

**A MULTI-ELEMENT BASELINE GEOCHEMICAL DATABASE FROM THE  
WESTERN EXTENSION OF THE CENTRAL AFRICA COPPER BELT IN NW  
ZAMBIA.**

Roger Key and Bert De Waele

A stream sediment survey was undertaken in the extreme North-west of Zambia with three primary objectives. These were (1) to provide a baseline geochemical database that can be used to monitor pollution due to (future) mining and agriculture in the region; (2) as an exploration tool for base and precious metals and for uranium; (3) to provide a tightly controlled multi-element geochemical data base that can be used as a standard for future geochemical exploration elsewhere in central Africa.

The extreme north-western part of Zambia is an unspoilt rural area with no history of mining nor of modern intensive agriculture. It is sparsely populated, and local people have maintained a traditional lifestyle with small fruit and vegetable gardens and small stocks of animals. A well-developed dendritic drainage network forms the headwaters of the upper Zambezi River and provides an abundant supply of clean water for the local people. Therefore the stream sediments from this unpolluted area represent uncontaminated samples.

Three major geological domains underlie the studied area. These are a crystalline Neoproterozoic to Palaeoproterozoic basement, overlying Neoproterozoic Katanga strata within the western part of the Lufilian Arc orogen and extensive Kalahari Group sands and cretaceous deposits. 3024 stream sediment samples were collected from an area of about 13,500 km<sup>2</sup> and analysed by ICP-MS for 40 elements. The samples were also analysed for gold and PGE metals by Fire Assay, and for uranium by XRF. Samples were wet sieved in the field and the <math>-100\mu\text{m}</math> fraction was bagged for analysis.

Enhanced values of a large number of metals are present in the stream sediments underlain by Katanga group strata including significant, not previously known copper anomalies that warrant detailed follow-up work. The high metal values in sediments derived from Katanga strata contrasts sharply with sediment samples collected from drainage channels in areas of thick Kalahari sand, which have very low metal values. A number of uranium and rare earth element anomalies were found in areas underlain by the pre-Katanga crystalline basement of Neoproterozoic to Palaeoproterozoic age.