

## **Assessment of the “Passey method” for discrimination of organic-rich intervals in wells from offshore Newfoundland (Canada)**

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Sonic and resistivity borehole wireline data can be used to obtain information about the location and amount of organic matter in a determined sedimentary series. The “Passey method” ( $\Delta \text{Log R}$ ) is a specific approach to source rock analysis, where a scaled porosity log (usually sonic transit time curve) and a resistivity curve (preferably from a deep-reading tool) are overlain and calibrated to estimate the amount of organic matter in a given stratigraphic interval. The “Passey method” can be used to differentiate mature and immature source rocks, determine TOC content and organic matter type.

The Jeanne d’Arc Basin, located off the eastern coast of Newfoundland, has been proven to contain a large amount of oil and gas, producing from multiple fields. A significant source rock for this basin is thought to be the Egret Member (Upper Jurassic) of the Rankin Formation. The Egret Member is organic-rich shale that was deposited during a marine transgression in the Late Jurassic. The proven reservoirs in the Jeanne d’Arc Basin are Upper Jurassic (Jeanne d’Arc and South Tempest sandstones) and Cretaceous (South Mara, Ben Nevis, Avalon, Catalina, and Hibernia sandstones).

In this study, we have analyzed several wells from offshore Newfoundland to test the applicability and limitations of the “Passey method”. The dataset includes lithological and biostratigraphic data, gamma-ray, resistivity, and sonic (representative of porosity) logs, and geochemical data (primarily TOC). Preliminary results from the well Egret K-36 show that there are a few intervals where a relationship between porosity logs and resistivity can be observed, including the Egret Member of the Rankin Formation.

The results and methodology from this study, linking source rock intervals identified by the “Passey method” in close proximity with oil and gas accumulations, can be applied to the Nova Scotia margin where there are current oil exploration programs.