From The Mineral Inventory Files

Fraternal Twins in Brookfield

Fraternal twins, although not identical, share many common characteristics. Most notably, they were formed together and share the same parents. I believe a geological analogue to this situation exists at the Brookfield barite-siderite deposit in Colchester County, and the immediately adjacent Chambers and Pearson iron mine (Fig. 1). When looked at separately, one could easily conclude that they are unrelated. But when one considers all their geological features, and the ore-forming environments that these features reveal, there is a strong case to be made that both deposits formed at the same time and from the same mineralizing event (the parent).

The Brookfield barite ($BaSO_4$) - siderite ($FeCO_3$) deposit, which has been producing pharmaceutical-grade barite for E-Z-EM Canada Inc. since 1979, occurs as a pipe-like body of barite-siderite veins and breccia, localized along a pronounced east-trending fault zone (Fig. 1). The deposit is hosted by Carboniferous siltstone and sandstone of the Horton Group, immediately below the contact with overlying marine carbonates and evaporites of the Windsor Group. Intense bleaching and hydrothermal alteration of the extensively faulted host rock is obvious adjacent to the barite. The barite-siderite deposit has a strong structural control and the east-trending fault on which it occurs is a secondary splay fault associated with the regional Cobequid-Chedabucto Fault Zone (CCFZ).

The Chambers and Pearson iron mine was actually two small-scale iron mining operations found a couple of hundred metres east of the Brookfield deposit (Fig. 1). These iron deposits were mined between 1889 and the early 20th Century and the ore produced was shipped to the blast furnaces at Londonderry, Colchester County, and Ferrona, Pictou County. The Chambers shaft produced about 44,000 tons from a zone of botryoidal hematite and massive reddish hematite 92 m long by 12-25 m wide and a minimum of 60 m in depth. A hematite-siderite zone at the Pearson mine produced somewhat less ore than the Chambers operation from a zone 6-13 m wide and 90 m long. Both deposits carried significant barite mixed with hematite, especially toward the west end of the deposits. Like the barite in the Brookfield deposit, the iron-oxide veins have an obvious relationship to the east-trending fault traversing the area of both deposits.

The ubiquitous presence of barite in both deposits, as well as their identical style of mineralization and association to the same fault zone, strongly suggest a genetic link. Both deposits formed from an Fe- and Ba-rich hydrothermal fluid. In one (Brookfield) the Fe is manifest almost entirely as siderite, whereas in the other (Chambers and Pearson) the Fe is manifest as hematite and lesser siderite.

This raises an interesting dilemma. Looked at separately, one could easily draw contrasting conclusions as to the origins of these deposits. The Brookfield deposit could be termed an example or "indicator deposit" of a typical carbonate-hosted base metal environment such as is found at the Walton Ba-Zn-Pb-Cu-Ag deposit. Conversely, the Fe-oxide mineralization at the Chambers and Pearson deposit is essentially identical to that found at most of Nova Scotia's many past-producing Fe districts (e.g. Londonderry). These Fe districts, however, are considered as "indicator deposits" typically found within iron oxide-copper-gold (IOCG) terrains. What is the connection? Perhaps there is a genetic relationship between these two widely sought-after deposit types. It's worth considering, and is surely a subject for another story down the road some time.

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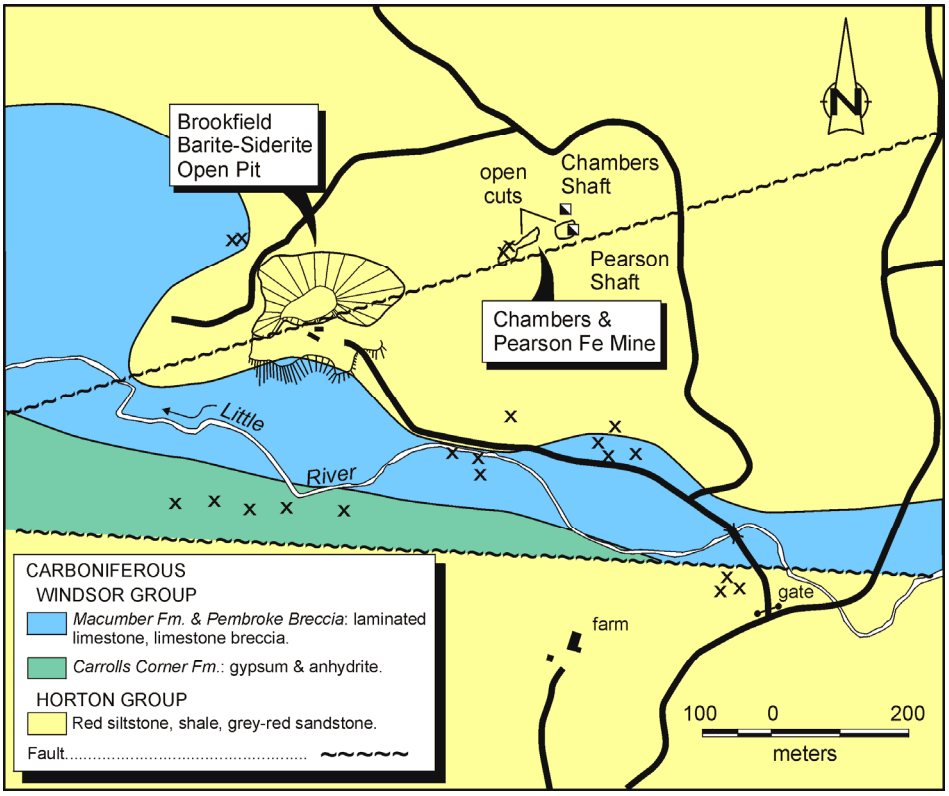

***Figure 1**. Geological map of the Brookfield area, Colchester County.*