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GEOLOGY AND MINERAL DEPOSITS OF THE NORTHERN KECHIKA TROUGH BETWEEN GATAGA RIVER AND THE 60th PARALLEL

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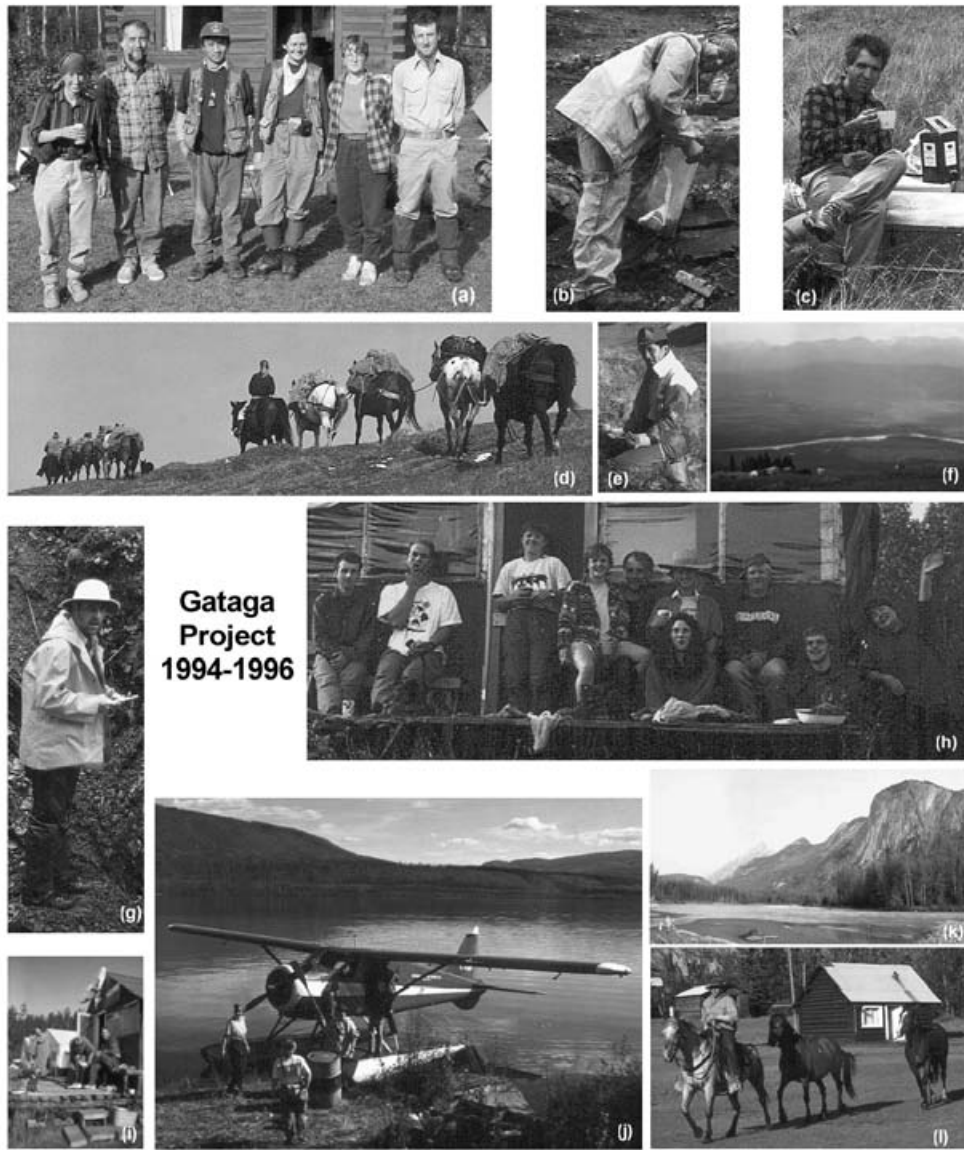
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Frontispiece

