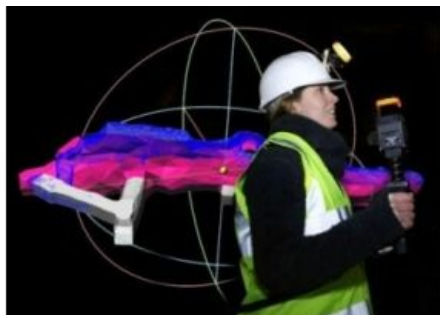


ZEB1 Handheld Laser Mapping at Historic South African Mine



A ZEB1 handheld laser mapping system is being used to map excavations at a gold mine in South Africa. Mining has been taking place at Barberton Mines in the Mpumalanga province since 1884 during which time mine managers have employed a range of surveying techniques and technologies. The latest innovation in surveying is allowing for 3D measurement of mined out excavations at depths of up to 1,450 metres. The ZEB1 has been purchased from 3D Laser Mapping.

Koos Verster, chief surveyor of Barberton Mines, stated he is very confident with the results they are getting using the ZEB1, combined with their own Mine Works GIS. They normally strive for 95 percent or higher accuracy but this combination is delivering 100 percent, not to mention the increase in productivity achieved. The ZEB1 is also

withstanding the difficult environment. It has been to some of the most extreme reaches of the mine, for prolonged periods of time, yet shows no undue effects, Verster added.

Previous working practices

Prior to the introduction of CAD in the early '90s, the historic Barberton Mine conducted the majority of stope survey work through offsetting with a 2D tabular deposit method. This did not highlight features such as folding, branching, thickening or thinning of mineralisation. Following the introduction of CAD in 1994 measurements were made using a hanging compass and clinometer. This method was far more accurate and enabled the production of 3D models but was, however, very time consuming.

The previous working practices had been in place for a long time, continued Verster, and they often had to make compromises between accuracy and survey time. All of these issues have been overcome since the company started working with the ZEB1.

Barberton Mine

The Barberton Mine is located 10 kilometres north east of the gold rush town of Barberton in the Mpumalanga province, 260 kilometres to the east of Johannesburg. The lode gold deposit is hosted in a volcanic and sedimentary sequence of the 3.5 billion year old Barberton Super Group. The extreme age and complex structural history of the ore body have resulted in a wide spectrum of lode shapes and dimensions. Various mining methods are employed due to variations in the deposit from the mine entrance level to depths of 1,450 metres, but the majority of tonnes mined are by semi-mechanised cut and fill.

Localisation and Mapping

Developed by CSIRO and commercialised by UK based 3D Laser Mapping, ZEB1 uses robotic technology called Simultaneous Localisation and Mapping (SLAM). The ZEB1 system includes a lightweight laser scanner mounted on a simple spring mechanism, which continuously scans as the operator walks through the environment. As the scanner loosely oscillates about the spring it produces a rotation that converts 2D laser measurements into 3D fields of view. Its ability to self-localise makes ZEB1 more than suited for use indoors, underground and in other covered environments, where traditional solutions that utilise GPS do not function well.