

Unlocking coal resource uncertainty using simulations

R Saha¹, B Haase²

1. Superintendent Geological Modelling, BHP, Brisbane, QLD 4000. Email:ranjan.saha@bhp.com
2. Specialist Operation Performance Insights, BHP, Brisbane, QLD 4000.
Email:ben.haase@bhp.com

Keywords: SGS, Uncertainty,

ABSTRACT

Non-linear stochastic modelling has been used extensively in metals exploration to assess uncertainty of geo-metallurgical variables by building robust distributions around grade and tonnages estimates. Recent work at BHP Metallurgical Coal has brought this capability to coal. The existing paper outlines considerations specific to coal geology as well the post-processing required to enable its practical usage from production to strategic timeframes.

Conditional Simulations using SGS is used to determine the uncertainty and understand the resource confidence around specific variables with the assumption of spatial continuity across separate domains for each coal seams. The variation between each simulations for a given parameter reflects uncertainty due to geological conditions and data support.

With its aid, we aim to classify and quantify the existing two (2) and five (5) year plan resources into more detailed production sensitivity classifications based upon some critical variables (thickness, ash, sulphur, phosphorous etc) within their acceptable thresholds. The objective of this work is to de-risk the plan by optimizing infill data collection and improve stability in short term planning through increased understanding of resource confidence both locally and at global resource definition stages.

The paper also demonstrates the use of corresponding automated workflows and systems to minimise the time spent on the process, expediting the computations on virtual environments.