

# Value of information: Blast hole assay tool spacing analysis using geostatistical simulations

*Jayant Ashford<sup>1</sup>, Ilnur Minniakhmetov<sup>2</sup>*

1. Geologist STGM, Short Term Geological Modelling, BHP, Perth WA 6000. Email: jayant.g.ashford@bhp.com
2. Principal Geoscientist Data & Numeric Modelling, Resource Centre of Excellence, BHP, Perth WA 6000. Email: ilnur.minniakhmetov@bhp.com

Keywords: value of information, uncertainty quantification, conditional simulation, geostatistics

## ABSTRACT

Resource characterisation is critical for informed decisions in both strategic and operational space. The sources of information for resource characterisation are limited by: direct measurement of resource attributes, such as grades, rock-types, mineralogy, etc, is available only from sparse locations, i.e. drill-holes; or indirect geophysical measurements such as seismic, gravity, electro-magnetic survey, etc. Data collection tools, methods, and processing technologies are constantly improving providing a broad spectrum of options for data collection strategies. The cost of each data survey varies from thousand to millions of dollars with the value of each additional data having diminishing return for a particular business decision. The value of information analysis provides the optimal decision on data collection strategy within a limited available budget. This work presents an example of value of information analysis for new blast hole assay tool (BHAT) and reverse circulation grade control (RCGC) data used in addition to the wider spaced tactical infill sampling data acquired prior to grade control. The value of information is quantified in terms of reduction of ore loss and dilution by comparing different combinations of data collection methods. First, four different strategies were considered: tactical infill samples in addition to 50% of blast holes surveyed with BHAT, tactical infill samples in addition to 33% of blast holes surveyed with BHAT, tactical infill with wide-spaced RCGC data, and tactical infill without additional grade control. For each strategy the observed values have been simulated using advanced multivariate geostatistical simulations and compared with the simulated ground truth model. The calculated ore loss and dilution informed the optimal data collection strategy.