Proterozoic to Devonian Stratigraphic Evolution of Southeasternmost Yukon Territory: New Insights From Surface Mapping

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ABSTRACT

Mapping conducted during the Geological Survey of Canada's Central Foreland NATMAP Project has significantly clarified the pre-Carboniferous stratigraphic history of southeasternmost Yukon Territory. In earlier reports, strata that lie below the Devono-Carboniferous Besa River Formation were included in a small number of very thick, "lumped", informal map units. However, mapping in the Larsen Lake (NTS 95C/4) and Pool Creek (NTS 95C/5) map areas indicates that at least twelve Devonian and older map units can be delineated.

Proterozoic sedimentation is recorded by at least two map units. One of these contains abundant quartz sandstone and is generally of platformal aspect. The other is argillite-dominated, with abundant slump-folded intervals and basalt-clast breccia beds, recording deposition on a volcanic-influenced slope. Although the stratigraphic relationship between these two map units is unclear, both are demonstrably intruded by the c. 650 Ma Pool Creek syenite. In Pool Creek map area, Proterozoic strata may have locally stood high but were demonstrably covered by the early Ordovician. By contrast, high-standing Proterozoic strata in the southern part of Larsen Lake map area, closer to the British Columbia border, were not covered until the Silurian.

The base of the Palaeozoic succession is variably a disconformity, a nonconformity, and a probable angular unconformity. The oldest Palaeozoic strata in the region are dominantly siliciclastic (sandstone, siltstone, and conglomerate) with lesser carbonate strata and are probably of shelf to non-marine origin. Age constraints on these strata are sparse but lower parts of the unit may be of Cambrian age, whereas upper parts have been dated as Early to early-Middle Ordovician. This dominantly siliciclastic depositional system was replaced by a carbonate platform during deposition of the Middle Ordovician Sunblood Formation. Another sandstone-dominated map unit, of inferred Late Ordovician age, caps the Sunblood Formation.

In southern and eastern parts of the study area, a second, long-lived phase of carbonate-platform sedimentation commenced during the Silurian. Stratigraphic nomenclature used in northern British Columbia can be applied to this part of the succession in southern Larsen Lake map area. Units recognised are, in

ascending order, the Silurian Nonda Formation, the Siluro-Devonian Muncho-McConnell Formation, and the Devonian Stone and Dunedin formations. However, in northern Larsen Lake map area and in Pool Creek map area, the succession above the Nonda Formation cannot be subdivided consistently and is treated as an informal "Beaver River map unit".

In the northwestern corner of the study area, Silurian and Devonian slope to basinal sedimentation is recorded by dark-weathering, recessive shales of the Road River Group. These strata reflect the development of the Meilleur River Embayment of the Selwyn Basin. The position of the platform margin was apparently relatively stable until the beginning of the Middle Devonian, when carbonate platform facies prograded markedly to the northwest. Carbonate platform deposition throughout the study area terminated with the onset of deposition of shales of the Besa River Formation.