

Vita

Candidate's name: Taylor Arthur Ducharme

Universities

Attended: University of Ottawa (2018)
Bachelors of Science
Earth Science

University of New Brunswick (2020)
Masters of Science
Earth Science

Presentations:

Ducharme, T.A., van Rooyen, D., McFarlane, C., Corrigan, D., 2020. Spatio-temporal controls on the transition from AMCG-type magmatism to silicic peralkaline magmatism in the Nain Batholith. Oral Presentation at Atlantic Geoscience Society Colloquium, Truro, NS, February 7-8.

Ducharme, T.A., van Rooyen, D., McFarlane, C., Corrigan, D., 2019. Evaluating the late tectonothermal history of anorthosite massifs: evidence from the Flowers River Igneous Suite. Oral Presentation at GAC-MAC-IAH 2019, Quebec, QC, May 12-15.

Ducharme, T.A., van Rooyen, D., McFarlane, C., Corrigan, D., 2019. Mineralogical controls on rare metal enrichment in the Flowers River Igneous Suite, Nain Province, Labrador. Poster at Atlantic Geoscience Society Colloquium, Fredericton, NB, February 8-9.

Ducharme, T.A., Schneider, D.A., Coleman, M.J., 2018. Microstructural and SEM-CL analysis of deformed Archean quartz veins. Oral Presentation at Advances in Earth Science Research Conference 2018, Ottawa, ON, March 23-25.

Ducharme, T. A., Schneider, D. A., Coleman, M. J. 2018. Resolving episodes of deformation and hydrothermal quartz precipitation in the Amalgamated Break fault, Abitibi Subprovince, Ontario from microstructural and SEM-CL analyses. Poster at Atlantic Geoscience Society Colloquium, Truro, NS, February 2-3.

Petrogenesis, emplacement setting and magmatic-hydrothermal mineralization of the peralkaline Flowers River Igneous Suite, Hopedale Block, Labrador

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Taylor Arthur Ducharme

in the Department of Earth Science

U.N.B., Fredericton, N.B.

Wednesday, May 27th, 2020

11:00 a.m.

Via TEAMS

Examining Committee

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Dr. Deanne van Rooyen

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Abstract

The peralkaline Flowers River Igneous Suite intrudes the southernmost region of the Mesoproterozoic Nain Plutonic Suite composite batholith in north-central Labrador. The Flowers River complex comprises a voluminous series of peralkaline granite ring intrusions and their coeval volcanic assemblage, the latter of which has been identified as a target for rare metal exploration. Peralkaline igneous complexes throughout Labrador show a ubiquitous spatial association with earlier AMCG-affinity plutonism, suggesting the geodynamic conditions responsible for generating the latter may have systematically conditioned those sites to subsequently produce highly evolved, incompatible element-enriched magmas. This thesis uses LA ICP-MS U-Pb zircon geochronology to define a high-resolution magmatic and hydrothermal timeline for the Flowers River complex and its host suites. The Flowers River Granite intruded the local Nain Plutonic Suite rocks after ca. 8 Myr of quiescence, though trace element compositions indicate

these rocks share a common, incompatible element-enriched source. Protracted fractionation of the liquids derived from this source gave rise to two contrasting styles of magmatic-hydrothermal (Zr-Nb-Y-)REE mineralization, both hosted by the cogenetic volcanic rocks overlying the plutonic complex.