

RISK ASSESSMENT OF RESERVE CALCULATION DURING MILESTONES OF A MINE LIFE.

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The Graça orebody is part of the sulphide copper deposit of Neves Corvo Mine in Portugal. This orebody is virtually totally mined out at this stage and consequently has a great deal of data allowing sampled ore grades to be reconciled with actual ore reserves and grades. From the start of exploration and throughout the mining, important economical and technical decisions have been based on models of average grade values and uncertainty associated with the sampling results. The decision to commence mining operations in the orebody was based on sampling information obtained from surface bore-holes and the optimum area for initiating mining was based on underground boreholes. A dense grid of chip samples taken from the faces of development ends was used to determine that Drift and Fill was the most appropriate mining method for this orebody. These three different sets of sampling data allow us to know three different “realities” of the same orebody at different times. The objective of this paper is to apply the stochastic simulation techniques to evaluate the uncertainty involved in each step. The role of each component of spatial uncertainty given by the simulation models- lack of knowledge about the physical phenomenon and intrinsic variability of the orebody variables- in those decisions, is evaluated by comparison with the known reality. For example, in a given decision step it is analysed which part of uncertainty came from the stationary assumptions, spatial covariances models, etc., and which part came from the natural heterogeneity of the orebody. Two main simulation models – sequential simulation and probability field simulation- are discussed and the performance and appropriateness for each decision step, is analysed.