



White Paper

The Current Status of Hydraulic Backfill Techniques in South Africa

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The gold mining operation in South Africa produces a mixture of gold-bearing ore and broken waste rock which, after a primary separation of the barren waste is hauled to the surface. The end products of the mining operation are gold and two types of waste material, a broken rock and a silt sized rock flour. Up to the present a small proportion of the waste rock has been disposed of by hand packing into the stopes. The remaining waste rock is normally disposed of by mechanical tipping, while the slimes are pumped to form hydraulic fill slimes dams.

As the mining progresses in the direction of the reef, the deep (1,5CX>-3,500 m) stope excavations close or converge under the tremendous rock overburden pressures of up to 100 MPa at a depth of 3,5CX> m. Conventionally the closure movement has been controlled by means of timber-concrete grillage supports on mat packs which are progressively compressed as the stope closes. The use of timber has several disadvantages:

- The handling of the timber is labour intensive and occupies valuable shaft time.
- The timber constitutes a fire hazard and ventilation is difficult to control because of the large open spaces between the packs.

As an alternative the hydraulic filling of slopes in deep mines with pumped tailings is an attractive proposition as a means of controlling the convergence of the stopes, absorbing energy released from the surrounding rock and increasing the percentage extraction of gold from wide reefs.