

Newmont Goldcorp Boddington Concentrate Grade Improvement Project

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ABSTRACT

Newmont Goldcorp Boddington's ore may be described as a gold ore with a copper problem. The bulk of the revenue is derived from sales of gold contained in either a gold bearing copper concentrate or doré bars. The copper head grade is below what would typically be considered economic for a copper sulphide flotation circuit. Despite this low copper head grade a sulphide flotation circuit is required. Without a sulphide flotation circuit the leach circuit cyanide consumption/destruction cost would be excessive and the gold recovery would be reduced as a proportion of the gold is associated with the sulphide minerals. Producing a marketable gold bearing copper concentrate from copper head grades as low as 0.06% Cu has necessitated a cleaner circuit which includes concentrate regrinding and up to three stages of cleaner flotation.

The levels of non-sulphide gangue in the copper concentrate would often exceed the level at which penalties would apply to concentrate sales. The concentrate grade improvement project investigated a number of alternative methodologies to reduce the non-sulphide gangue entrainment to eliminate these penalties. The project outcome was the installation of a cavitation tube flotation column with froth washing. The cavitation tube flotation column was installed in a cleaner scalper flotation duty with a number of alternative circuit configurations either retained or modified to maintain the flexibility of the cleaning circuit to treat a wide range of copper head grades. In addition to reducing penalties, reducing non-sulphide gangue entrainment also reduced transportation and treatment costs through the lower concentrate mass produced. This paper will outline the concentrate grade improvement project from identification through to benefits. The paper will also outline some novel design features that further improve the operability and maintainability of cavitation tube flotation columns with froth washing.