

3D GIS APPLICATION IN THE OREBODY MODELLING AND RESOURCES ESTIMATION OF THE MANJIAZHAI SN-ZN DEPOSIT, CHINA

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The paper discusses the 3D GIS application in the spatial modelling and resources estimation of No.13 orebody in the Manjiazhai Sn-Zn deposit, Yunnan province, China. The packages used in the research are Candian Lynx and microlynx softwares. The results will provide the basis for the investment decision of mining the sn-zn deposit as well as in-filling exploration.

A drillhole database was first created based on 158 drillhole which intersected No.13 orebody at a 80 m × 60-80 m grid. Then, data analysis was carried out. Univariate statistical analysis indicates that the Sn value is consistent with a single log-normal distribution while the Zn value fits a multimode log-normal distribution. The three dimensional i.e. normal, relative, and log-normal semi-variograms of Sn and Zn have been computed and modelled. The resultant parameters of the log-normal semi-variogram have been used for grade estimation. A linked-slice model and a surface-based model have been selected to represent the No.13 orebody in 3D space. The corresponding block model and grid model were then chosen for the resource estimation. The selected grid cell dimensions are 25m × 20m × 15m in the block model and 25m × 20m in the grid model respectively. Kriging was applied in the interpolation of grade values of Sn and Zn.

Based on cut-off grades of 0.2% Sn and 3% Zn, the estimated minable resource is 21.6 Mt with average grades of 0.77% Sn and 4.08% Zn by the block model and 18.3 Mt with average grades of 0.90% Sn and 4.58% Zn by the grid model respectively.