Preliminary Petrology of the Pikoo Kimberlites, Saskatchewan

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The Pikoo kimberlites, located in east-central Saskatchewan, are set in the Precambrian Shield of the Trans-Hudson Orogen and underlain by the Sask Craton. Claims in the Pikoo area were first staked in 2011 and the first discovery of kimberlite didn't occur until 2013, meaning no in-depth study on the petrology and chemistry of the Pikoo kimberlites has been published. Ten discreet kimberlite occurrences have been identified by North Arrow Minerals, five of which have proven to be diamondiferous. Partial results for PK346 indicate less favourable microdiamond results and a much lower total number of stones recovered in comparison to PK150, which is currently considered the most significant discovery to date (http://www.northarrowminerals.com/projects/pikoo/). These two occurrences of different grade were examined in greater detail using thin sections to describe the rocks petrographically and electron probe microanalysis (EPMA) to characterise mineral chemistry.

Many traditional approaches to characterizing a new kimberlite discovery are not applicable to Pikoo because the rocks have undergone an intense degree of pervasive alteration. Olivine, perovskite, and groundmass spinel have been altered or replaced while chrome diopside and chromite are not present. Despite these difficulties, PK346 and PK150 have proved to be petrographically distinct in terms of mineralogy and alteration style, and display some key differences in mineral chemistry. Ilmenite grains from both PK346 and PK150 plot firmly in the kimberlite field defined by Wyatt et al. (2004) and have complete overlap. Conversely, groundmass phlogopite analyses from PK150 plot firmly along the kimberlite trend while PK346 follows the orangeite trend (Mitchell, 1995).

References

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