
ABSTRACTS

PETROGRAPHY AND GEOCHEMISTRY OF SEDIMENTARY ROCKS
OF THE YELLOWKNIFE SUPERGROUP (ARCHEAN),
SLAVE PROVINCE, NORTHWEST TERRITORIES¹

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ABSTRACT

Modal analyses of samples from the lower, middle and upper parts of the Burwash Formation, Yellowknife Supergroup, at Yellowknife Bay, indicate an increase upwards in the amount of components derived from silicic volcanic and plutonic rocks. An accompanying decrease in abundance of mafic volcanic clasts upwards in the Burwash Formation, with none being present in the overlying Walsh Formation, suggests a waning in importance of mafic volcanics as a source for detritus. A high quartz content and a relative increase in plutonic rock fragments in the Walsh Formation suggest that deposition of the Walsh Formation coincided with unroofing of a silicic pluton in the source area. This plutonic body is interpreted to be the "western granodiorite" which crops out west of Yellowknife Bay.

The geochemistry of the Burwash and Walsh Formations indicates that the Walsh Formation sediments are high in silica and soda and low in potash, compared to the Burwash Formation sediments. Secular chemical trends in the Burwash Formation are cyclic, with the lower and upper parts of the formation being similar chemically. Bouma-cycle trends within the Burwash Formation appear to be consistent, showing an increase in abundance of phyllosilicates in the finer grained units. The chemistry of the B, C and D units of the Bouma cycle is intermediate to that of the end member units (A and E). Trace-element data suggest that a mixed terrane of volcanic and plutonic rocks supplied detritus for the sediments of the Burwash and Walsh Formations.

The secular chemical trends within the Burwash Formation, and from the Burwash Formation to the Walsh Formation, are similar to those within the Yellowknife volcanic pile. The similarity in trends is interpreted as indicating that the Yellowknife volcanic pile and/or its lateral extension over the "western granodiorite" was a major source of detritus for the Burwash and Walsh Formation sediments.

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