

**Petrography and Geochemistry of Anhydrite from the Pugwash Salt Mine, Pugwash,
Nova Scotia**

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Evaporites exposed in the workings of the Canadian Salt Co. mine at Pugwash Nova Scotia have been the subject of a number of studies, but only limited petrographic and geochemical work has been done on anhydrite from the deposit. Based on internal characteristics observed in both the mine workings and drill core, three anhydrite units are recognized macroscopically and have been informally termed the shaft, borate and third anhydrites.

The shaft anhydrite is characterized by the following textures: (1) microcrystalline, associated with minor blocky, felted, aligned-felted and lath shaped crystals; (2) nodular, showing displacive growth within carbonate and dolomite laminae; and (3) laminated, with alternations of carbonate and anhydrite. The shaft anhydrite has dark organic-rich laminae crosscut by veinlets filled with coarse, crystalline anhydrite.

The borate anhydrite exhibits three separate habits that do not show intimate association as in the shaft anhydrite. The habits are: (1) microcrystalline, (2) felted and (3) aligned-felted. Peculiar to the borate anhydrite is the arrangement of coarse, ragged laths of anhydrite in fibroradiate groups and the presence of small, round, opaque aggregates of danburite crystals is unique to this unit.

The third anhydrite is texturally similar to the borate anhydrite, exhibiting felted and aligned-felted textures. However, the third anhydrite does not contain borate nodules and possesses more consistent and well defined alignment of anhydrite laths within aligned-felted portions. The highly ordered alignment of anhydrite laths in this unit is very distinctive and has not been observed in the other two anhydrites. In contrast to the shaft and borate anhydrite units, where nodules are invariably surrounded by carbonate, nodular mosaic portions of the third anhydrite contain microcrystalline nodules surrounded or rimmed by aligned-felted anhydrite crystals.

Statistical analysis of geochemical data shows that each unit exhibits distinct chemical characteristics. The shaft anhydrite is the most inhomogeneous, contains the highest concentrations of several trace and minor elements and has the highest carbonate content. The third anhydrite is the most homogeneous, with low concentrations of almost all elements and the highest gypsum content. The borate anhydrite is intermediate in composition but has the highest halite content.