Improving geomet understanding in a mature operating paradigm

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Teck Resources Limited's (Teck) Highland Valley Copper (HVC) operation is located in southern British Columbia, approximately 50 km southwest of Kamloops, and 200 km northeast of Vancouver. HVC comprises multiple porphyry Cu-Mo centres, hosted by intrusive rocks of the Guichon Batholith. Mining in the HVC district began in the Bethlehem area in the 1960's and production currently comes from three open pits (Valley, Lornex and Highmont). The processing plant runs on a blended feed and has the capacity to process up to 145,000 tonnes of ore per day, depending on ore hardness (Teck AIF, February 2019). It uses autogenous and semi-autogenous grinding and flotation to produce copper and molybdenum concentrates.

HVC is committed to improving operational efficiency (from drilling, blasting, loading, hauling and milling) through a continued focus on orebody knowledge and innovative geoscience. In this presentation, we discuss how integrated applied Geoscience can facilitate improved geometallurgical understanding to deliver innovative solutions and drive change in a mature operating environment. These improvements require strong collaboration across the operational disciplines and are built on a foundation of high quality, contemporary geoscience and engineering data.

At HVC, in addition to leveraging decades of historical knowledge, mining and mineral processing data, introduction of modern geoscience datasets (e.g. hyperspectral core imaging), workflows (e.g. data driven logging) and data integration approaches (e.g. processing simulations) supported development of updated geological and geometallurgical models to assess specific value drivers. For example, both mill throughput and metal recoveries were targeted through integration of improved spatial geoscience models with validated spatially referenced metallurgical and operational data to better inform long-term ore hardness, mill throughput and ore quality and subsequent copper recovery predictions.

Understanding opportunity, assessing value and achieving change in an operating environment require much more than new data and updated models; strong collaboration across technical disciplines and operational areas are critical success factors. As part of a focus on operational efficiency and innovation, Teck has built an integrated, cross-disciplinary and cross-functional technical team to lead improvements in applied ore body knowledge at HVC. This team comprises subject matter experts across the mining value chain including geological characterization, mine planning, metallurgy and mill optimization. They are tasked with providing timely and accurate information to support good decision-making and define, evaluate and execute technologies with the exciting vision of transforming the way HVC defines, attributes value to and extracts future mining blocks.