

A second, less pronounced, transgression resulted in a refilling of the basin and the deposition of a 10 m anhydrite unit with minor limestone, 100 m of halite (Penobsquis salt), and a grey claystone, up to 20 m thick. This marks the end of marine deposition in New Brunswick.

The anhydrite unit is of particular practical interest from a mining point of view as it represents an important component of the impervious barrier between the underlying soluble salts and the overlying water-bearing Mabou Group. In informal mining terms this barrier is referred to as the “caprock”. This caprock ranges from a massive microcrystalline anhydrite, as part of the normal stratigraphy, to a strongly deformed anhydrite/claystone breccia in a clay matrix intermixed with clasts from the overlying Mabou siltstones together with insolubles left from dissolution of the underlying salts.

The caprock helps tell the story of the depositional and structural history of the uppermost Windsor Group evaporites in this part of the Maritimes Basin. Stratigraphically it records details of the second, minor, marine flooding of the subsiding Penobsquis/Picadilly subbasin, on the finely laminated shallow water salts at the top of the Cassidy Lake Formation.

The caprock also helps record details of the structural history. Within the subbasin, salt withdrawal in the north and its up-dip migration was encouraged by remobilization of the Petitcodiac Fault and insertion of a wedge of Horton Group sedimentary rocks within the evaporite package. While the salt body as a whole acted as a mobile unit most movement took place within the potash horizon. This led to development of a strong fabric, together with km-scale recumbent folding, coalescing limbs and nappe structures.

Buckling of the mobile salt body formed a salt wall, while shearing of the potash horizon continued, extending upwards, through the caprock and overlying Mabou Group sedimentary rocks. This breaching of the caprock allowed dissolution of the crest of the salt wall, followed by karst development and eventual collapse to form an elongate graben-like feature filled with brecciated siltstone. This history is recorded in the caprock directly overlying the collapsed salt wall. Here, the caprock retains evidence of the shearing initiated in the potash, together with collapse of the salt wall, leading to incorporation of Mabou Group sedimentary rocks, and dissolution of much of the Cassidy Lake Formation sequence, leading to incorporation of the insolubles from these salts.

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### “Caprock”

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In southern New Brunswick two marine transgressions resulted in Windsor Group evaporites being deposited in local subbasins. The main evaporite sequence is composed of a basal limestone unit (Macumber Formation) a few tens of metres thick, overlain by up to 200 m of massive anhydrite (Upperton Formation), which in turn is overlain by up to 500 m of salts (Cassidy Lake Formation). The various members of the salt sequence, progress from the deep water clean basal halite, through the argillaceous middle halite, and potash (sylvinite ore zone ± carnallite), to the shallow water heterogeneous finely laminated halite + sylvinite + anhydrite + borates.