

Mineralogical And Geochemical Study of Andesite Alteration Zone in Bukit Mantri Gold Mine, Balung, Sabah

ABSTRACT

This paper highlights the geochemical compositions and mineralogy of the alteration zone of the andesitic host rock and volcanic breccia in Bukit Mantri area near Balung, Tawau, Sabah, where a gold mining project is now taking place. Minerals identified by XRD analysis include quartz, pyrite, K-feldspar, muscovite, chlorite, kaolinite, hematite, and goethite, while thin section analysis confirms the abundance of pyrite. XRF and ICP-OES analyses suggest a significant concentration of SO₃, Cu, Pb, Zn and As, with average values of 2.68wt%, 254µg/g, 236.9µg/g, 232.9µg/g, and 30.6µg/g, respectively, in the hydrothermally altered andesite. The widespread presence of pyrite and higher concentration of SO₃ provide insights for environmental control for its higher acidity generation potential. Meanwhile, secondary minerals such as iron and aluminium oxides and silicate minerals may provide acid buffers and reduce the dispersion of constituents.