

AN APPLICATION OF CONDITIONAL SIMULATION TO THE PHOSPHATE HILL DEPOSIT, WMC RESOURCES

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Correctly characterising, predicting and managing grade variability is central to short and long term planning at the Phosphate Hill operation. The aim is to maximise P₂O₅ recovery while minimising the adverse impact on the chemical processes of such impurities as Al₂O₃ and Fe₂O₃.

A 2D conditional simulation of P₂O₅, Fe₂O₃ and Al₂O₃ grades was performed in an area of the deposit drilled on 5m centres. The objectives of the work were four-fold:

- to assess confidence intervals associated with grade prediction of parcels of ore.
- to obtain probability maps for a range of block sizes and cut-off grades.
- to compare the merits of ordinary kriging and conditional simulation for grade control purposes.
- to evaluate grade control strategies.

Conditional simulations models were developed for point support using the Turning Bands technique. The conditioning data were subsets of the original data on 10m and 20m centres in order to assist with appropriate grade control drill spacing.

The confidence intervals developed using the conditional simulation models were in line with those established using the classic estimation variance approach and more importantly with production experience.

The paper presents methodology and results.