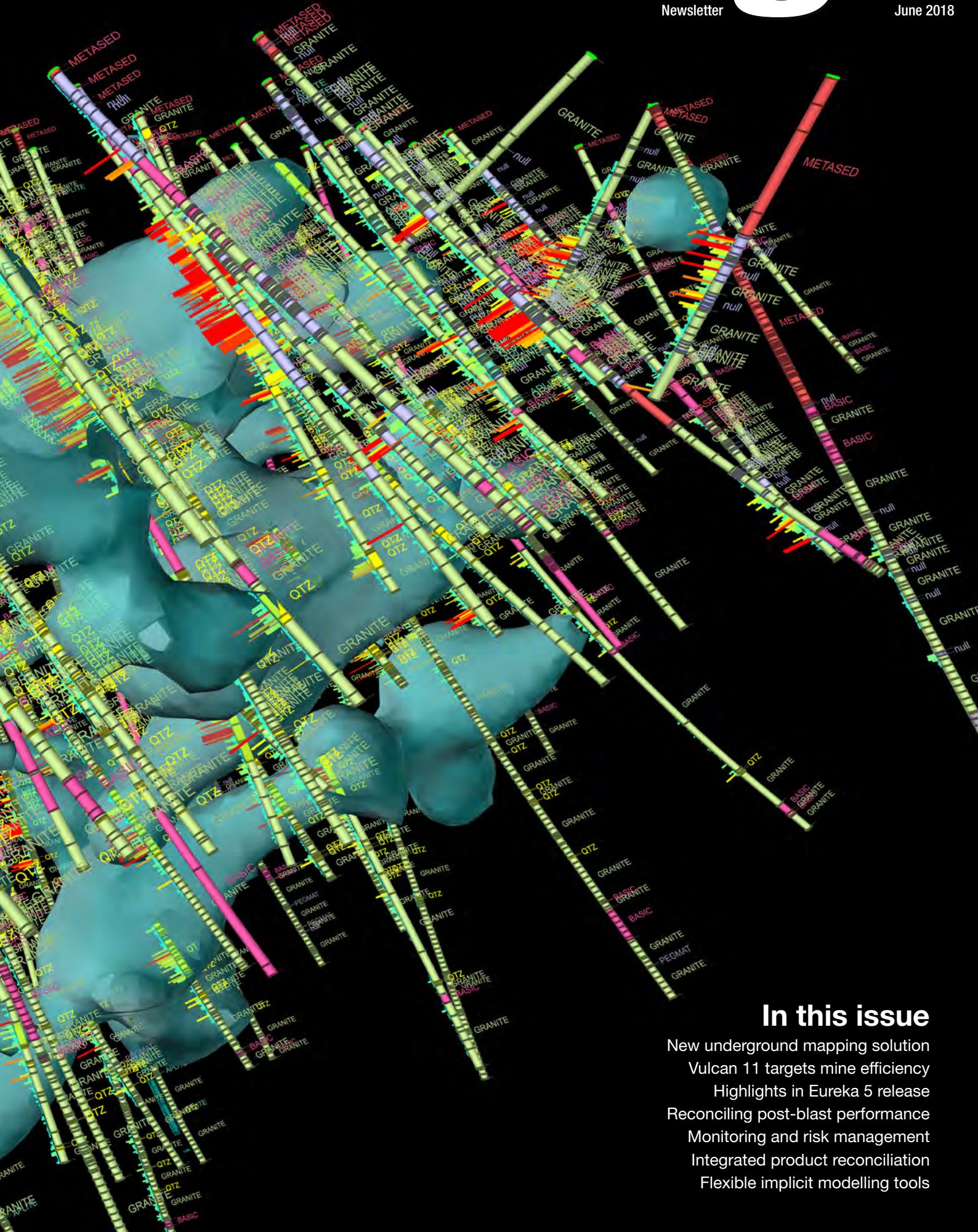
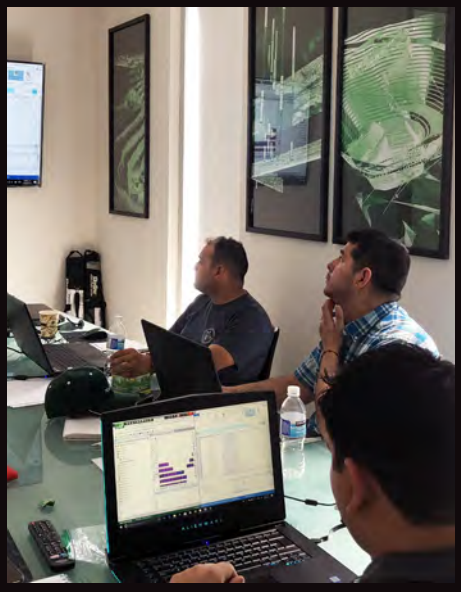
MAPTEK

Forge

Newsletter June 2018



In this issue



Efficient reconciliation

As the industry outlook continues to improve, production is ramping up to take advantage of higher demand. Operations have efficiency measures in their sights.

Efficiency gains go hand-in-hand with digital effectiveness only if appropriate technology is used for analysis. Operations must first collect data and benchmark existing system effectiveness to be able to identify where processes can be improved to make the most impact on performance.

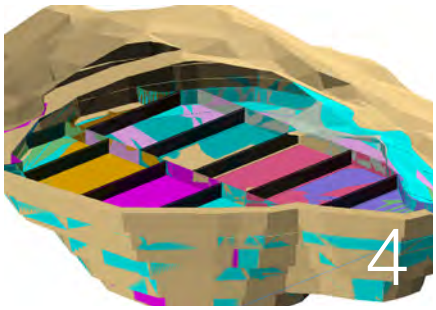
Delivering on that potential requires adoption of an integrated system approach, with technology designed and built from the ground up to target improved outcomes in mining-specific business performance metrics.

