

Geochemistry and Isotopes in Lower Cretaceous Formation Waters of Southeastern Alberta

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ABSTRACT

The chemical and isotopic composition of formation waters is of growing importance in oil exploration. The mapping of these compositions can be an aid to indicating the degree of communication between formations, the degree of influence of non-formation waters, and possible structural controls. Geochemical maps may also outline areas of bacterial activity, indicating heavier oils. A project was undertaken to map the geochemical and isotopic distributions of formation waters within the Palliser block of southeastern Alberta. A smaller area, bounded by townships 12 - 23, and ranges 10 to 18 was mapped in more detail, as were selected pools within the Basal Quartz of the Lower Mannville formation. The main focus of the study was the Basal Quartz, but data within the Upper Devonian, Mississippian, and Glauconitic of the Upper Mannville were also mapped and examined. The isotopic compositions of the formation waters were studied, with the idea that individual formation waters may have distinct isotopic signatures, which can aid in determining the formation which is producing. Possible structural controls on the distribution of formation water composition will be briefly examined.