



Maximising limestone extraction

Maptek™ knowhow has helped a South African limestone operation produce a comprehensive reserves report in a timely manner.

In late 2021, Continental Resources (Pty) Ltd commissioned Maptek Southern Africa to conduct a reserves estimation study and compile a reserves report for a limestone deposit.

The 574 hectare study area is in the Limpopo Province, 100 km north-west of Pretoria. The landscape is relatively low lying with gently undulating topography.

The deposit strikes NE and the dip varies between 45° and 60° SE. The limestone occurs interbedded with shale, dolomite and chert.

The proposed project entails quarrying limestone over a surface area of approximately 120 ha on portions of the Krokodilkraal and adjacent farms as two separate open pits. The total indicated mineral resource calculated for the two blocks is 25 Mt, with an estimated life-of-mine of 30 years.

Open pit mining methods will use drill and blast, load, haul by truck and excavator. The quarried limestone will be processed by existing crushers before being transported to market.

Drillhole data from 231 holes, made up of collar, survey and assay data was used to compile a single block model of the entire resource area.

Grade estimation was conducted using Ordinary Kriging for all the grade variables. The block model was constrained by deleting blocks above the topographic surface and unsampled drillholes were flagged as waste and therefore excluded from the estimation.

The resource was classified as measured at 65 m radius and indicated at 130 m radius. The classification was further constrained using cut-off grades of $\text{CaO} > 38\%$, $\text{MgO} < 3.5\%$ and $\text{SiO}_2 < 10\%$. A bulk density value of 2.77 t/m³ was used to calculate the resource tonnages. No variation in bulk density by rock type was applied.

A practical mining depth of 130 m was used for this project, primarily to maximise extraction of the orebody and to serve as a mode of sampling to further understand and increase knowledge of the deeper lying deposit.

The pit shell was created using Maptek™ Vulcan™. Maptek started doing project work for Continental Resources in 2018, initially to review a feasibility study conducted by third-party consultants.

As the working relationship grew Maptek began to update the resource reserves annually.

Continental Resources prefers to use Maptek consulting services because of the timely delivery and accuracy of the results, which matched their internal audit checks.

'This project took two months to analyse and complete a summary report. The main challenge was a lack of geological data,' said Maptek Mine Planning Solutions Specialist, Brilliance Mabhena.

Indicator kriging and grade shelling were repeatedly trialled in an effort to create a more realistic orebody domain for block modelling and grade estimation. The effort resulted in a satisfactory reserves report.

The long-term working relationship with Continental Resources is a testimony to satisfaction with Maptek deliverables. The customer enjoys the continuous, interactive consultative environment.

Thanks to Continental Resources