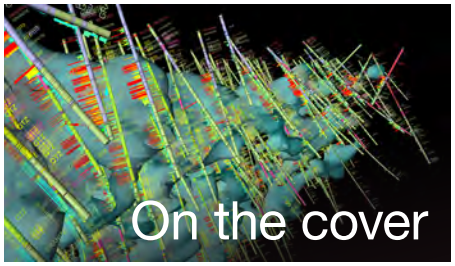
Metrics such as grade control and resource reconciliation, material tracking and stockpile management, design conformance on batter angles and bench widths can have significant impact on a mine's economic performance in the long term. They must be managed carefully.

With 40 years designing, implementing and supporting mining solutions, only Maptek can offer and deliver integrated systems. We welcome any mine to evaluate our solutions using their data and processes. We're confident Maptek will be the solution of choice. When mining companies choose Maptek they are making a decision to not risk the safety, productivity and profitability of their operations.

You can explore these themes in this issue and we welcome your feedback at forge@maptek.com

Peter Johnson
Managing Director



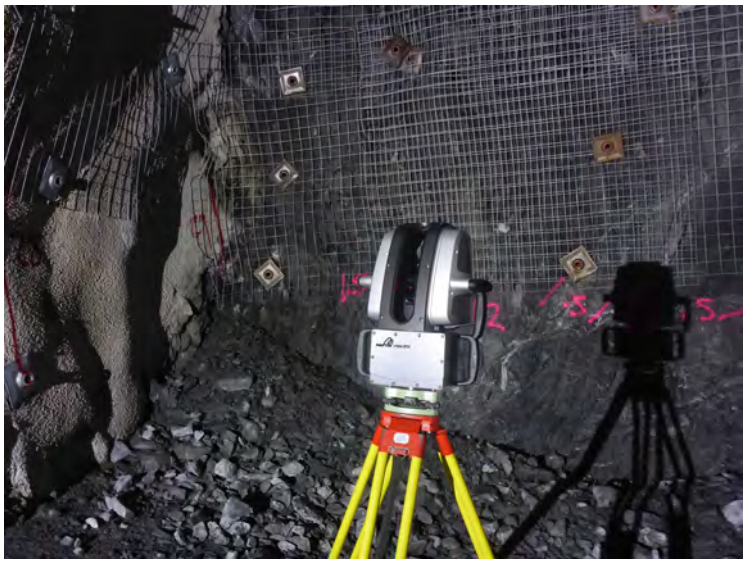


Maptek implicit modelling tools bring your project data to brilliant life

Contents

A single solution for underground mapping

The new Maptek™ SR3 laser scanner has been designed to effortlessly accomplish underground spatial mapping tasks.



Taking a Maptek™ third generation laser scanner underground is a totally satisfying experience. For a start, the Maptek™ SR3 weighs less than 10 kg, and can be easily carried by its ergonomic handle. Flexible mounting options include tripod, underground vehicle or extendable boom.

Efficiency

Setup and registration is a seamless exercise. Using multi-backsight to known targets ensures accurate scanner positioning. This enables users to easily view digitised CAD files and compare design strings to as-builts underground.

> The Maptek SR3 can capture a 360-degree scan in less than a minute.

Imagination becomes reality with fast, safe collection of accurate survey grade data underground, accompanied by intuitive tools that streamline geological mapping and detailed geotechnical analysis.

'Customers have reported a high level of satisfaction using the SR3,' said Product Manager James Howarth. 'One of the new features allows access to the user interface through any web-enabled device to conduct scans.'

Imagery

While the internal 147 megapixel HDR camera is optional, many operations will appreciate the benefits of acquiring high definition digital imagery and scan data simultaneously.

With the SR3 users can capture accurate digital imagery of unsupported ground in drives and development headings prior to treatment. The 3D point cloud and matching imagery can be used for geological and geotechnical applications with no extra time spent underground.

Overlaying imagery on high resolution point clouds allows enhanced recognition of structures, joints and boundaries.

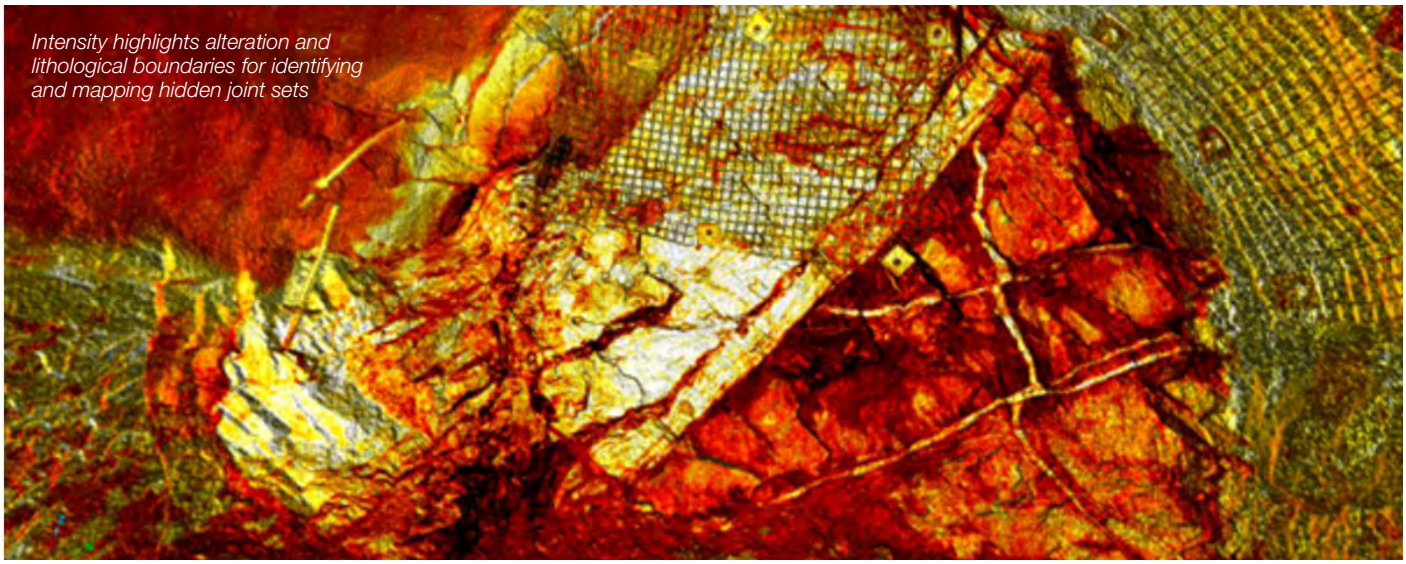
> One of the easiest ways to map geology is to switch between imagery and scan spectrum intensity.

