

ABSTRACT

“The Legacy Potash Solution Mine Project: Advantages and Challenges from Exploration to Operation”

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The presentation will cover the development to-date and development plans for Potash One's Legacy Solution Mine project in Southern Saskatchewan in three domains: Geology and Geological Setting, Solution Mining and Processing.

Geology:

Saskatchewan is underlain by a vast deposit of evaporite minerals of Middle Devonian age, including the economically valuable fertilizer mineral sylvite (KCl). The beds are generally flat-lying, mineralogically simple, and of high grade, leading to economic exploitation by either underground mining methods or by solution mining methods. The key constraint in determining mining method is depth of burial – underground mining is not considered feasible if the deposit is deeper than some 1100m below surface. At greater depths solution mining is the only applicable technique, and even in this circumstance, it is generally regarded that the deposit should be hotter than 50 degrees C and/or deeper than 1,450m burial depth for solution mining to be effective and economically efficient. As will be shown in the presentation, much more of the potential Saskatchewan potash deposit is amenable to solution mining than to conventional underground mining.

Solution Mining:

Focusing on current solution mining industry best practices, the presentation will review key design and operational considerations of the mining method and compare and contrast these as much as practical to conventional underground mining techniques. In the end, the overall economics of a mining method will determine its applicability and solution mining will be compared to conventional underground mining this this key aspect.

Processing:

Processing of the brine feed from solution mining presents specific challenges as compared to conventional concentrators. Selection of the specific processing technologies will be reviewed and contrasted against conventional flotation plants. Key aspects are initial capital costs, scalability, maintainability and operating effectiveness, as well as overall economics. The processing discussion will take a broad view of the operation and include aspects around tailings, co-products and value-added products.