

Regional Vitrinite Thermal Maturity Trends in Eagle Plain, Yukon

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Summary

Since the seminal work of Link and Bustin (1989), little systematic analysis of thermal maturity has been carried out in Eagle Plain. Since 2009, the GEM Yukon Basins Project has acquired over 100 new organic petrology/vitrinite reflection data (Reyes et al., 2012) in conjunction with organic geochemistry and biostratigraphy as part of a larger study of the basin's evolution and petroleum systems. Recycling of organic matter is ubiquitous in the basin; and cuttings samples present the risk of caving. Nonetheless, several patterns are evident in the data, basinwide. In nearly all wells, mid-Cretaceous strata are within the oil window ($R_o > 0.5\%$); and in wells that extend through the Canol Formation, reflectances at that level vary between $\sim 0.8\%$ (N. Parkin D-61) to $\sim 1.8\%$ (Blackstone D-77). None of the wells show a thermal discontinuity at the sub-Mesozoic unconformity, including wells in the central and northern part of the basin where Albian strata lie with angular unconformity on Early Carboniferous rocks. This demonstrates that the thermal peak post-dates mid-Cretaceous time throughout the basin. At the level of the sub-Mesozoic unconformity, reflectances vary from $\sim 0.4\%$ in several wells, up to $\sim 1.0\%$ (N. hope N-53). However, there appears to be little correlation between thermal maturity and present burial depth. This is consistent with previous interpretations (e.g., Link and Bustin, 1989) and with new outcrop data that indicate much higher reflectances, near $3\% R_o$, in exposures at the Canol stratigraphic level along the western flank of the Richardson Mountains (Fraser et al, 2012) due to Early Tertiary tectonic exhumation of the range (e.g., Lane, 1998).

References

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