



# GOLDEN CROSS RESOURCES LTD

ABN 65 063 075 178

## ASX / Media Release 5 March 2010

### ABOUT GOLDEN CROSS RESOURCES LTD

GCR is a multi-commodity global explorer, which has formed a strategic alliance with CUMIC subsidiary HQ Mining Resources providing access to capital and mining and processing equipment from China.

GCR is continuing to progress its 100%-owned copper-gold Copper Hill Project and is accelerating its exploration programs with drilling completed at Burra, Rast in NSW and Mulga Tank in WA. Further drilling is planned at Cargo in NSW. Large prospective areas are under application for gold and base metals in South Australia and Panama and coal in Queensland. GCR holds substantial phosphate resources in Queensland.

GCR, backed by CUMIC, is seeking new mineral exploration and development opportunities focusing on copper and gold in Australia, the Americas and southern Africa.

### ABOUT China United Mining Investment Corporation (CUMIC)

CUMIC is a privately owned, Beijing-based investment company specialising in mineral and mining investment.

CUMIC has a portfolio of exploration and mining assets in various parts of the world, focusing on iron, copper and gold.

CUMIC developed and controls the Mongolia Eleet River Iron and Steel Company, a major iron ore mining company, and is currently seeking an IPO on the Hong Kong Stock Exchange



## COPPER HILL

### Highlights

- \$360 million NPV at 10% discount, calculation using US\$2.70/pound copper and US\$800/oz for gold repaying 420 metre Capex. See table, page 5.
- New Assays: Hole 297, 21 metres @ 0.5% copper from 102 metres and 13 metres @ 0.28g/t gold from 120 metres.
- Sulphide Roaster – SX-EW – CIL option supported
- Four commodities to be produced Copper – Gold – Sulphur – Iron: thereby maximizing value
- Metallurgical: recoveries 75% recovery to cathode copper gold recovery 2 bullion is 75% 92-93% to sulphur acid. Conventional technologies to be used.

### COPPER HILL – ASSAY RESULTS

GCR is currently drilling to upgrade resources by exploration of peripheral zones at its Copper Hill copper-gold project.

Results for the first hole in the program have been received:-

**GCHR 297: 21metres @ 0.51% copper,  
0.18 gpt gold from 102 metres**

Hole 297, 21 metres and assaying 0.5 copper and 13 metres assaying 0.28g/t gold which extends to the known mineralised zone, with an adjoining gold zone immediately below with 13 metres @ 0.30 ppm gold from 120 metres.

GCHR 297 was sited to provide grade information at the north-western extremities of Copper Hill where the current block model is sparse or fragmented and to provide a geochemical vector for sitting a future deeper hole. GCHR 297 was also sited to test extensions to the intercept in GCHR 192 [40 metres @ 0.3% copper, located 50metres to south] using the optimal, west-drilling azimuth.

GCHR 297 and 298 are 300 metres and 150 metre step-outs respectively along strike northwest from section 6000N where previous deeper holes returned 106 metres @ 0.31% copper, 0.12ppm Au from 116 metres down-hole and 70 metres @ 0.32% copper from 12 metres down-hole. [In the current program GCHR 302, drilled 110 metres down dip from GCHR 266 has intersected a zone of altered and strongly stock-worked volcanics with high sulphide, mainly pyrite, content. Assays are pending]



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Seven holes totalling 1519 metres have been completed to date in the current 4000 metre drill program. Assays for the remaining holes will be reported as they come to hand.

## **COPPER HILL – METALLURGICAL TESTWORK UPDATE**

*All processing steps set out below describe conventional technologies currently in use around the world. Shareholders are encouraged to read the following, and seek advice if needed. It is important to appreciate that the metallurgical test works underway, hopefully leading to an optimum process result, are well-advanced and encouraging.*

***Ken Kellett, Metallurgical Consultant***

### ***Background***

Prior metallurgical test-work on Copper Hill ore had focused on production of a copper–gold flotation concentrate. Whilst copper recoveries were acceptable, much of the gold-bearing pyrite required additional processing. An alternative approach of maximising the recovery of copper, gold, sulphur and iron by sulphide roasting subsequently emerged.

An observation from the early Copper Hill metallurgical work was that over 90% of the metal sulphides could be easily recovered to a bulk sulphide concentrate. A desktop analysis of a more comprehensive processing flow-sheet, based on this observation and associated data, highlighted the potential for superior returns from more comprehensive processing and recovery of the copper and gold as metals.

