

The Unexpected Silurian-Devonian Structural Style in Western Gaspé – New Insight for Promising Hydrocarbon Plays

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Recently, from shallow diamond core wells, two junior companies encountered notable oil shows (54° API) within open fractures. This area has a very low oil and gas exploration maturity. In order to visualise the geological and hydrocarbon framework of the area, the Secteur Énergie of the Ministère des Ressources naturelles du Québec conducted a regional seismic survey, totalling 98 kilometres, where eight geophysical seismic reflection profiles had been acquired in October 2000.

A mega-transect totalling 45 km long was realised from four seismic profiles to allow the construction of a continuous geological subsurface cross-section from NW to SE of Connecticut Valley-Gaspé synclinorium.

For the first time in Western Gaspé, the mega-transect gives a picture of the unexpected subsurface structural complexity of the Silurian rocks. The first observation coming out from the transect is the possible triangular zone that outlines a large envelope of stacked Silurian formation of Val-Brillant (nearshore sandstone) and Sayabec (carbonate ramp). We recognise a possible "beam" of Val-Brillant-Sayabec Fm. on the southern flank of Lac Mitis Syncline that plays as a tip of the triangular zone. A pop-up structure and many duplexes of the Val-Brillant-Sayabec Formation are well exposed within the envelope.

The Silurian Val-Brillant-Sayabec stacked formation seems to be promising for hydrocarbon exploration. The foreseen target window can be observed between depths of 1 500 to 5 000 meters. One direct hydrocarbon indicator is well depicted on the Lac Humqui Anticline. This anticline shows, within the Val-Brillant-Sayabec seismic signature, an amplitude anomaly and a notable flat spot marker at 2 500 m deep.