

Refinements to Lithostratigraphy, Biostratigraphy and Structural Geometry of the Devonian and Carboniferous Imperial and Tuttle Formations, Eastern Eagle Plain, Northern Yukon

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New fieldwork was undertaken in Eastern Eagle Plain, northern Yukon, to clarify the map distributions, stratigraphic relationships and structural geometry of Late Devonian and Early Carboniferous successions, and to facilitate the mapping of their projection into the subsurface of the basin. In this area of limited outcrop, the Late Devonian Imperial Formation comprises a three-fold succession, with a sandstone-dominant middle member lying between two shale-dominant members; however, due to limited exposure, the lateral continuity of individual sand units is uncertain.

The overlying Late Devonian to Early Carboniferous Tuttle Formation comprises a succession of interbedded sandstone-conglomerate and shale units. In this area, distal from its depocentre, the Formation consists of a lower part containing two thick sandstone-conglomerate units, separated by a recessive area presumed to be underlain by shale. The upper part consists of thinner sand ribs embedded in dark grey shale with siltstone laminae. The Tuttle Formation grades upward and laterally toward the southwest into the Ford Lake shale. The base of the Tuttle lies immediately above a shale succession dated palynologically as late Famennian (Late Devonian) to Tournaisian (Early Carboniferous). Elsewhere, a shale within Tuttle strata yielded a similar palynoflora. In the field area, the top of the Tuttle lies within a succession yielding Viséan (Early Carboniferous) palynoflora.

In eastern Eagle Plain, Tuttle strata are juxtaposed against the Imperial Formation along the Deception Fault, a large west-directed thrust fault associated with uplift of the Richardson anticlinorium in Early Tertiary time. Its position and orientation suggest that it reflects strain

concentration near the carbonate-shale facies transition in the underlying lower Paleozoic succession. Although the fault is not exposed at the surface, the sampling has helped to refine its approximate position. Thermal alteration indices (TAI's) of palynomorphs increase from 2 ("oil window") in the west, to 3+ ("dry gas generation") in the east, indicating substantial post-maturation vertical separation across this regionally important structure.