This flow-sheet is the subject of the current test program. It is based on roasting of the bulk concentrate with production and sale of co-product sulphuric acid, followed by leaching of copper and gold from the roasted concentrates, or calcine. Copper recovery would be by solvent extraction and electro-winning technology, and gold extraction by cyanide leach. All processing steps are conventional technologies, as outlined in the GCR ASX/Media release dated 4 November 2009.

This comprehensive option owes its economic attractiveness to the higher net metal recovery potential than the simpler copper–gold flotation concentrate flow-sheet. However, a review of the early test-work data highlights the potential for significantly improved recoveries to marketable concentrate, and so remains as a potentially viable alternative to be examined in the forthcoming Feasibility Study.

A substantial proportion of the composited ore sample from the earlier test-work has been kept under airtight storage at Metcon Laboratories, Brookvale NSW, where both the prior and current test-work is being conducted.

### ***Flow-sheet Development***

Each step in the extraction process exhibits its own characteristic process efficiency and all steps taken together can be likened to links in a chain. The first link in the extraction process chain is flotation. Any values not recovered from the ore in this step are permanently lost to tailings. For this reason most of the test-work effort to date has been directed at maximising value recovery from this unit operation.

### ***Comminution and Flotation***

Ore crushing and milling is modelled on the comminution data from earlier test-work. A conventional SAG mill – Ball Mill combination has been selected. No further comminution testing is being done in this

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current program due to lack of suitable core samples. The current core drilling program at Copper Hill is designed to produce additional metallurgical test material.

The flotation process for recovery of a bulk sulphide concentrate is based on a P80 grind size between 106 and 150 $\mu$  (microns), with the finer size offering marginally better overall recovery.

The ore responds well, with 80% of the copper, 70% of the gold and 90% of the sulphur reporting to a direct rougher concentrate of quality suitable for autogenous roasting (i.e. self-sustaining without external heat input). This concentrate is dewatered to a high pulp density in a gravity thickener and transferred directly to the roasting plant.

The targeted concentrate grade is 26-27% sulphur. Based on preliminary slurry rheology this concentrate grade is suited to slurry feeding, the lowest cost and simplest embodiment of sulphide roasting technology.

The rougher tail then passes through a scavenging circuit where another 10+% of the copper, 10+% of the gold and 6% of the sulphur are recovered to a low grade concentrate. This concentrate is cleaned to the required extent in a small satellite cleaning circuit after regrinding to 53 $\mu$  in a ball mill (small in size because of the low mass flow in the stream). Recovery to concentrate from this step is approximately 80% for overall recoveries of 88% for copper, 82% for gold and 95% for sulphur.

The cleaner tail is recycled to the head of the flotation circuit where some further value recovery is normally expected, but this remains to be confirmed and is the subject of imminent test-work.

A variety of flotation reagent schemes have been tested and several exhibit similar recovery and selectivity, indicating robust flotation chemistry.

### ***Downstream Processing***

Sample size limitations have constrained the amount of possible downstream flow-sheet test-work. The main unit operation of interest here is the metallurgical response to concentrate roasting, i.e. the recovery of values from the roaster calcine.

In commercial operations a fluidised bed roaster would normally be employed, but testing the process in a mini-pilot plant requires an order of magnitude more concentrate sample than can be produced from the presently available sample.

To obtain a "sighter" on said metallurgical response a small static furnace is typically used. In these types of apparatus, particle residence time history is different and typically longer than would be the case for a fluidised bed under similar stoichiometric conditions. For gold, little or no effect is observed on Copper Hill-style 'clean' pyrite feeds. Copper however is prone to form ferrites in some measure which "hide" copper values from the subsequent acid leach solution. At normal 650-690°C pyrite roasting temperatures for this ore type, the ferrite reaction exhibits comparatively slow kinetics, but it may still reduce copper leach recovery by a few percentage points.

Consequently copper extraction from a true fluidised bed roaster calcine is expected to be higher than from a static bed. From the 680°C test calcine, acid leach at pH=1.0 resulted in 90% copper extraction to Pregnant Liquor Solution (PLS). The subsequent pH adjustment and cyanide leach resulted in 90% gold extraction.

