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Consideration of the criteria required for the selection of potential underground coal gasification sites in South Africa.

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Abstract

Underground coal gasification (UCG) is believed to be one of the cleaner coal exploiting technologies for energy generation. In this study UCG is assessed as a technology for unlocking coal seams that are too deeply buried underground for extraction and those which are enclosed by complex geological settings making it impossible to extract using conventional mining methods. The assessment of the UCG technique was based on a desktop study from previous UCG trials globally. The objective of this study was mainly focused on considering factors which could be useful in the selection of potential UCG sites in South Africa. It was noted that the coal geology, coal properties, geological and geotechnical condition are crucial parameters to consider when selecting a UCG site. Three boreholes from the Highveld coalfield were used for the subsurface evaluation by means of geophysical wireline logging. Five coal samples from these borehole cores were studied using different characterisation techniques to understand the nature of coal and determine the coal properties suitable for UCG. The information acquired by wireline logging gave an insight into the geological and geotechnical condition of the area, and the properties of coal determined show some degree of suitability for UCG process in terms of their physical and chemical composition.