'The SR3 significantly reduces the time and manual effort for geological mapping underground,' said Howarth. 'One customer reports that turnaround time on mapping has improved from 2 hours to 15 minutes.'

Detailed high resolution imagery is a key asset for geological and geotechnical applications, as well as useful for communicating with stakeholders.

A new feature allows import of mine CAD strings and surfaces for visualisation on scans. Users can also view grade shell boundaries and fault zones as surfaces alongside a scan to assist with identification of structures at the rock face.

'We spent a lot of time getting the tablet workflow as efficient as possible,' said Howarth.



Intensity highlights alteration and lithological boundaries for identifying and mapping hidden joint sets

'Geologists can load a scan, turn on the design layers and compare the design strings to as-builts while underground. This is a massive advantage over other systems.'

Processing/reporting

A wide scan window captures surfaces of underground drives without the need for complicated configurations. Whatever the orientation of the scanner, integrated levelling automatically corrects scans before processing.

The seamless experience continues on the reporting side. A soon-to-be-released Underground Reporting Module provides the workflow for easily comparing a design solid with an actual surveyed solid to identify overbreak and underbreak.

> Benefits include reducing grade dilution, highlighting unstable areas and reducing costs by identifying unnecessary development and pre-blast issues.

Whether you are a surveyor, geologist or rock engineer, the SR3 can smoothly handle your spatial mine measurement tasks underground.

One system. Multiple applications.

- Map entire underground operations in 3D
- Survey drives, stopes and tunnels
- Reconcile stockpile volumes
- Map geological faces
- Survey shotcrete and rock bolt installations
- Conduct geotechnical mapping and analysis
- Identify long term spalling rates and deformation
- Monitor underground surface stability

More information at www.maptek.com

Vulcan 11 release targets efficiency

New functionality and enhanced tools in Maptek™ Vulcan™ 11 target the productivity improvements and efficiency gains operations require as mining activity ramps up.

Maptek™ Vulcan™ 11 continues the trend of providing an increased number of automated functions and workflows. High impact visualisation, faster processing and better ways to work with large, complex datasets help users work even more efficiently.

In March we highlighted the tools coming for resource geology applications - data analyser and kriging neighbourhood analysis. This issue focuses on new options for engineers and mine planners, as well as performance improvements across a range of processes.

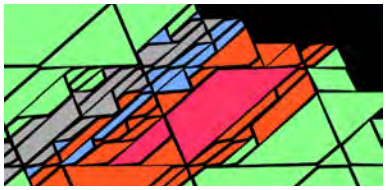
Maptek Workbench

The Maptek Workbench provides a unified platform for running Maptek applications. A new search menu option, which more easily locates favourite Vulcan tools, and animated tooltips displaying video tutorials on mouseover are notable updates.

The **Workflow Editor** allows users to build a command list for automating routine tasks, incorporating Vulcan menu items as well as common desktop tools.

Users can choose between list or diagram view, dragging and dropping nodes that represent each process. Configured components can be saved to build new workflows. Pauses and triggers for processes can be built in.

Text, scripting and spreadsheet editing applications can be incorporated into workflows. Variables can be queried and users can troubleshoot workflows.



Visualisation

Visualising multiple block variables dynamically in Vulcan 11 allows users to quickly assess all realisations of a simulation and set up animations to run through all equi-probable solutions.

New ellipsoid display dynamically updates the samples that will be selected for use in grade estimation as the ellipsoid boundary changes.

The strike, dip and plunge orientations and the search lengths along each ellipsoid axis can easily be manipulated on screen. This is a very powerful way for understanding the impact of estimations.

Graphics

Three new icons on the **Graphics toolbar** - Solid Slice, Quick Section, Tile and Tie - target niche tasks with big impact.

Users can easily generate slices from closed solids for a better view of data. Slices retain the colour of the parent triangulation, and transparency is optional. A slice can be created in either or both front and back ends of the section, or as a single slice in the middle.

The new Quick Section two-click operation requires input of two points to define a plane for slicing.

Tile and Tie allows users to view multiple windows simultaneously; moving data in one window shows the data from the same reference point in each window.

Grade control

New Grade Control features include dramatically increased speed for resolving samples, additional date formats and the ability to use Perl and Python scripts for grade estimation. Plotting output has been improved, bench plans can be saved, blast reporting panels re-sized and grade blocks edited by a drop-down pick list.

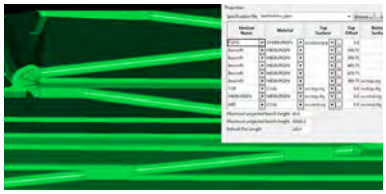
Grade control optimiser

Continually improved since release in 2017, the standalone Grade Control Optimiser module helps operations improve the value of deposits. The latest update includes improvements to the core optimisation engine which guarantees locally optimal results.

The tool also includes an option to apply different mining widths. Users can choose to populate the classification grid by reading the variables directly from the block model. The mineable optimisation area can be specified via an additional block selection, and the known upper bound is reported by the optimiser.

