عنوان مقاله:

An Integrated Geo-Statistical Methodology for an Optimum Resource Estimation of Angouran Underground Mine

محل انتشار:

تعداد صفحات اصل مقاله: 17

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خلاصه مقاله:

Resource estimation and determining the grade distribution is one of the most important stages in planning and designing the open-pit and underground mines. In this work, a new mythology is used for resource estimation of the Angouran underground mine based on the optimized integration of the indicator kriging (IK), simple kriging (SK), and inverse distance weighted (IDW) methods. For this purpose, waste blocks are first removed from the block model using the IK method. Then the amount of mineral resource is estimated using the SK and IDW methods. Indeed, variograms are developed to estimate the grade of zinc minerals in the three used methods. Variograms analysis in three directions prove that the studied resource is anisotropic. Also the validation results confirm that the correlation coefficients between the measured and estimated zinc values by the SK and IDW methods equal to ۰.۷۶ and ۰.۷۵, respectively. Knowing this satisfactory result, a ۳D model of the resource is prepared using the IK method, in which the ore and waste sections of the Angouran underground mine are separated definitely. According to the above methodology, the calculated resource of the Angouran underground mine using the SK method is achieved ۱۳۷۳۹۶۲.۵ tons with an average grade of ۳۰.۱۱%, whereas the estimated amount of this resource is attained ۱۳۴۹۳۲۵ tons with an average grade of ۳۱.۸۸% using the IDW approach. The verification results show that the suggested methodology based on the optimized integration of the IK, SK, and IDW methods can be successfully applied for resource modeling and grade estimating of the Angouran underground mine.

کلمات کلیدی:

Angouran underground mine, Resource Estimation, Indicator kriging, Simple Kriging, Inverse distance weighted

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