Flowsheet Development of A Refractory Gold Ore To Minimise Arsenic Issues In The Environment

Damian Connelly¹

1.Damian Connelly FAusIMM(CP)

Consultant Principal Engineer, METS Engineering Group, Perth WA 6005. Email: damian.connelly@metsengineering.com

FLOWSHEET DEVELOPMENT OF A REFRACTORY GOLD ORE TO MINIMISE ARSENIC ISSUES IN THE ENVIRONMENT

Following the discovery of a major gold resource, discussions with the regulator introduced restrictions on how the ore could be processed. The regulatory requirements necessitated that no arsenic was allowed to migrate into the environment. In addition, iron arsenate was not considered sufficiently stable to exist within the environment, and it was mandated that arsenopyrite, which contained the gold, could not be chemically changed.

Testwork was undertaken to develop a flowsheet that would maximise gold recovery from an ore containing 3 g/t Au and high levels of arsenic.

Treatment of the sulphide ore involves gravity separation, flotation, and cyanide leaching. A gravity concentrate is recovered within the grinding circuit before the ore is subjected to froth flotation. The concentrate from the flotation circuit is then treated to produce an arsenopyrite-rich bulk concentrate. The bulk concentrate is then subjected to ultrafine grinding, ahead of cyanide leaching.

This paper follows the development path and lessons learned through this case study, particularly in maximising recovery over time.