

Geology of the B baseline zone, Walton Cu-Pb-Zn-Ag-Ba deposit, Nova Scotia, Canada¹

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The Walton Ba-Cu-Pb-Zn-Ag deposit, Nova Scotia (production 4.5 million metric tons (Mt) >90% BaSO₄ and 412,850 t @ 0.52% Cu, 4.28% Pb, 1.29% Zn, and 350 g/t Ag), is hosted by Viséan age carbonate rocks of the Macumber Formation and its associated breccia. The Macumber Formation in the Walton area is divided into two units, the lower Macumber, a laminated carbonate unit 9 to 12 m thick and the upper Macumber, a synsedimentary carbonate slump breccia that forms two mounds up to 21 m thick.

Outside the immediate mine area the carbonate is either limestone or dolostone: the Macumber Formation surrounding the deposit has been altered to manganiferous siderite. Although three textural type of siderite are recognized, little variation in bulk chemical composition is evident among them.

Minerals were deposited in the sequence: barite, pyrite-marcasite, sphalerite, galena, tennantite, chalcopyrite, and (para)rammelsbergite. Each mineral replaces earlier minerals to varying degrees.

Based on barite and metal content two main ore types are defined. Type I, with a bulk composition of 0.3 percent Cu, 2.5 percent Pb, 0.2 percent Zn, and 31.2 percent BaSO₄, comprises barite and variable sulfide contents. Type II, comprised of sulfides only, has a composition of 0.5 percent Cu, 0.5 percent Pb, 0.1 percent Zn, 51 g/t Ag, and no barite. Type I ore forms a roughly conformable sheet which straddles the upper Macumber-lower Macumber contact and contains lenses of Pb- and Cu-rich ore. Type II ore is most commonly associated with the upper Macumber mounds when it forms large pods which cut the type I ore zone. Type II ore also occurs within the underlying Horton Group sandstones but only when the upper Macumber mounds have developed. There is also a stratigraphic zonation in metal content inasmuch as all metals are higher, on average, in the lower Macumber relative to the upper Macumber.

The host stratigraphy is steeply dipping and faulted and both features are considered to be postore events. Karsting, which also postdates mineralization and probably folding, has removed portions of the stratigraphic upper parts of the deposit. The cavities produced by this process are now partially filled with sand and limestone breccia.

¹In: *Economic Geology*, v. 93, 1998, p. 869-882

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