

Character, distribution, and origin of hydrothermal alteration associated with the Brunswick No. 12 deposit, Bathurst, New Brunswick

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At the Brunswick No. 12 massive sulphide deposit, four alteration zones have been recognized. The most distal alteration facies (zone 4) is characterized by the replacement of K-feldspar phenoclasts in the crystal-rich tuffs by chessboard albite, phengite, Mg chlorite, and quartz. These rocks are slightly enriched in Na, Fe, Mn, S, CO₂, base metals, and possibly Mg, and depleted in K, Ca, Ba, and Sr. Zone 3 alteration (proximal-distal) is characterized by the replacement of albite by Fe-Mg chlorite, phengite, and quartz. This zone is enriched in Fe, Mn, S, CO₂, and base metals and depletion of Na, Ca, K, Ba, Rb, Sr, and La. The Fe/(Fe+Mg)

ratio, chlorite abundance, and sulphide veins/disseminations increases toward the vent facies alteration zone (zone 2). Pervasive, Fe-rich chloritic and heterogeneous silicic alteration is intimately associated with the sulphide stringer zone (vent-proximal; zone 1). The sulphide vein networks are well preserved in the silicified zones, which behaved more competently than other footwall rocks during deformation. The various types of alteration reflect the interaction of buoyant, high-temperature, weakly-acidic, Fe-rich fluids with the keratophyricallly-altered footwall felsic volcanoclastic rocks.