

## **A Sulfide Lag? Mechanism of formation stratabound Ni Mo mineralization**

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This study aims to determine the genesis of a thin (2-12cm) laterally continuous (hundred of kilometers) nickel-molybdenum-PGE deposit located in the Selwyn Basin, Yukon, Canada. Models for this type of deposit include hydrothermal SEDEX and direct precipitation of seawater though these models are considered controversial. No known source has been identified in this region for the hydrothermal fluids which is expected of a SEDEX model, and extreme enrichment of metals in the seawater would be required for the direct precipitation model. In this study a sulfide-rich sedimentary lag origin, analogous to those found in New York in the Leicester Pyrite Member, is proposed.

This has been investigated using methods proposed in Formolo et al. (2007) which includes micro-drilling of pyrite to determine sulfur isotope variation within the clasts as well as SEM based identification of gangue minerals. A wide variation in S-isotopes adds evidence that the lag hypothesis by suggesting the mineralization had multiple lithological sources. Additionally, the gangue minerals in a lag deposit are expected to be denser in a lag deposit than a SEDEX or a precipitate deposit.

This study, through the proposition and testing of a new genetic model, aims to better understand the development of these types of ore deposits. This is essential to exploration geology as the genetic system can be used to pinpoint mineralized targets which otherwise can be overlooked, especially if they do not outcrop. Further work proposes to apply this methodology to similar mineralized deposits in China to better refine the genetic model and benefit global mineral exploration.