

Regional Geochemical Evaluation of the Ordovician Utica Shale Gas Play in Quebec

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The Ordovician Utica Shale was deposited throughout the Appalachian Basin during the Taconian Orogeny. In the Province of Quebec, where it covers over 10 000 square kilometers, the Utica Shale occurs at depths ranging from surface (northwest) down to over 4 km (southeast). Its thickness generally varies from 75 to over 350 meters in the deeper parts of the basin. The Utica is a thermally mature, organic-rich black shale that is considered to be the source rock for Devonian to Ordovician hydrocarbon production and shows in Quebec. Based on well log data, well samples and outcrops, the Utica Group has been informally subdivided into different formations, as is the case in Ontario and New York. Rock-Eval analyses were performed on 50 outcrops and more than 60 wells (>700 cuttings samples) to evaluate the regional geochemical variability of the Utica Shale, and ultimately to identify "sweet spots". XRD analyses were also carried out to determine the mineralogical composition of the shales. Preliminary results show that the Utica has TOC values generally ranging between 0.3 and 5 percent (average of 1.2% TOC), with 25% of the values being above 1.5% TOC. The mineralogy consists mainly of illite, calcite and quartz, which suggests good "fracturability" potential. Isopach and isocontour maps (i.e. TOC, Hydrogen Index, Transformation Ratio) have been produced in order to identify exploration fairways. Complete results of this work will be published in a final report by the end of 2008, which will include a database, coloured maps and composite logs.