山”的铁路会提供很

production road at Copper Hill

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On this basis a review of the Copper Hill optimized pits has been undertaken by Australian Mine Design & Development indicating a way forward for the project which delivers an estimated discounted cash flow for an operating mine of \$360 million, a mine life of almost 20 years producing 335,000 tonnes of copper metal, more than 1.1 million ounces of gold bullion and 3 million tonnes of sulphur.

Development costs at the Copper Hill site of about \$310 million are now estimated based on an open pit mine with conventional crush-grind-float technology and annual ore throughput of 8 million tonnes.

An additional \$110 million is estimated to build a sulphide roaster, sulphuric acid recovery plant with copper metal recovery using SX-EW technology and gold bullion following cyanidation and CIL. This approach would recover annually, on average, about 17,000 tonnes of copper, 55,000 ounces of gold and more than 450,000 tonnes of sulphuric acid for almost 20 years. This is likely to be built in South Australia.

The total Copper Hill resource is 133 million tonnes @ 0.318% copper and 0.283 grams/tonne gold. Measured resources make up 13% of the total, indicated 50% and inferred 37%.

The project requires current metal prices to be sustained in the long term. The capital cost esti-

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mates for process plant and infrastructure for an 8 million tonne operation have to be achieved or bettered and CACS has the ability to make substantial savings. For the roaster, joint ventures with other sulphide suppliers will be considered in sharing construction and operating costs. Acid sales will be critical to the project's success.

Kim Stanton-Cook says there are environmentally positive aspects of the proposed process. "Flotation of all sulphides to feed the roaster brings cleaner tailings. The roasting process is autogenous and self-sustaining using the sulphides as fuel. The sulphur dioxide exhaust, essential for acid production, will be captured to the maximum extent possible. The roasting process generates considerable heat which may be used for power generation as is done at Olympic Dam. Carbon credits should be obtainable."

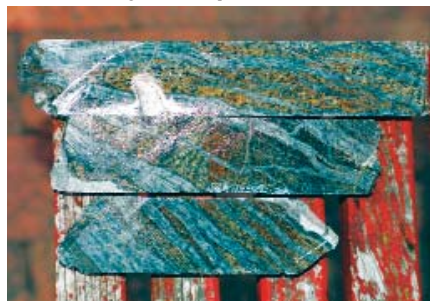
Copper Hill is well placed in regard to infrastructure. It is 5km north of Molong (population 1600) and the towns of Orange (40,000) and Wellington (10,000) lie 40km south-east and 60km north respectively. Major mines such as Cadia-Ridgeway and Northparkes operate in the region and local maintenance facilities and supply chains are well established.

The Mitchell Highway is adjacent to Copper Hill; the former Molong to Dubbo railway line, which is suitable for in-bound construction materials and outbound concentrate trucks, terminates beside the site; and a 132kv power sub-station is only 4.5km from the site.

In South Australia a meeting and regional tour with the Southern Flinders Ranges Development Board has demonstrated the benefits of Port Pirie as a potential site for the roaster-acid plant-SX-EW-CIL complex. Vacant land is available close to water, power, road and rail. Standard gauge rail links directly between Molong and Port Pirie.

Additionally, sulphuric acid consumption in South Australia is predicted to increase substantially with the expansion of Olympic Dam mine plant and the increasing number of in situ leaching uranium deposits coming on stream. Further acid sale potential exists with rare earth and phosphate treatment plants under consideration in South Australia.

While there is a clear path to production, Golden Cross has funding available for an expanded exploration effort and a 4000 metre drilling program, including deep drilling beyond 350 metres depth, has been planned beneath Copper Hill, at Buckleys Hill (Copper Hill North) and at the higher grade Wattle Hill Zone to the south. The Power, Vale Head and Hayshed prospects will also be drilled more extensively.



大帮助。中国的银行已经接受了CACS公司准备的银行可接受的可行性研究，GCR公司消费额为580万澳元。CACS公司也表示对铜矿销售备忘录有兴趣。

这个项目需要金属价格长期稳定在现在的水平才可行。对年产800万吨矿石量的处理车间和基础设施的现金消费评估是必须达到的，当然更多更好。CACS公司有能力在这个环节进行足够的节省。对于烘烤炉，将会考虑和其他硫化物厂商进行合资以节省建造和运作费用。硫磺的销售对项目的成功至关重要。

因为矿石的剥采率以及极好的冶金特性，使得矿床的浪费率很低。目前的冶金测试表明，通过焙磨，铜和金的回收率将超过85%。浓缩物很干净，没有有害元素，处在一个很高的水平。“铜山”的含矿岩石具有很低的地表剥离指数，运送到破碎车间的时间短，可以节省很多电量。

从提出的处理方案中可以看到一些有利于环境方面的因素。供应烘烤炉的所有硫化物的浮选工作可以带来有利于环境的清洁尾矿物。烘烤处理是利用硫化物作为燃料的自生及

自维持过程。消耗的二氧化硫实质上可以生成硫酸，将尽可能的被提取出来。烘烤过程产生的大量的热量可以用于发电，Olympic Dam及其他地方就是这样做的。碳的排放应该可以得到信任。

该项目得到了Cabonne郡委员会及当地居民的支持。该地区在建筑和加工方面有很大的容量。当地的主要矿山有Cadia-Ridgeway和Northparkes并且已经建立了维护实施及供给链条。

其他主要的基础设施还有：

- 靠近矿区的Mitchell高速公路；
- 以前的Orange-Dubbo铁路线，适合于国内建筑材料和国外集装箱的运送，终点站位于“铜山”边上。
- 一个132KV的变电站位于Molong镇东边郊

区，距离“铜山”4.5公里。

同Pirie港口的Southern Flinders Ranges发展委员会在南澳举行的一次前期会议和地区调查表明，将Pirie港口作为将来烘烤加工（硫酸车间-SX-EW-CIL混合物）的场地是有利的。这块空地靠近Pirie港口区域内的水、电、公路及铁路。该区域有技术熟练的劳动力，同时Southern Flinders Ranges发展委员会表示，如果项目得到进一步的推进，他们会给与大力的支持。连接Molong与Pirie港口的铁路线按标准规范来执行。另外，据预测，随着Olympic Dam矿山和车间的扩大，在南澳地区的硫酸消耗将会大大增加。更多的硫酸消费潜力存在于全球以及南澳政府正在考虑的磷酸盐处理厂计划。

现在需要融资来支持进一步的勘探，4000米的勘探计划，包括在“铜山”下面，Buckleys Hill（“铜山”北边）以及具有更高品位的Wattle Hill（“铜山”北边），深度超过350米的深部勘探。在Power, Vale Head以及Hayshed勘探区同样需要更进一步的勘探工作。