



**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**FACULTY OF ENGINEERING**

**Bachelor of Science in Mining Engineering**

**FINAL YEAR PROJECT REPORT ABOUT**

**DETERMINATION OF A SUITABLE MINING METHOD FOR**

**KANYOMERA GOLD DEPOSIT**

**By**

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*This final year Project Report is submitted to the Faculty of Engineering in Partial Fulfillment for the Award of a Bachelors of Science in Mining Engineering Degree of Busitema University*

May 2016

**Declaration**

I Nkuubi Patrick, a student of Busitema University under the department of Mining and Water Resources Engineering, hereby declare that this report, which portrays the details of my final year project, is of my own making, and that I have never used it anywhere or applied it in any other higher Institution.

Date: 1<sup>st</sup> June 2016

Signature: Patrick



**Approval**

This report has been handed in for examination with the approval of the following

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### **Acknowledgement**

First I thank God who made all this possible, despite the challenges that laid therein. I am so much grateful to my Parents who have struggled tooth and nail, both socially and financially to see me attain a good education. The government of the Republic of Uganda, my sponsors who have financed my stay at campus, I am so pleased to say thank you, and more critically, all tax payers. The administration of Busitema University, most specifically the Department of Mining and Water Resources Engineering more so my supervisor who worked tirelessly while guiding me throughout the project process and was so concerned in directing this project. I can never forget my fellow students; you are a great crowd to hang around, both academically and socially. Keep the spirit.

**Dedication**

I dedicate this work to my beloved parents, Mr. and Mrs. Mukiibi Moses, Dr. Jennifer Hinton and Mr. Sasiirwe Jonnie. You've all played a great role towards my carrier development.

*May the Almighty lord reward you abundantly!*

## **ABSTRACT**

Kanyomera gold deposit is one of the few orogenic gold deposits in which artisanal and small scale miners practice gold mining. However, due to limited knowledge and use of rudimentary mining methods and equipment, many lives have been lost and the environment has been severely degraded.

This research thesis aimed at determining a suitable mining method that can be used to exploit the deposit safely, productively and sustainably.

According to the study of the geology of the deposit, the ore body was found to be irregularly shaped, having an area of 2438m<sup>2</sup> and a thickness of 44.3m and steeply dipping at an angle of 55.4°. The ore body has a moderately high grade of 3.83 g/ton. This grade makes the ore body profitable enough to mine using surface mining method.

The geotechnical conditions of the deposit as obtained in relation to the rock mass rating used by Bieniawski in his classification scheme of the rock in 1989, showed that rock is fairly strong but can unfavorably be mined by underground mining methods, lest very expensive supports shall need to be used.

The economic evaluation of the deposit displayed a tonnage of 74,446 tones of ore and grade of 3.83 g/tons worth mining profitably, and a comparison of the surface and underground mining methods showed that the capital costs of surface mining by open pit were slightly higher than those for underground mining methods, though the operating costs of underground mining methods are much higher than those for surface mining methods. This implies that in the long run, surface mining method will be more cheaply compared to underground mining.

A suitable mining method was not attained due to the lack of drill hole data about the deposit to be used to analytically understand the deposit. There fore the mining company to extract this deposit should embark on a detailed exploration programme.

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## **INTRODUCTION**

### ***1.1. BACKGROUND***

Kanyomera gold deposit is located within Kitumbi- Kayonza gold field situated in Mubende gold district lying in the Paleoproterozoic fold belt traversing the Singo granite in the Buganda- Toro ranges. This puts the deposit in a shear zone where almost all the country rocks have been altered, weakened and mineralized by microscopic mineral grains due to the high pressure hydrothermal fluid emplacement.

However, both microscopic and macroscopic mineralization occurs in mineralized quartz veins which originate visibly from the surface in various dimensions.

The most abundant mineral in this area is haematite, although there are considerable concentrations of magnetite, tenantite, tourmaline, gold and traces of silver. (Mac Gregory, 1946)

Alluvial gold mineralization is found both on hill slopes and down in the valleys attracting the attention of most artisanal and small scale miners. Some miners have set up small scale mines but due to limited knowledge, capacity and lack of proper tools to efficiently exploit the deposit, the results are; the usage of poor mining methods leading to loss of lives, low productivity, ore losses and a high rate of environmental degradation.

The above mentioned challenges induce the need to determine a suitable mining method that can be employed to exploit the deposit safely, with high productivity and one that can ensure sustainability.

In order to determine which mining method is feasible, there is to be an evaluation of the mining methods in relation to the characteristics of the deposit. The method(s) that best matches the deposit characteristics shall be the one(s) considered technically feasible and shall be recommended for use.

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