

DEVELOPMENT OF A GLYCINE-CYANIDE LEACH PROCESS FOR GOLD-COPPER CONCENTRATE

By

¹Brigitte Seaman, ²Tim Newton and ³Elsayed Oraby

¹Newcrest Mining Limited, Australia

²Mining and Process Solutions, Australia

³Curtin University, Australia

Presenter and Corresponding Author

Brigitte Seaman

ABSTRACT

The GlyCat™ process offers a simple and effective method to reduce cyanide consumption caused by the presence of copper in gold ores and concentrates. Reusable glycine is added to the leach to enable a 5-fold reduction in cyanide usage, while eliminating detox requirements. Copper is recovered by either sulphide precipitation or resin ion exchange. Gold is recovered by conventional carbon adsorption or alternatively using gold-selective resins.

The process is being developed for implementation at Telfer Gold Mine to facilitate a change in circuit design that would then allow for increased concentrations of soluble copper to be tolerated in an expanded gold cyanidation circuit. This paper examines why GlyCat™ is preferred over alternative processes, and describes the process development activities conducted over the past 2 – 3 years.

An extensive program of batch testwork has defined the optimum leaching chemistry and proved the effectiveness of downstream processes. Three continuous piloting campaigns have shown that the process is robust and controllable, while verifying the reagent consumptions and gold recovery under steady-state conditions. Bench-scale testwork, Process modelling, and engineering studies have narrowed down the circuit configurations to a preferred flowsheet, involving single stage leaching and conventional downstream recovery.

Implementation at Telfer will require extra leach tanks, solid liquid separation equipment on the leach feed and discharge, and a copper recovery section. Glycine consumption is anticipated to be less than 3 kg/t concentrate, while the resulting saving in cyanide is at least 30 kg/t if the same concentrate were treated using cyanidation leaching alone.

Keywords: Gold Recovery, Copper Recovery, GlyCat™, Process Development, Pilot Plant