For the chalcopyrite copper mineralogy of this deposit, experience with other commercial (and continuous mini-pilot) copper ore roasting installations indicates copper leach extraction efficiency in the range 93-95% to be a realistic expectation.

Test-work for copper recovery has yet to be conducted on the PLS. As the ore is comparatively clean of deleterious elements like arsenic, antimony and other base metals, good recoveries are expected. Typical solvent extraction – electro-winning efficiencies are 95% of the PLS values.

### ***Roaster and Acid Plant***

A suitably qualified process technology provider should be able to design and supply a roaster and acid plant, incorporating energy recovery as required, without reference to testing. This situation is reflective of

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the maturity of the technology. Roasting test-work however is required to define process metallurgy, i.e. copper solubility in acid leach and gold recovery in cyanide leach.

A similar situation exists with solvent extraction and electro-winning (SX-EW). Sample requirements for roasting will result in the generation of sufficient calcine, and thus PLS, for risk mitigating SX-EW confirmatory test-work.

Double contact – double adsorption sulphuric acid plants are typically designed to produce 96-98% acid at a sulphur dioxide to acid conversion efficiency of 99.8%. Overall sulphur losses from calcine retention and gas cleaning operations are typically about 2%.

### **Iron Recovery**

Calcine is essentially a low purity iron oxide, mainly hematite. The hematite associated iron tenor is approximately 28%, which would not normally be considered for processing in an iron ore operation, however this iron fraction has an advantage over comparable ore in that it is already mined, transported, milled and in slurry suspension.

Based on other iron ore flotation flowsheets (for upgrading taconite, itabirite and magnetite) and the low potential penalty element content of the Copper Hill ore, desktop economic analysis indicates iron recovery to be economically viable at present fines market prices. The key lies in the percentage recovery to >90% hematite product, which is as yet untested.

### **Overall Recoveries**

Overall copper recovery, ore to cathode, is indicated from this test-work to be 75%. Corresponding gold recovery to bullion is 71% and for sulphur to acid, 92-93%.

### **Forward Program**

The metallurgical test program has demonstrated good recovery of sulphides to concentrates, particularly for an ore of this grade. Only very preliminary roasting test-work has been done, which with its limitations, has indicated the concentrate is amenable to treatment by this process route. Insufficient calcine sample has been generated to test iron recovery.

The next phase of the test program about to commence will reconfirm the overall flotation circuit recovery and generate a concentrate sample for further roasting tests with sufficient cyanide leach tail for some preliminary iron ore recovery tests.

That work is scheduled for completion by the end of March. The current core drilling program will produce concentrate samples of sufficient size for continuous roasting tests and further definitive downstream metallurgical test-work.

*Ken Kellett (MAUSIMM, AMIChemE, TMS) is a chemical engineer with 40 years experience in the chemical, wastewater and, since 1978, the extractive minerals industries. He joined Dorr-Oliver Pty Ltd in 1980.*

*As Technical Director he oversaw the gamut of Dorr-Oliver's liquid-solid separations technologies. As a member of, and later Manager of the Thermal Processes Group, Ken was responsible for the marketing, testing, process engineering, commissioning and periodic field services activities with a number of fluidised bed projects, mainly in sulphide roasting.*

*In 1999 he commenced work as a consultant - contractor on fluid bed test programs in the USA and Germany before returning to Australia to join AMMTEC Limited in 2000. At AMMTEC he worked on corporate development activities, pyro-metallurgical and hydro-metallurgical test programs, membrane based separations (NF/RO) and ion exchange systems. In late 2008 he returned to consulting, and continues to consult on fluidised bed ore roasting projects.*

