THE SPATIAL DISTRIBUTIONS OF PYRITE CONCRETION AND ITS INFLUENCE IN CONTINOUS COAL MINING SYSTEMS

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The Spatial Distributions of Pyrite Concretion and its Influence in Continous Coal Mining SystemsCOSTA, JOAO FELIPE 1, KOPPE, JAIR CARLOS 1 AND DIMITRAKOPOULOS, ROUSSOS 2 1 Mining Engeering Depatment, Federal University of Rio Grande do Sul, Porto Alegre, Brazil; 2. W.H. Bryan Mining Geology Research Centre, The University of Queensland, Brisbane, AustraliaMine planning in the coal industry is traditionally developed using a geological model built by discretising relevant geological attributes into small blocks. Production scheduling is planned based on a 3D geological model representing important features, such as coal seam thickness, coal recovery at the plant and other geochemical properties relevant for environmental characterisation. In coal operations using continuous mining systems, rock mechanics properties are deemed relevant as these properties directly influence equipment performance. Rock mass hardness and abrasiveness impact directly the system productivity. In some coal mines operational difficulties arise when using coal cutters within zones of high concentration of pyrite concretions due to the difficulties in using continuous systems on these conditions. In extreme situations, high pyrite concentration makes unpractical the use of continuous systems with severe costs penalties if not predicted in advance. This paper presents a methodology to forecast pyrite spatial variability based on geostatistical simulation. Equally probable pyrite concentration models provide the framework to assess the expected fluctuations of this parameters for a given mining plan, reducing the impacts in the scheduling caused by geological fluctuations. A case study in major coal deposit illustrates the methodology.