Ansdell K, Kyser TK, Wasyliuk K, Zaluski G, Quirt DH, Kotzer TG, 2017, Some highlights from the CMIC Footprints project at the Uranium site: in commemoration of Kurt Kyser , Abstract, SGS Open House, Saskatoon, SK

The Canadian Mining Innovation Council (CMIC) Mineral Exploration Footprints Research Network is a consortium of about 70 faculty, research associates, graduate and undergraduate students from 24 Canadian universities, numerous subject matter experts from 15 mining and mineral exploration companies, and 15 geochemical, geophysical, and software service providers. The objective of the Footprints project is to develop more effective methods to identify, integrate, and visualize multi-parameter geological, structural, mineralogical, geochemical, petrophysical, and geophysical data in order to better define the footprint of an ore system and vector from the distal margins to the high-grade core. The focus has been on the integration and analysis of data sets at the Canadian Malarctic stockwork-disseminated gold deposit in Quebec, the Highland Valley porphyry copper system in British Columbia, and the McArthur River-Millennium unconformity-related uranium deposits in the Athabasca Basin, northern Saskatchewan. With the sudden passing of our dear friend and colleague Dr. Kurt Kyser on August 29, 2017 we would like to commemorate the many years of research he led toward understanding the complex origin and evolution of unconformity-related uranium deposits in the Athabasca Basin, and his work in developing new methods to explore for these deposits. The aim of this presentation is to provide a summary of some of the highlights from the Footprints project at the Uranium site, but the focus will be on projects with which Dr. Kurt Kyser was most involved. For example, geochemical investigations utilizing legacy and new lithogeochemical data from the sandstones in the Athabasca Basin has confirmed previously identified 'footprint' pathfinders, but the use of Mg/K, Mg/Al and K/Al molar ratios has refined the sandstone alteration footprints of the Millennium and McArthur River uranium deposits, and provided insights into the differences in the characteristics of the two deposits. Extension of the footprint to surface is complicated by the presence of distally and proximally sourced tills. Airborne radiometrics has been used to discriminate these tills and may be useful in resolving subtle alteration signatures in the glacial deposits. New sampling has confirmed radiogenic lead isotopic and uranium anomalies in the various media (soils, tree cores and boulders) directly above the McArthur River deposit, and investigations of fractures in the sandstones, classified based on colour and mineralogy, provides evidence of pathways for primary and secondary dispersion of specific elements and radiogenic lead in the sandstones and towards the surface. Overall, unravelling the footprint at the Uranium site is complicated because the mineralization is located at depths of about 500 metres, in contrast to the gold and copper sites where it is close to surface. Preliminary results of the various subprojects have been presented at conferences and as theses, and comprehensive publications will be forthcoming after the end of the project in 2018.

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