Vancouver Kimberlite Cluster

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Dear Vancouver Kimberlite Cluster,

Please join us on Tuesday Feb 28th at 6:00 pm at UBC Robson Square where we will hear from Matt Gaudet from Stornoway Diamond Corporation on the Renard 65 kimberlite pipe. Please see attached abstract for details.

After the talk, we invite all guests to join us for a drink and discussion at 7:00 pm at the Lennox Pub on 800 Granville St.

The Principal Role of Silicic Crustal Xenolith Assimilation in the Formation of Kimberley-type Pyroclastic Kimberlites

Feb 28th @ 6:00 pm – UBC Robson Square Rm C400, 800 Robson Street

***Matt Gaudet, M.Sc.**, Stornoway Diamond Corporation*

Our detailed petrographic studies of pipe-infilling pyroclastic kimberlite at the Renard 65 kimberlite pipe, Quebec, Canada, provide insightful new evidence on the role of silicic crustal xenolith assimilation in the formation of Kimberly-type pyroclastic kimberlite (KPK) rock types. The results from our extensive petrographic characterization of 700 m of drill core from four separate drill hole intersections in the Renard 65 pipe suggests that the pyroclastic KPK textures and the interclast matrix mineralogy are a result of hybridization of the kimberlite magma due to reactions with granitic and gneissic crustal xenoliths. The reactions demonstrate that the assimilation of crustal xenoliths and contamination of the kimberlite magmas primarily by Si result in the enhanced degassing of magmatic volatiles during emplacement, and stabilization of the hybrid interclast matrix microlitic assemblage diopside + phlogopite + serpentine over the non-hybrid assemblage calcite + phlogopite + serpentine. At subsolidus temperatures, the formation of metasomatic coronas on crustal xenoliths may record evidence of deuteric olivine serpentinization and subsolidus compositional modification of groundmass spinel.

The formation of KPK rock types in Renard 65 and associated rock types with textures intermediate between coherent and pyroclastic reflect the spatial distribution of silicic crustal xenoliths within the magma during emplacement and crystallization. Strong correlations are observed between crustal xenolith modes and kimberlite rock textures for other KPK pipes reported from Gahcho Kué and Renard. These results may further indicate that the different mineralogy and textures of Fort à la Corne-type and Kimberley-type pyroclastic kimberlites may be significantly influenced by the extent of assimilation of silicic crustal xenoliths driving the behavior of the kimberlite magma and exsolved magmatic volatiles during emplacement.