Geophysical Research Abstracts, Vol. 5, 06848, 2003


# RE-OS ISOTOPIC STUDY OF THE MUSKOX INTRUSION, NWT, CANADA

**J.M.D. Day** (1), L.J. Hulbert (2), D.G. Pearson (1) and G.M.Nowell (1)

(1) The Arthur Holmes Isotope Geology Laboratory, Department. of Geological Sciences, Durham University, South Road, Durham, UK. (2) Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario, K1A 0E8, Canada (j.m.d.day@durham.ac.uk)

The 1270$\pm$4Ma Muskox intrusion is one of the largest layered intrusions in the world and is the intrusive centre the giant Mackenzie-Coppermine-Muskox igneous event, widely attributed to the presence of a mantle plume beneath the north western Canadian Shield during the middle Proterozoic. We have made a detailed Re-Os isotope study of the Muskox intrusion with the aim of constraining the origin and potential triggers for precious metal mineralization in layered intrusions, assessing the role of magma recharge versus crustal assimilation and sulphide participation during mineralization. In the process of understanding these factors, direct inference can be made on the source characteristics of the reservoirs involved during magma genesis, and which feed major continental magmatism events.

Re-Os isotopic analyses have been performed on 32 well characterised samples from drill core which samples the entire stratigraphy of the Muskox intrusion. Initial $^{187}Os/^{188}Os$ span a very restricted range for the ultramafic portion of the intrusion, with $\gamma$Os +3 to +5.5 relative to chondrite. These values are not indicative of crustal assimilation. Os isotopic ratios also show significant shifts at platinum group element enriched horizons. Common Os concentrations show close correlation with major element indices whilst Re concentrations are less systematic and anomalously low in the ultramafic horizons, especially those which have suffered intense fluid alteration. Re-Os isotopic data will also be presented on the keel dyke feeder to the Muskox intrusion and the contemporaneous, voluminous Coppermine volcanics including an andesite glass flow.