(a) The 1995 field crew: (left to right) JoAnne Nelson, Andrew Legun, Eric Hou, Carole Augereau, Suzanne Paradis (Geological Survey of Canada) and Chris Rees. (b) Chris Rogers on a rainy day along the Red River canyon, July 1996. (c) The senior author contemplates setting up flycamp, August, 1995. (d) Andrew and JoAnn Knox move camp, east of Gataga Mountain, July, 1995. (e) Eric Hou cooks supper east of Gataga Mountain, July, 1995. (f) Andrew Knox and Andrew Legun admire the Northern Rocky Mountain Trench and the distant Cassiar Mountains from the western slopes of Gataga Mountain, June, 1995. (g) Chris Rees examines Cambrian siliciclastics on a rainy day, August, 1994. (h) The 1996 field crew: (left to right) Chris Rees, Chris Rogers, Hilda Reimer, Andrea Mills, Andrew Legun, JoAnne Nelson, Amy Thibeault (seated), Frontier Helicopter pilot, Jeremy Valeriote, Dorthe Jakobsen. (i) Dorthe Jakobsen, Hilda Reimer and Chris Rogers prepare for an assault on Tatisno Mountain, July, 1996. (j) A Beaver brings in supplies to the Graveyard Lake camp, July, 1996. (k) Looking north along the Gataga River valley, 10 kilometres upstream from its confluence with the Kechika River, August, 1994. (l) Andrew Knox rounds up some horses in preparation for moving camp from Terminus Mountain to the west side of Gataga Mountain, June, 1995.

ABSTRACT

The Kechika Trough represents a Lower Paleozoic basin developed between the MacDonald Platform to the east and the Cassiar Platform to the west. This basin was well established by Late Cambrian time and ceased to be a depositional entity at the beginning of the Late Devonian. Mapping along the western part of the trough, between the Gataga River and the 60th parallel, encountered layered rocks of Proterozoic to Cenozoic age. These include: Late Proterozoic siliciclastics, carbonates and volcanics; siliciclastics and carbonates of Cambrian age; Late Cambrian to Early Ordovician calcareous argillites and argillites of the Kechika Group; slate, siltstone and minor limestone of the Middle Ordovician to Middle Devonian Road River Group; Late Devonian to Early Mississippian argillite, chert and minor limestone of the Earn Group; chert, tentatively assigned to the Mississippian to Permian Mount Christie Formation; conglomerate and sandstone of possible Tertiary age; and Tertiary to Quaternary mafic volcanics assigned to the Tuya Formation. Intrusive rocks represent a very minor component of the map area and consist of Early Paleozoic sills and dikes of gabbroic composition, feldspar porphyry dikes of Cretaceous or Tertiary age and small Early Cretaceous stocks, dikes and sills of broadly granitic composition.

Periodic extensional tectonism during the Paleozoic, which led to the formation and subsequent modification of the Kechika Trough, was followed by intense, easterly directed, compressional tectonics and associated metamorphism of Mesozoic age, resulting in the present structural configuration. Rocks of the trough belong to the Rocky Mountain structural province and structures are dominated by easterly verging folds and thrusts. Thrust faulting predominates in the southern part of the map area where lithologies are dominated by thick, competent Cambrian carbonate and quartzite units. Their disappearance to the north results in a structural style dominated by folding and penetrative cleavage.

Sedimentary exhalative mineralization (sedex) represents the most important mineral deposit type found within the Kechika Trough, ranking it, and the more northerly Selwyn Basin, as one of the most important metallogenetic belts of the Canadian Cordillera. These stratiform Zn-Pb-Ag-Ba deposits are found at several stratigraphic levels: Cambrian, Middle Ordovician, Lower Silurian and Upper Devonian. Upper Devonian deposits are by far the most numerous and economically important within the map area, and throughout the Kechika and Selwyn basins. The large Cambrian and Early Silurian deposits found in the Anvil and Howards Pass districts, respectively, highlight the potential that all these horizons have for hosting economically significant sedex deposits. Tungsten - molybdenum porphyry/skarn mineralization related to Early Cretaceous intrusions is the next most important mineral deposit type. Minor lead, zinc and copper-bearing veins are scattered throughout the map area.

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