

**OPTIMIZATION OF SRI LANKAN UNDERGROUND
GRAPHITE MINING METHODS, FROM A VIEW
POINT OF ROCK MECHANICS AND COST**

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University of Moratuwa, Sri Lanka
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Degree of Master of Science

Department of Earth Resources Engineering

University of Moratuwa
Sri Lanka

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Thesis submitted in partial fulfilment of the requirements for the degree Master of
Science

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DECLARATION

“I declare that this is my own work and this research does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any University or other institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research of the Masters dissertation under our supervision.

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Eng. P. V. A. Hemalal

Date

ABSTRACT

This research includes the study of the mining method adopted at Bogala Graphite Mines and its suitability compared with other mining methods used in the mining industry. The mining method adopted in Bogala mines has been assessed through this study. It mainly focus on the rock mechanics and financial aspects with comparisons to the mining methods adhered by the Sri Lankan mining industry.

The major graphite occurrence discovered more than hundred years has produced highly valued the world over. In Sri Lanka, graphite mineralizations occur in the form of rich veins with steep dips in the South-Western sector of the island, the vast stretch of area which has been famous for graphite mining with thousands of pits in operation during the high demand of the first and second world wars.

Where an outcrop is encountered, a pit had been sunk and the steeply dipping vein had been followed to the depths. At Bogala mines, the adoption of Overhand Cut-and-Fill mining method is influenced by the steeply dipping vein environment with rock intercalations and high water inflows with less competent country rock.

Although cut-and-fill mining has been traditionally successful ensuring high recovery and safety, only limited studies has been carried out with an engineering input to evaluate this method.

With the use of literature and site visits to Bogala mines, the mining method used at Bogala mines, the underground environment and the other mining methods used in the mining industry both internationally and locally have been studied. In evaluating the most suitable mining method, workability, safety and ore dilution and recovery factors of different mining methods were considered and the most suitable method for Bogala mine was evaluated.

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LIST OF ABBREVIATIONS

BGLP	Bogala Graphite Lanka PLC
KGLL	Kahatagaha Graphite Lanka Ltd
SGPL	Sakura Graphite PVT Ltd
LRMM	Longitudinal Retreat Mining Method
ISRM	International Society for Rock Mechanics

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