CASE STUDY:

Ernest Henry Copper Gold Mine

MAKING MINING SAFER

SUCCESSFUL MONITORING AND TARP*

"SSR™ is the preferred method for wall displacement monitoring at EHM, with proven effectiveness in mitigating risk associated with slope scale rock mass failure."

Peter Saunders, Geotechnical Superintendent, Xstrata's Ernest Henry Mine (EHM).

Owned by Xstrata PLC, Ernest Henry Copper Gold Mine is situated 131 Kilometres north east of Mount Isa. It is 1,500 metres in length by 1,200 metres wide with a final depth in excess of 500 metres. As the name suggests both copper and gold are produced here, with capacity of the mine at 11 mega tonnes per annum.

As a result of the aggressiveness of the original design of the mine, there is a high potential for planar, wedge and toppling failures. The mine structural domains, steep walls and two aquifers contribute to high pore pressures.

The primary concern of the site is safety. With 450 people employed on site there are a signficant number of both employees and contractors working in the pit. Considering the challenges of the pit, evacuations and interruptions to production are highly likely events. The Slope Stability Radar (SSR™) system monitors slope movements, thereby reducing unnecessary interruptions to production, to increase the efficiency of the mine and maximise revenue.

Ernest Henry Mine (EHM) has had an SSR System since May 2008 with immediate recognition of two main areas of concern. These areas have potential failure in tonnes of 1,000,000 and 400,000 respectively. With the recorded data they have implemented Targeted Action Response Plans (TARP) to deal with accelerated deformation detected by the SSR System.

The SSR System communicates to the Primary Monitoring Point through radio ELink via mesh network to the dispatch hut. As a 24hr operation it uses dispatch personnel for night shift monitoring.

In 2009 a 600,000 tonne rock collapse was successfully recorded and managed with the new TARP's. Personnel and equipment were evacuated before the failure and exclusion zones were demarcated. Continued monitoring meant mining was uninterrupted and TARP's were adjusted for post failure monitoring. There were some minor redesigns to 'mine off' the failure and since then similar geotechnical conditions have been detected prior to failure allowing accurate predictions for the future.

At the time EHM leased two SSR Systems, an SSR-X for longer distances at the top of the pit, used for continuous monitoring, and an SSR for shorter distances lower in the pit. The SSR is used as a back up for critical monitoring.

GroundProbe®

"As a company we feel privileged to have the safety reassurance of having SSRs scanning our primary activity areas."

Peter Saunders, Geotechnical Superintendent Xstrata's Ernest Henry Mine.

TWO RADARS ARE BETTER THAN ONE

EHM's own policies state SSR units are required for:-

- Monitoring of different stages of mining
- Rapid scanning of high risk areas (Hazard Management Approach)
- Broad area scanning of pit (Proactive Hazard Identification)

The SSR has become a permanent feature embedded in the body of the open cut pit, so much so that a dedicated concrete pad has been built for it, ensuring solid ground and stability for scanning.

Numerous small scale failures have been forecast, predicted, monitored and managed with the benefit of the SSR range and precision information and SSR analysis tools. In addition to the small scale failures, several large slope failures have occurred that the SSR's were monitoring. The SSR's provided the data and tools needed to coordinate a safe and efficient evacuation of personnel and equipment and also ensured that impacts to production were kept to an absolute minimum.

Slope instability management, safer working environments and advanced alarming tools have enabled Ernest Henry Mine to strengthen their 'No Harm' policy and manage risks better than ever before. Decisions to halt production and general mine activities are now calculated using information derived from the SSR.