

## **ABSTRACT**

Mine mechanisation seems to be failing in the Bushveld Complex (BC) although it has been promoted on the basis of superior qualities to the conventional mining methods. This is particularly true for the extra low profile (XLP) mining method. The reasons for the successes and failures were observed from case studies and previous work captured through a comprehensive literature review. Interaction with industry experts and mine operators provided further insight into the suitability of mechanised mining systems on the BC.

Technology trials on the BC included non blasting mining methods in the form of cutting discs which were not successful but provided encouraging data for future development. The low profile (LP) and extra low profile (XLP) mining technology is the only tried technology that has formed part of the mining mix in the BC albeit with challenges. In some operations where mine mechanisation technology was tried the performance was poor resulting in discontinuation, conversion to hybrid mining method and/ or reverting to the conventional mining method.

Dilution makes the XLP and LP mining unsuitable for mining narrow tabular ore bodies due to the amount of waste that dilutes the ultimate grade of the mine. The technology that is suitable for mining mechanised equipment must be able to ensure that it does so safely and without compromising the value in terms of grade.

The current mining methods utilising mechanised equipment found in the BC has resulted in lower grades because of dilution caused by large excavations which are required to accommodate the equipment.

It is imperative to understand the impacts on value the mining method creates and/or destroys for the Life of mine. There are other mining methods which must be further investigated. These include non-blasting and long hole stoping mining methods, both have the same attributes of safety and high grade. Both systems remove persons from dangerous working areas and mining is concentrated on the mining channel width resulting in higher grades. Higher grade contributes to ultimate value of the mine.