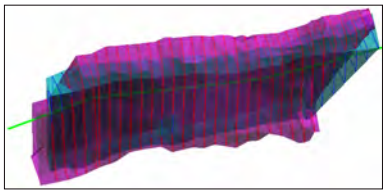
The time limit for the optimiser now applies to the entire problem, while recognising that the problem is split into multiple pieces.

Customers will be notified when Vulcan 11 is available for download.



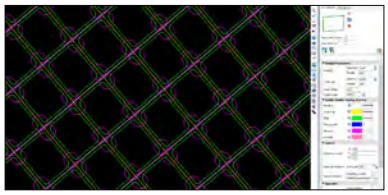
Highwall ramps

Engineers can now create highwall templates with improved flexibility in ramp design, including the ability to incorporate multiple ramps. Reserving is improved, with flow on to more accurate scheduling in Evolution. The upgrade supports dragline passes.



Overbreak/underbreak

Surveyors and engineers who need to frequently calculate overbreak and underbreak will welcome this new tool for comparing designs and as-builts. Clicking on each cross-section displays dimensions for as-built, design, overbreak and underbreak as well as percentage of deviation.

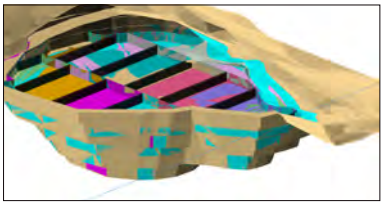


Panel caving design

New panel caving design functionality in Vulcan 11 will feed into Maptek's strategic CaveLogic application. The automated process for creating 3D CAD level production and sink level mining designs takes into account geometric, technical and operational parameters. Changes to pillar dimensions and orientations, drive widths and heights are automatically reflected in designs.

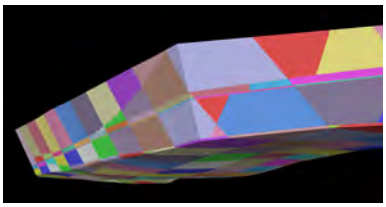
Pre-scheduling

Vulcan offers different approaches when generating mining blocks for scheduling. Mining Block Generation and Pit Splitter enhancements provide greater efficiency and improved mine planning–scheduling connectivity.



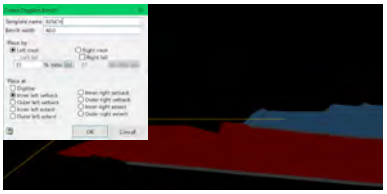
Mining Block Generation employs a simple, repeatable approach, which also maintains flexibility for updates when running calculations. Any accumulation variable, such as insitu metals or volume, can be selected and applied as a target. Dynamic adjustment of blocks allows simple, interactive solid and attribute modification on the fly.

Another improvement in the mine planning–scheduling interface allows users to populate Vulcan block models with the results from Maptek™ Evolution optimisation. This enables creation of end-of-period maps and animation of the scheduling phases.



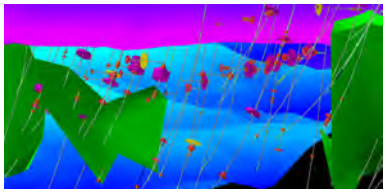
Pit Splitter provides a workflow-based approach to creating solids for strip mines, with reliable output applicable to all Maptek mine planning and scheduling workflows. In addition to exerting greater control over how pits are split, users can stipulate colours and devise formula-created attributes from generated attributes.

Improved options support amalgamated projection methods, projection on grids, stacking and splitting in any sequence.



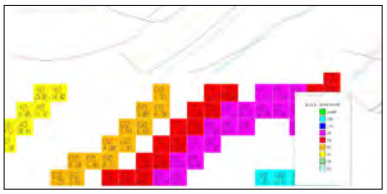
Dragline enhancements

Dragline functionality has been further enhanced to meet the goal of efficient, single menu workflows. This includes automated bench templates, the ability to follow floor undulations more closely when creating the maximum spoil profile, doze to RL and doze as flat as possible, and unlimited offset blocks for the spoil report.



3D geological sculpting

3D Geological Sculpting allows solids created through implicit modelling or other techniques to be modified using a freehand or snapping mode to sculpt, deform, pinch and smooth geological models on screen. Updates in Vulcan 11 allow incorporation of production data and samples databases. Search and filter algorithms now perform up to 40 times faster. Auditability has also improved.

