The role of chance in exploration: the McCully #1 gas discovery – an example from southern New Brunswick

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A significant gas discovery near Sussex, New Brunswick, was announced in late 2000. The steps leading to this discovery represent an interesting mix of science and serendipity. In the early 1970s the Province of New Brunswick drilled a series of holes on gravity minima suspected of representing Windsor Group, and Albert Formation, salt deposits. The first hole, at Plumweseep, was drilled off the intended target, the crest of the evaporite structure, because of poor quality geophysical data available at the time. However, this resulted in the intersection of a thick sylvinite section within the evaporite sequence, leading to further exploration and eventually to a significant mine being developed east of Sussex.

A recent brine leak into the mine resulted in a 3-D seismic program being carried out, in 1999, to examine the structure of the caprock above the inflow area. The seismic data also showed a potential brine disposal target, at depth, in the unexplored, underlying Horton Group (?). This target was drilled (McCully #1) but the lithology was found to be a tight siltstone, unsuitable for brine disposal. However, beneath these siltstones, more than 40 m of natural gas bearing sands were intersected. The thickness of the sands, together with their aerial extent, and the in situ gas pressure, indicate that the reserves are extensive. The gas discovery in a Horton basin-centre/sub-Windsor salt setting is leading to a shift in gas exploration priorities, together with plans for increased seismic data acquisition and drilling in the area.