*Ken consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.*

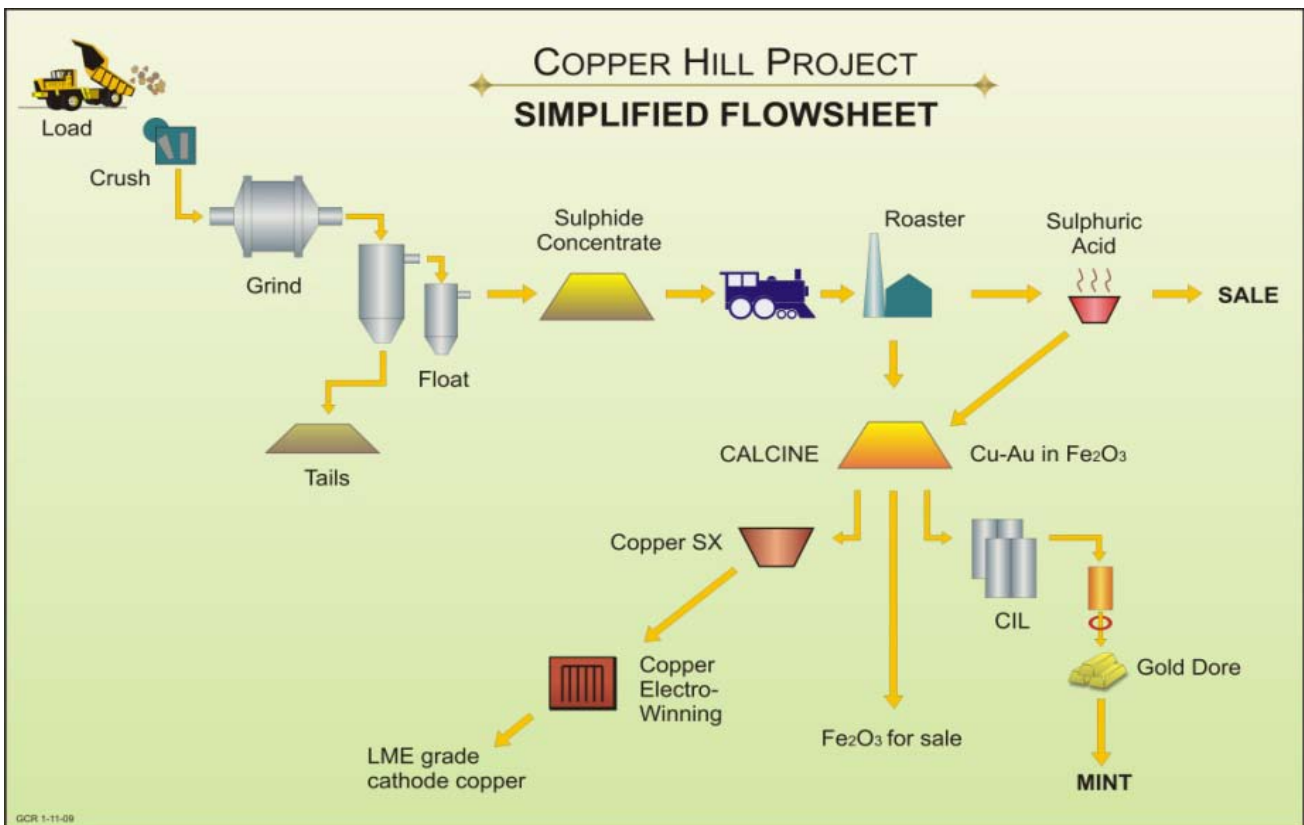


**Copper Hill Calcine Sample**

**AMDAD's late-2009 Pit Optimisation Parameters**

	Case 1	Case 2	Case 3
Gold price US\$/oz	600.00	800.00	1000.00
Copper price US\$/lb	1.90	2.70	3.50
DCF (10%) for 8Mtpa ore throughput. Capital of \$420 million deducted	A\$115 million	A\$360 million	A\$542 million
Mill feed, million tonnes @ 8Mtpa (diluted) for mine life (years)	108 for 14	156 for 20	167Mt over 20.9 years

**Copper Hill Schematic**



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## CORPORATE DIRECTORY

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### Board of Directors

Chris Torrey Chairman  
Kim Stanton-Cook Managing Director  
Xiaoming Li Non- Executive Director  
Hui Xiao Director Business Development  
Xun Qiu Non Executive Director  
David Timms Non Executive Director  
Daven Timms Alternate Director for Mr Timms

### Issued Share Capital

Golden Cross Resources Ltd has 907.5 million ordinary shares on issue.

### Company Secretary

Simon Lennon

### Share Registry

Registries Limited  
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Sydney NSW 2000

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*Please direct shareholding enquiries to the Share Registry.*

*The information in this report that relates to Exploration Results is based on information compiled by Kim Stanton-Cook, who is a member of the Australian Institute of Geoscientists, is a full-time employee of GCR, and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Kim consents to the inclusion in the report of the matters based on this information in the form and context in which it appears.*