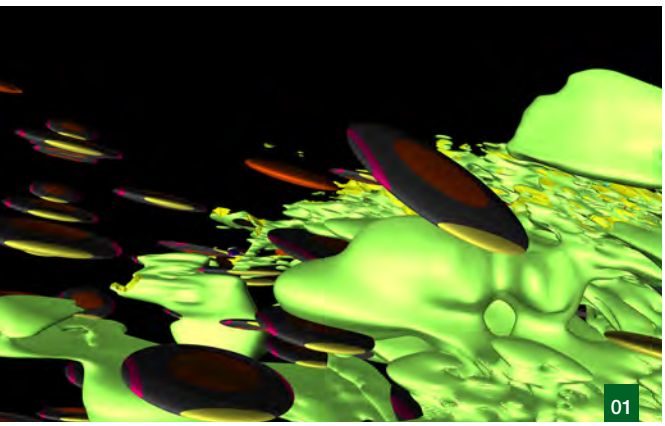


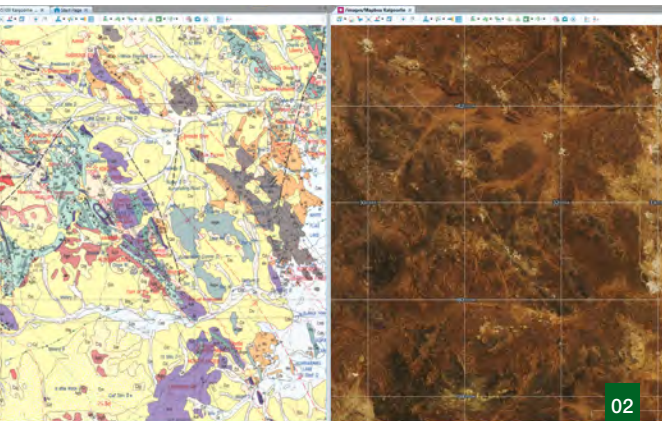
Python scripting

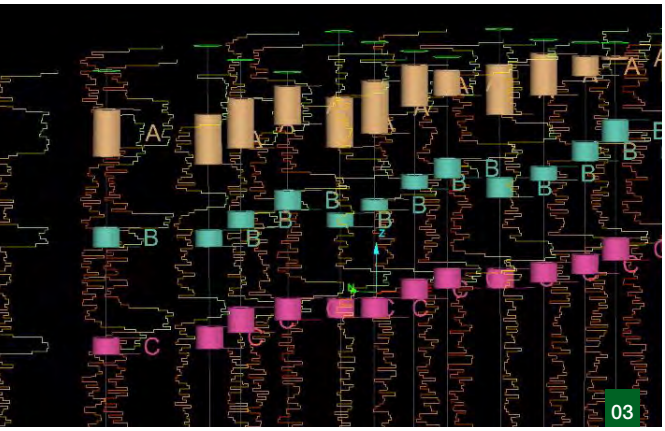
Python scripting helps customise solutions for working with large data arrays in block models, databases, mapfiles, grids and triangulations. This upgrade adds support for Envisage functionality, interactivity, and Vulcan data structures such as design data, drillholes and samples.

Integrated modelling with Eureka 5

Updates in Maptek™ Eureka 5 and the Maptek Workbench will deliver enhanced modelling, correlation and mapping tools.







01 Implicit modelling accepts a wide range of input data
02 Generate dynamic global or local maps with Mapbox
03 Seam labelling streamlines geological interpretation

Maptek™ Vulcan™ and Eureka users have been operating on the Maptek Workbench for a year, with positive feedback to date. Toolbars, menus, command lists and shortcut keys can be created to suit work patterns. Universal access to text and spreadsheet editors, database and scripting tools makes working with exploration and project data a better overall software experience.

Sharing the Maptek Workbench environment with Vulcan, and with other applications coming in 2018-2019, opens up integrated drillhole modelling and visualisation, tied and tiled views, and cross-product workflows.

> Drillhole data changed in one application is shared in the other applications.

Taking a function-based approach to **implicit modelling**, Eureka also allows a wide range of input data types including triangulations, attributed points, direct drillhole intercepts and line-based ribbons.

Multiple orientation ellipses can be used simultaneously to control models in structurally complex situations for enhanced orebody interpretation. This is ideal for elongate and variably sampled modelling, as well as modelling veins as hanging walls and footwalls.

A different methodology is tailored to modelling thin, steeply dipping vein-type deposits, whereby the hanging and footwall models are created as Radial Basis function surfaces rather than solids.

With Eureka 5, users can create implicit surfaces from categorical attributes on point data, for example, modelling rock codes. Multiple rock code attributes can then be modelled as a single surface.

Selecting values to model string attributes on drillholes or attributed points is simply done via displayed attribute legends. Colouring is automatically carried across to matching surfaces. A multi-threading option improves performance.

A single streamlined option allows users to create **dynamic global or local maps** using the Mapbox service, including automatic selection of appropriate coordinate systems and zooming in to selected objects.

Automatic seam labelling from downhole data makes it easier to assign seam names to coal units. A slider bar controls the number of seams generated, and the tool now works on selected edges of the drillhole to allow label refinement.

Eureka allows spatially located data to be put into context to better understand the inter-connecting relationships between disparate information. The latest tools enhance viewing and correlation of the data as well as in-depth analysis of areas of interest.

Customers will be notified early in the third quarter when Eureka 5 is available for download.

Reconciling post blast performance

Maptek™ BlastLogic™ addresses the difficult and time consuming process of reconciling field results back to design, allowing engineers to focus on blast improvement.

Reconciling field results back to design is difficult and time consuming. Maptek™ BlastLogic™ addresses this issue, and adds the ability to use those results to improve design and process.

Mines dealing with a burdensome reconciliation process risk entrenching poor blast practices.

BlastLogic provides a mechanism for mines to sustainably optimise blast safety, productivity and costs. Operational transparency is achieved through connecting data, and operational insights are delivered in near-real time.

For example, BlastLogic integrates with leading drill navigation systems, 'bringing to life' their measurement-while-drilling data to help validate ore grade and rock type boundaries. In connecting geology with this data, engineers optimise charge plans and initiation designs in BlastLogic for better fragmentation efficiency and finer vibration control.

How does drilling hardness and powder factor affect dig rates? Is water compromising hole integrity? What size distribution will optimise mill throughput?

By collecting and visualising real-time blasting information, BlastLogic allows mines to not only address these questions, but also adapt to production changes.

> Achieving 5% annual savings in drill and blast costs is possible for most mines.

The capability to collate and present field data is not enough. BlastLogic frees up engineering time by simplifying the process of design and reconciliation, so engineers can drive improvements in blast performance. Blast analytics that correlate and aggregate data allow trends to be tracked over time, with nuances highlighted.

BlastLogic is the industry's only truly integrated blast design and reconciliation solution. The different components (server, SQL database, desktop, tablet, integration service, custom reporting and licensing) have all been designed and built from the ground up as an integrated system, as opposed to combining separate software applications that are inherently difficult to integrate.

Implemented at scale by the world's leading miners, BlastLogic is relied on to support the most challenging blasting practices. Hosted centrally on the cloud or on-premise, BlastLogic simplifies and accelerates the process of creating and implementing advanced blast designs, while measuring and reporting on blast accuracy.

