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**GEOLOGICAL SETTING AND GENESIS OF SEDIMENTARY EXHALATIVE BARITE
AND BARITE-SULPHIDE DEPOSITS, GATAGA DISTRICT,
NORTHEASTERN BRITISH COLUMBIA**

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Thick westward prograding clastic wedges were deposited along the margin of ancestral North America from mid-Proterozoic to mid-Paleozoic time. Periodic rifting and tectonic subsidence resulted in the formation of starved sub-basins along this otherwise passive continental margin. These sub-basins host important sedimentary exhalative barite-zinc-lead-silver deposits. In northeastern British Columbia, a thick succession of Paleozoic basinal facies clastic rocks is preserved within the northwest-trending Kechika Trough. Within the trough, sedimentary exhalative barite and barite-sulphide deposits occur in starved basin sediments of Middle Ordovician, Early Silurian, and Late Devonian age. The last are the most economically significant and are hosted by carbonaceous cherty argillites and siliceous shales of the Middle to Late Devonian Gunsteel Formation of the Lower Earn Group. The largest deposit, Cirque, has reserves in excess of 35 million tonnes averaging 10% (Pb+Zn) and 47 g/t Ag. Other potentially significant deposits include Driftpile Creek, Bear, Mt. Alcock, Fluke, Pie and Elf. Stratiform barite deposits are also common, particularly near the basin-to-shelf transition zone. The Late Devonian barite-sulfide deposits typically are zoned: interlaminated barite-sphalerite-galena-pyrite occurring near suspected vent areas grades outward into bedded barite. Laminated beds of pyrite typically occur in hanging-wall siliceous shales, particularly above the inferred vent zone. The apparent absence of epigenetic stringer sulfide zones and footwall alteration implies that the deposits were formed from ponded brines at relatively low temperature. Away from the main deposits, the favourable stratigraphic interval is marked by the presence of thin beds of nodular and laminated barite and thin laminae of pyrite. Thin tuff beds also occur locally in this stratigraphic interval and are evidence for a Late Devonian volcanic event. A paleogeographic reconstruction of the Kechika Trough in Late Devonian to Mississippian time suggests that the barite-sulphide deposits formed in third-order starved basins between uplifted, northwest-trending horst blocks that were capped by shallow-water carbonate banks. The presence of intraformational breccias suggests that fault movement accompanied barite-sulfide precipitation. This tectonic activity may have allowed the escape of heated, over pressured metalliferous brines from permeable reservoirs within the sedimentary pile. Sedimentary exhalative deposits formed where these brines were exhaled as buoyant plumes onto the seafloor, cooled, and ponded in anoxic seafloor depressions.

eg. Kwadacha

- Miogeoclinal rift trough
- multiple orogen events
- starved basin env.
- assoc. with rifting
- continental environment (basin floored by continental crust)
- commonly contemporaneous rifting w/ or w/out volcanism