

**ANALYSIS OF FILL FENCE DEFORMATION ON POURING ACTIVITIES  
AT UNDERGROUND KENCANA AT PT. NUSA HALMAHERA  
MINERALS NORTH HALMAHERA REGENCY,  
NORTH MALUKU PROVINCE**

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**ABSTRACT**

*The underhand cut and fill (UHCF) mining method applied to Underground Kencana at PT. Nusa Halmahera Minerals (NHM) requires material backfill. One of the main challenges in the backfill process at the pouring stage is the risk of failure of the fill fence which functions to withstand the pressure of the paste material (cement, tuff and water). Fill fence failure, such as deformation, can be caused by poor material quality, inappropriate design, and suboptimal construction processes. The aim of this research is to use the Ground Monitoring LiDar (GML) tool to monitor fill fence movement and analyze deformation before and after pouring activities, as well as provide stability recommendations based on company standards. Measurements were carried out quantitatively in 5 areas. The results show that GML can measure the fill fence area, shotcrete thickness, deformation, pressure, load, force and safety factor. The surface area in the 5 areas varies from 28,420 m<sup>2</sup> to 39,735 m<sup>2</sup>. Pressure ranges from 82,376 kPa to 99,479 kPa, while load ranges from 216,237 kN/m<sup>2</sup> to 630,695 kN/m<sup>2</sup>. Forces ranged from 2729.079 N to 3747.040 N, with an average shotcrete thickness of 0.117 mm to 0.192 mm. The measured deformation varies from 0.962 mm to 3.336 mm. Safety factors range from 2.36 to 2.85. The recommendation from this research is to use more optimal shotcrete according to the company's SOP, namely with a thickness of 150 mm (0.15 m), and the recommended volume for areas ranging from 4,263 m<sup>3</sup> to 5,960 m<sup>3</sup>.*

*Key words: Deformation, Fill fence, GML, Pouring, Underground Kencana, PT. NHM*