New to BlastLogic 2.1 Update 3, released in April 2018, is the flexibility to integrate key upstream and downstream metrics such as block model density, ore grade, dig rates, fragmentation, crusher or mill throughput.

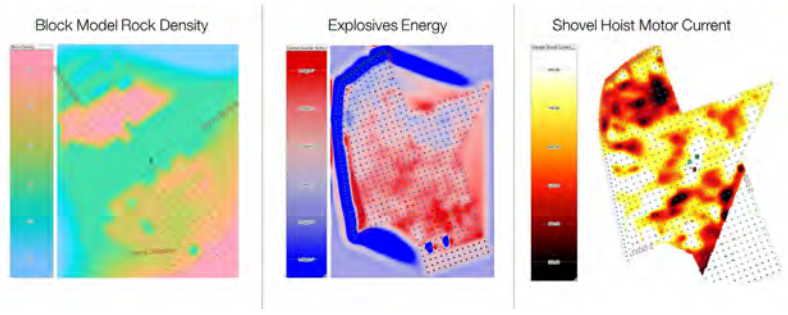
Integrating these data sources into BlastLogic will further help validate correlations. Information can be associated to the actual blasthole record and used for downstream evaluation of planned against actual. Heatmaps are generated at the hole or blast level using available field measurement data, matching the blast objective to the end result.

Vibration and Overpressure observation data can now be recorded in BlastLogic by monitoring location as well as the measured maximum instantaneous charge, peak particle velocity and decibels. These measurements are used to calibrate the site variables and exponents used in each model, and are filterable to different regions of the mine.

Integrating and analysing all critical blast information from geology, survey, drills, vibration, fragmentation, dig rates, crusher and mill feeds creates significant value by extracting intelligence and insights that can be meaningfully used to drive greater performance.

Reconciliation can be performed by blast, bench, pit or month to seize business opportunities.

BlastLogic provides data and process transparency to managers and other functional teams. Any stakeholder can now readily track blast performance indicators and proactively contribute to the drive for greater operational and economic improvement.



Monitoring and risk management

Maptek™ Sentry is an intuitive visualisation and monitoring analysis tool employing 3D laser scanning for better understanding of surface stability in mining environments.

Versatile. Accurate. Reliable.
Three words that aptly describe Maptek™ Sentry. This state-of-the-art monitoring system has quickly become the new standard for tracking surface movement and analysing slope stability.

Maptek has been developing terrestrial laser scanners for mine survey since 1999. Our hardware and software technology is highly regarded for streamlined setup, safe and accurate data acquisition and efficient data processing.

Maptek's expertise in laser scanning solutions has provided operations with fast and reliable topographic survey, stockpile volumes, end-of-month measurements and mine modelling.

While change detection has always been possible with our systems, the growing popularity of applications such as geotechnical mapping and stability monitoring as candidates for LiDAR technology motivated us to advance research and development in automated, continuous monitoring.

Prototyping and site trials proved that this approach would provide the required safety and accuracy for monitoring, as well as flexibility to enhance other mine survey tasks.

Sentry combines a Maptek laser scanner with sophisticated software to monitor, analyse and report on rapid and gradual movements that could interrupt operations.

True 3D spatial data ensures reliable tracking of movement over time. Sentry maps and monitors the entire scene, collecting a 3D digital terrain model. This allows potential failures to be viewed in the context of surrounding structures.

> When using a fixed bollard setup operators can interrupt a monitoring task and resume it later without losing the monitoring history.

Sentry can track rockfalls and similar events that are invisible to other methods. The high resolution point cloud data collected by the laser scanner can also be used for quantifying rockfall volumes, face mapping and geotechnical analysis.

Maptek terrestrial laser scanning systems are simple to set up and operate. Built-in application workflows, a 3D visualisation platform and reporting wizards contribute to overall site efficiency.

Operations can easily define monitoring frequency and alarm thresholds to meet strategic design and planning needs.

Multiple zones can be monitored within a scene, and accurate, timely reporting of movements helps operations mitigate risk.

Remote viewing of data improves site safety. The latest controller interface allows users to also log in to the system from any web-enabled device to conduct the monitoring process remotely.

Versatile

Sentry Patrol is highly effective for wide area monitoring because it can be rapidly deployed as a 'first aid' solution. Periodic monitoring with the Patrol system mounted on a tripod, wall or bollard allows large scenes to be quickly captured, helping to determine zones to watch more closely.

Continuous monitoring can then be used where conditions pose the greatest risk, providing real-time accurate data to guide safety management programs. Sentry can be run as a self-contained, mobile monitoring system with integrated power and communications that sustain 24/7 operation.

Maptek laser scanners are easily mobilised. They can be set up repeatably over the same location for fixed monitoring, or used in itinerant mode for wide area survey and monitoring.

Acquisition of high resolution 3D point cloud data provides a massive advantage over non-LiDAR methods – the same point cloud can be taken into Maptek™ I-Site™ Studio for mapping highwalls, active faces, geological structures, roads, ramps and infrastructure.

A true survey grade DTM is a by-product of the Sentry process and the highly accurate data is available for other applications.

Accurate

Accurate data matters where safety is concerned. Sentry is capable of detecting sub-millimetre trends, allowing operations to analyse the mechanics of wall failures with greater fidelity than other systems.

> Managers and geotechnical teams can rely on accurate Sentry output for assessing how to manage a site in the event of a failure.

The accurate survey grade data collected by the laser scanner can be used to record rockfalls, including points of origin and landing. Data can be exported to I-Site Studio for analysis and volume calculations.

Geotechnical teams can then update rockfall databases and mark out exclusion zones in the vicinity of highwall toes.

Sentry can monitor fast moving areas without the issues that occur due to phase ambiguity. It does this by measuring true 3D surfaces and comparing the difference between them. Changes can be viewed as a velocity graph or distance map.

