

https://dspace.org/

Monitoring and management of a large open pit failure

Wessels, Stephanus David Naude

2010-09-13
http://hdl.handle.net/10539/8657

Downloaded from a DSpace repository. https://dspace.org/

ABSTRACT

A large scale slope instability developed at an operating mine over two years, resulting in a 4.5 million tonne collapse in July 2004.

During this period the Geotechnical personnel monitored and inspected the slope to ensure that the safety of personnel and equipment was not compromised. Monitoring of the slopes was done using visual inspections, conventional survey methods and the use of the Slope Stability Radar. The details of the observations and the monitoring results are described in this project, as well as the methods used to try to predict the onset of failure. The Slope Strain method of predicting failure is evaluated.

An important part of the management of a failure is the control measures that are put in place. The control measures, and how they are escalated in reaction to an increasing risk, are discussed.

Certain trigger levels were put in place. Due to location of mining at time of collapse the evacuation of personnel based on the trigger levels was not required. The effectiveness of the different trigger levels is evaluated.

All slope deformation and slope failures behave differently. When no site specific historical data is available, the geotechnical practitioner relies on available literature to formulate guidelines and threshold levels for the monitoring, prediction of failure, and safe management of unstable slopes. The detailed case study described in this report is considered to be a valuable contribution to the literature in these fields. The data contained in the report have been presented in detail since they may be of value to other researchers and practitioners in the rock slope field.