Optimising monthly resource estimations

An underground metals mine in Mexico improved estimation of mineral resources through implementation of Maptek™ Vulcan workflow tools.

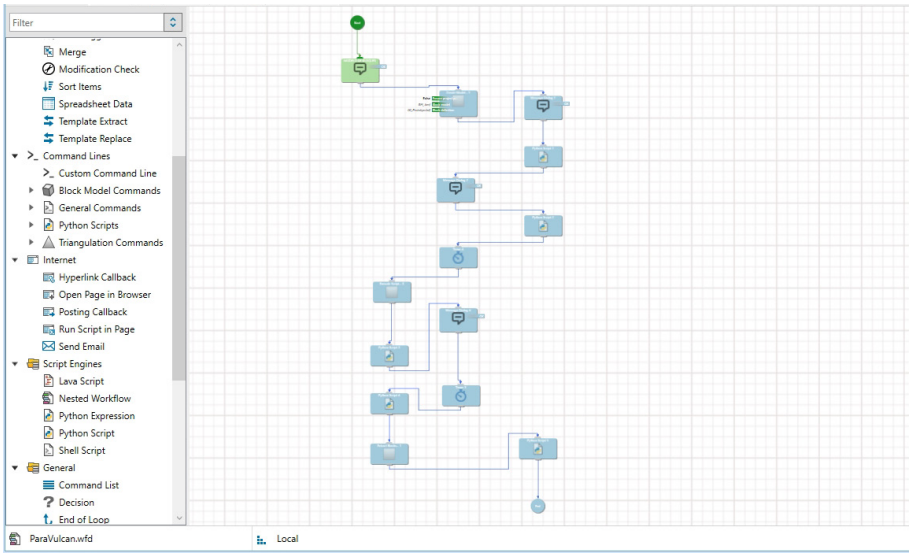
Cerro Los Gatos Mine is a mechanised underground operation about 120 km south of Chihuahua city in the Mexican silver belt. The Los Gatos District consists of 14 mineralised zones, with Cerro Los Gatos classed as an epithermal polymetallic deposit with low to intermediate sulphidation.

The Geology and Exploration team uses Maptek™ Vulcan™ for monthly resource estimation updates with information from channel and drillhole samples. The team seeks continuous improvement in optimising processes.

'Vulcan is very well suited for this important stage of the mining operation – the intuitive interface and versatile tools help us optimise all estimation processes for short and long-term modelling,' said José Antonio Mamani Vilca, Senior Mineral Resources Geologist.

Los Gatos has highly variable silver grades, very common in polymetallic deposits. The team strives to accurately define the mineralised zones, deploying Vulcan for exploratory data analysis of channel and drillhole samples from the start. This provides an overview perspective of the data.

> Monthly short-term updates are now automated using Workflows for Vulcan combined with Python scripting.



Implementing workflows and incorporating scripting using open source codes in the Pygeostat libraries has provided a greater understanding of channel sampling and drillhole data through univariate and multivariate analysis.

The Workflow Editor streamlines and reduces time for the estimation process. With the steps 'preset', only the new channel information is entered before the automation is run.

Current workflows comprise:

- Channel data import
- Block model definition generation
- Short-term model estimation
- Drillhole data import
- Long-term model estimation
- Mineral resources classification
- Hybrid model generation (channels+drillholes)

Each workflow provides control at every stage; the output is reviewed for quality control and once approved, the next workflow is run, until all seven are complete.

The automated approach is proving very effective, helping to shorten processing time for the volume of channel sampling data received. Based on this success, the team decided to integrate Python scripting through the Pygeostat libraries available to Vulcan users.

This enabled univariate and multivariate statistical analysis of all channel sampling and drillhole data, as well as generation of histograms, QQPLOT and PPLOT in seconds.

'It is important for resource geologists to generate statistical visuals at each stage of the resource estimation process to ensure good results,' Mamani said.

'We always look to innovate, and this successful implementation has shown we are on the right path.'

Resource estimates are reconciled monthly against extracted material. Power BI tools generate dashboards that allow Los Gatos to identify possible short or long-term deviations from the resource model.

The outcome of combining workflow tools with scripting and reducing processing time has been groundbreaking.

> The new approach has enabled significant time savings of 40%, justifying the vision of continuous improvement without sacrificing quality.

The ultimate benefit is maintaining control over quality and optimising the routines that estimation geologists use daily or monthly.

'This approach has expanded our expectations of the potential for resource estimation using scripting,' concluded Mamani.

Cerro Los Gatos is carrying out tests to implement Python SDK in Vulcan and will continue to explore various other options for future integration into their processes.

Thanks to
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