Reliable

Rated to IP65 for environmental protection, Maptek 3D laser scanners are designed to operate continuously above or underground.

The sealed housing can withstand moist, hot, cold, dusty, damp and corrosive conditions, ensuring the continuous performance that operations must rely on for 24-7 monitoring.

In-built power sources mean lower operating costs. The Sentry system can be left to run autonomously once monitoring zones, alarm thresholds and reporting frequency have been established.

Maptek is using valuable feedback from Sentry sites to continuously improve the monitoring system.

Contact Maptek to learn more about the advantages of this laser-based approach to tracking surface movement, analysing slope stability and monitoring convergence.

Versatile. Accurate. Reliable.

- Remote, continuous operation
- Intuitive software user interface
- True 3D survey grade instrument able to produce a digital terrain model (DTM)
- Co-registered photographs and infrared image overlays
- Create displacement, velocity heatmaps
- Accurate comparison of cell-by-cell measurements
- Measure change after rapid movement
- Compare historical data
- Visualise event heatmap overlaid on image
- Access to experienced Maptek professional services

Integrated production reconciliation

MinLog developed a unique MineSuite configuration, providing a single system which integrates with third-party systems for accurate, timely grade reconciliation.

A well-known coal supplier in Australia uses one of the world's largest mining service providers for contract mining. The contract is based on production gains or losses when comparing geologically defined reconciliation areas against product delivered.

To optimise gains, the contractor decided to build a pre-treatment plant (PTP) to beneficiate material that would normally have been treated as waste. A means to measure the efficacy of the PTP was then needed.

The contractor recognised the value of a single system to integrate with third-party systems in order to provide accurate, timely grade reconciliation.

Gains and losses are calculated by referencing the geological block model used by the mine owner.

> The contractor's challenge is to determine deficiencies in their mining method or discrepancies in the geological block model.

The contractor uses a range of Maptek™ solutions, including Vulcan, BlastLogic, I-Site and Eureka to measure the exposed ore and determine mining competency.

A means of integrating the Maptek data with fleet management and client-owned coal handling processing plant (CHPP) information is required for accurate calculations. The contractor also wanted to determine gains due to the PTP. A MineSuite configuration achieved this objective.

MineSuite MineReconciler and PlantManager will allow geologists to integrate information from Maptek and other third-party systems. This information will be contextualised in the MineReconciler, allowing geologists to validate, correct and approve values emanating from the various source systems and associated with specific geological reconciliation areas.

MineSuite Reports will be used to view contractual results and identify specific opportunities for improvement. The effect of these improvements can then be measured and reported on.

Modelling processes

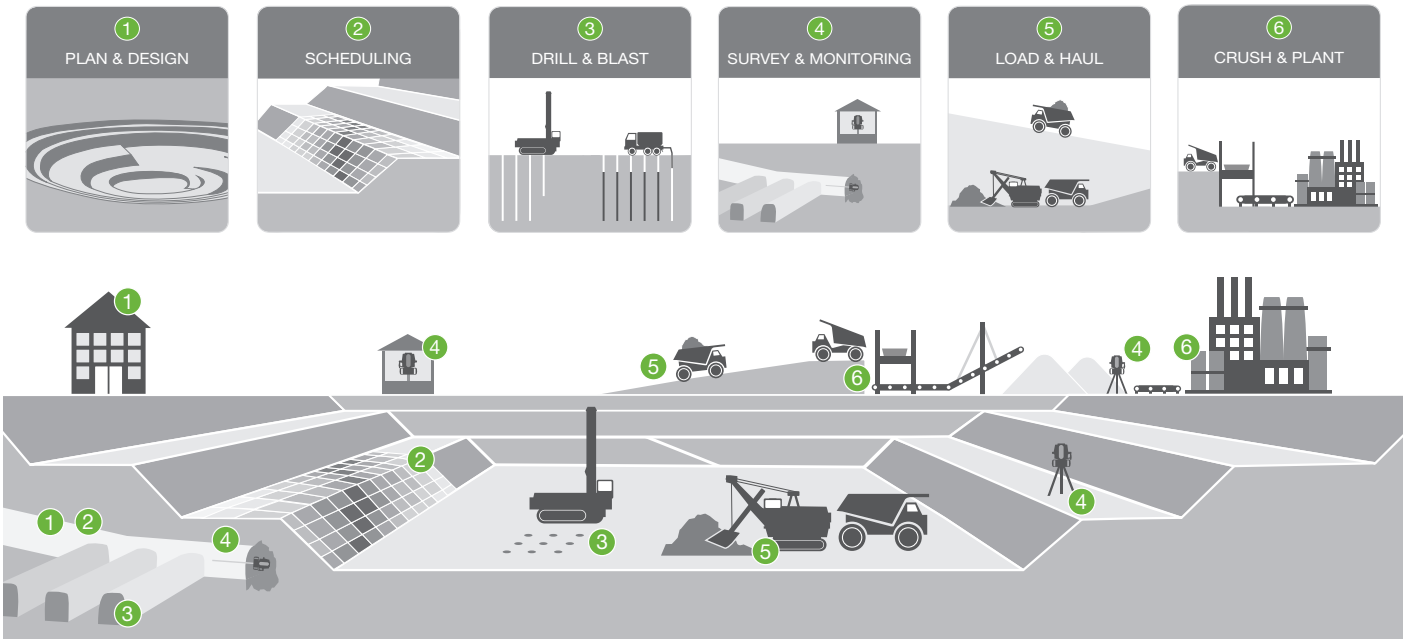
Activities, functions and processes are modelled in the MineSuite Process Model to measure KPIs. This includes the geological and mining business units and the PTP modules and equipment. The PTP model is hierarchical from high level processes down to individual equipment.

Stockpiles have also been identified and modelled as part of the MineSuite process flow. Stockpiles and material on them are associated directly with the source geological reconciliation area. Material can be tracked throughout the process, enabling reconciliation with the geological block model.

