



## Data collection and analysis synergy

A copper mine in Mexico benefits from the combined expertise of specialist consultants for laser scanning and geotechnical analysis.



Buenavista del Cobre is an open pit copper mine in Sonora, Mexico. The mine began operation in 1860 and is considered one of the biggest copper porphyry deposits in the world. In 1991, Buenavista del Cobre was acquired by Grupo México, the world's third largest copper producer.

SRK Consulting and Maptek™ worked together to meet the need for high-density scans that would quickly and accurately extract geological structures and faults for performing geotechnical analyses.

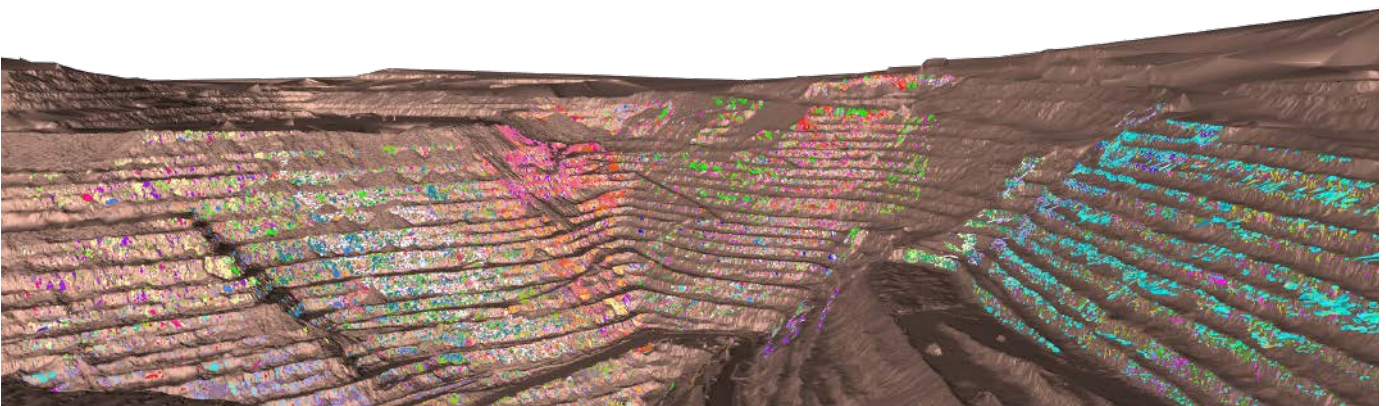
'The data collection and information processing service is of a high standard, reliable and efficient. Maptek not only provides us with the requested work, but also actively participates with our team to solve problems,' commented Fredy Henriquez of SRK Consulting.

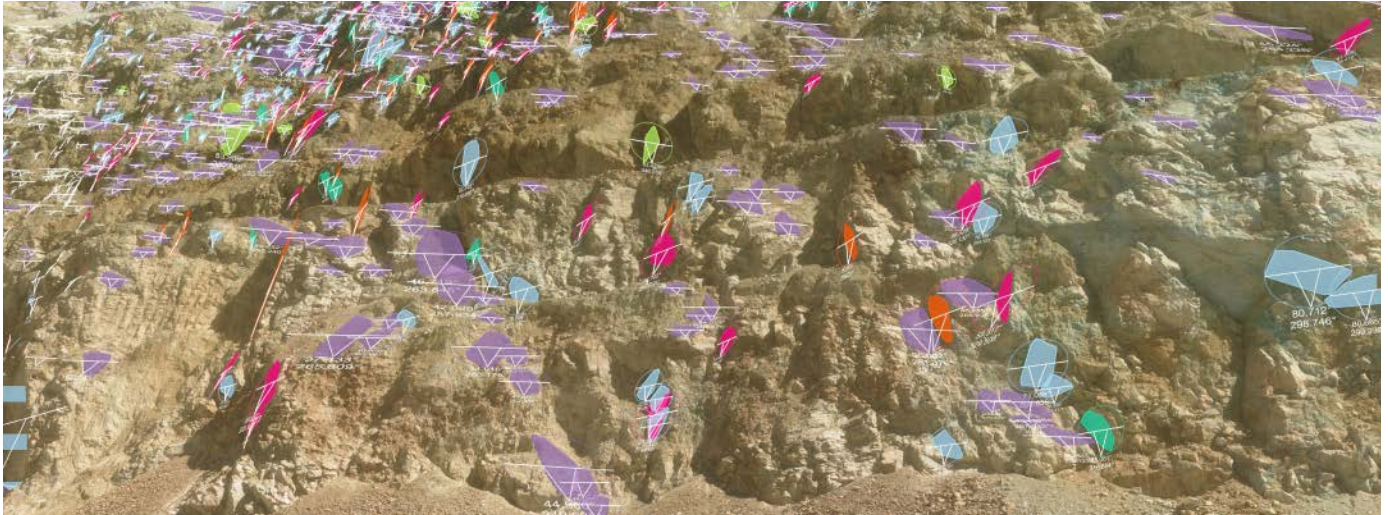
The speed and range of the Maptek XR3 laser scanners made it possible to obtain the necessary point cloud data. Using Maptek PointStudio™ software, extraction of structures and geotechnical analysis were carried out in minutes – this had seemed impossible in a single conventional process.

Buenavista de Cobre is one of the largest copper mines in the world, covering an area of 2.5km x 2.3km, with a depth greater than 500m. More than 800,000 tons of ore is moved daily, the equivalent of 40,000 dump truck trips.

The XR3 scanner captured 28 standard low resolution 360° scans with coordinates and 49 high-density scans, collecting a total of 390,292,902 points for geotechnical data processing.

PointStudio was used to process the data. Georeferencing of the low resolution scans was carried out with the Global tool, and the Copy Scan Registration tool was used for the high-density scans.





The georeferencing tools are very intuitive and easy to manipulate, needing only a basic configuration to operate. The pit was divided into several geotechnical zones, taking the azimuth of the slopes as a criterion. Predominant families of structures were extracted in each zone, with more than 85,000 discontinuities.

Discontinuities were extracted using Query, Smart Query and Extract tools. The fully automatic tool is the most intuitive, configuring minimum parameters to extract families of discontinuities with hundreds of structures. Finally, based on the families of discontinuities, Create Stereonet and Spacing tools were used to statistically ensure that the mapped structures are consistent.

The results were of excellent quality, and importantly, were acquired safely, as operators could avoid approaching slopes and the risk of encountering equipment or falling rock.

Another highlight is solving the challenge to visualise and extract structures on higher benches that are not accessible.

The work undertaken in the field and in the office was critical for the geotechnical analyses carried out jointly with SRK. It will be necessary to continue updating the information on the structures and families of discontinuities to maintain optimal slope stability information.

One improvement that SRK can rely on is a 5% increase in slope angles, meaning significant savings in production costs and underwriting plans for one of the largest mines in Mexico.

SRK recognises the valuable contribution of Maptek to their business. The professionalism of the Maptek team and the efficiency of delivering results leads to the reduction of project times and costs. Applying the information allows SRK to deliver reliable and optimised designs to clients, reducing the risk profile of projects.

SRK and Maptek Mexico will continue to collaborate on projects in Central America.

*Thanks to  
Freddy Henríquez  
Principal Consultant  
SRK Consulting US*