

# SEG 2024 Conference: Sustainable Mineral Exploration and Development

---

## Mineralogy and Petrology of the Petalite-Subtype Prof Pegmatite, Revelstoke, British Columbia, Canada

Catriona M. Breasley<sup>1</sup>, Lee A. Groat<sup>1</sup>, Tania Martins<sup>2</sup>, Robert L. Linnen<sup>3</sup>, Kyle P. Larson<sup>4</sup>, Rhiana E. Henry<sup>5</sup>  
1. University of British Columbia, Vancouver, BC, Canada, 2. Manitoba Geological Survey, Winnipeg, MB, Canada, 3. University of Western Ontario, London, ON, Canada, 4. University of British Columbia Okanagan, Kelowna, BC, Canada, 5. Gemological Institute of America, Carlsbad, CA, USA

The Prof pegmatite is exposed as a ~70- × 5-m dike located NW of Revelstoke, British Columbia, Canada on Boulder Mountain. Due to the abundance of petalite within it, the pegmatite is classified as a petalite subtype Li-Cs-Ta pegmatite or a group one pegmatite. The Prof pegmatite contains a suite of minerals indicative of a highly evolved pegmatitic melt including petalite, elbaite, lepidolite, and Nb-Ta oxides. It can be divided into four textural zones: (1) border, (2) intermediate, including (2.1) graphic texture dominant and (2.2) overgrowth dominant, where multiple minerals form rims around one another, (3) central, and (4) a quartz core. The border zone has a similar mineralogy to the intermediate zone and is interpreted to represent a chilled margin. The intermediate zone has a feldspar, mica, garnet, and dravite-schorl-dominant composition. The central zone hosts an evolved pegmatite core, which contains the main lithium mineralisation composed of petalite, elbaite, and lepidolite. The tourmalines, Nb-Ta oxides, and micas within the pegmatite record the geochemical evolution of the melt from more primitive Fe- and Mg-rich minerals to an Li-, Mn-, and Nb-rich assemblage indicative of an evolved geochemical system. The textures and geochemical composition of the pegmatite indicate that the melt was undercooled, highly geochemically evolved, and crystallised rapidly. Three phases of metasomatism are recognised in the Prof pegmatite: an albitization event, an Na-Li-F-rich event, and a sericitization event.

The Prof pegmatite has a similar mineralogy to known pegmatites on Mount Begbie, 15 km to the S, in particular the notable presence of the rare mineral qitianlingite, minor petalite, lepidolite, and elbaite. Together, these pegmatite bodies form part of an extensive, poorly mapped pegmatite field. Additional work is required to assess the extent and nature of mineralisation within this field.