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Alteration Quartz-Kfeldspar-Apatite-Molybdenite at B Anomaly Prospection with Artificial Neural Network to Determining Molydenite Economic Deposits in Malala District, Western Sulawesi

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Abstract : The Malala deposit in northwest Sulawesi is the only known porphyry molybdenum and the only source for rhenium, occurrence in Indonesia. The neural network method produces results that correspond very closely to those of the knowledge-based fuzzy logic method and weights of evidence method. This method required data of solid geology, regional faults, airborne magnetic, gamma-ray survey data and GIS data. This interpretation of the network output fits with the intuitive notion that a prospective area has characteristics that closely resemble areas known to contain mineral deposits. Contrasts with the weights of evidence and fuzzy logic methods, where, for a given grid location, each input-parameter value automatically results in an increase in the prospective estimated. Malala District indicated molybdenum anomalies in stream sediments from in excess of 15 km2 were obtained, including the Takudan Fault as most prominent structure with striking 40̊ to 60̊ over a distance of about 30 km and in most places weakly at anomaly B, developed over an area of 4 km2, with a 'shell' up to 50 m thick at the intrusive contact with minor mineralization occurring in the Tinombo Formation. Series of NW trending, steeply dipping fracture zones, named the East Zone has an estimated resource of 100 Mt at 0.14% MoS2 and minimum target of 150 Mt 0.25%. The Malala porphyries occur as stocks and dykes with predominantly granitic, with fluorine-poor class of molybdenum deposits and belongs to the plutonic sub-type. Unidirectional solidification textures consisting of subparallel, crenulated layers of quartz that area separated by layers of intrusive material textures. The deuteric nature of the molybdenum mineralization and the dominance of carbonate alteration.The nature of the Stage I with alteration barren quartz K-feldspar; and Stage II with alteration quartz-K-feldspar-apatite-molybdenite veins combined with the presence of disseminated molybdenite with primary biotite in the host intrusive.

Keywords : molybdenite, Malala, porphyries, anomaly B
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