Measuring processes

Measuring material movements from source to destination is critical in determining mining performance.

Mined material is measured, processed and moved by various operations such as geological modelling, drill and blast, and load and haul.



Each of these operations has an inherent level of accuracy and importance to the overall efficiency of the mine. All information needs to be recorded and reported on, to allow individual operations and the combined mining system to be understood.

Typical operations in this material movement chain include:

- Geological block models (such as those from Vulcan)
- Drill and blast results (such as those from BlastLogic)
- Load and haul movements (such as those from MineSuite FMS or other systems)
- Supervisory control and data acquisition systems (as used in CHPP systems)
- Laboratory information management systems

MineSuite solution

Most mining operations have at least some existing or automated data which can be fed into MineSuite to avoid the resourcing and accuracy issues with manual or duplicated data capture.

Automatically generated data is uploaded into MineSuite via specific services and may be corrected and validated. MineSuite also provides for manual data entry and validation via the MineReconciler and Electronic Log Sheet.

The data is contextualised and validated, and can be presented in several ways.

In MinLog's experience, whether automatically or manually captured, data may be invalid or erroneous and unsuitable for presentation. MineSuite MineReconciler gives engineers and geologists powerful tools to quickly correct, validate and approve data.

Different dimension formats are mapped for reuse throughout the module and reconciled back to the original geological block model.

> This ensures that the results of each step in the mining value chain can be quickly and effectively measured and analysed in context, eliminating repetitive tasks.

MinLog configured and developed a unique solution to the specific challenges of this implementation. MineSuite has proved to be an adaptable system for collecting and managing data across an operation.

Accurate and timely information is an essential key to improving productivity, and MineSuite solutions can transform your mine.

Get in touch with Maptek or MinLog to find out more about our mine information system solutions.

Flexible modelling approaches

Maptek™ has nearly 40 years of experience delivering geological modelling software to the global exploration and mining industry.

Maptek™ provides an integrated suite of 'implicit', grid, triangulation and block tools to build any type of geological model, through manual, automatic or hybrid processes. Our software is the culmination of millions of development hours and interaction with our customers to provide a universal toolkit for geological modelling.

Implicit modelling is just one of a set of tools used in parsing disparate geological information to build a representative model of a deposit. Implicit modelling on its own can be used to solve some geological problems but it is not the only technique for every orebody or seam.

Implicit modelling is really another term for automated modelling, where algorithms are used to operate on data and generate a mathematical surface model. Maptek pioneered automated modelling of stratigraphic seams, initially for the coal industry in the early 1980s. These tools have been actively enhanced over the decades and are still important for the day-to day-operations of our customers.

Automated modelling is now in vogue for precious and base metal deposits, and Maptek has extended software capability to cover industry needs in this area.

Recent implementations have shown that integrating implicit modelling in a broader geological modelling workflow within the Maptek Workbench has significant advantages over trying to combine multiple third-party applications.

For each set of data, there is no single, unique implicit solution when modelling. Input parameters can be modified to provide some user control during the process.

> Generating a range of output surfaces allows uncertainty in the model building process to be assessed and taken into account for subsequent resource modelling.

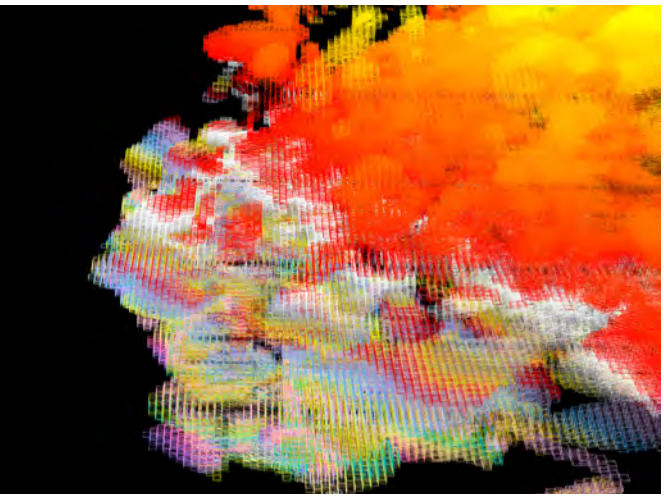
It must be remembered that even if using a single surface to constrain attributes with a resource block model, this surface is only a model, an approximation, or an average value of the real position of the geological surface. Geometric uncertainty is often overlooked through the emphasis on modelling of the distribution and interpolation of numeric analytical data within a resource model.

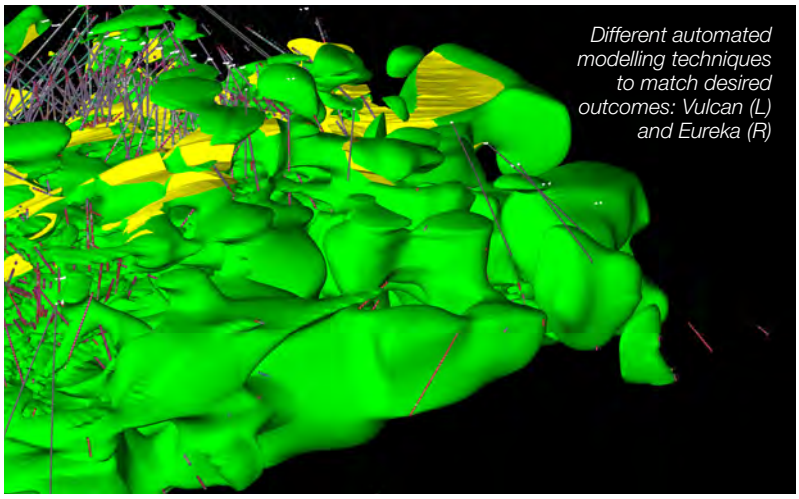
With Maptek software users can better understand the potential impact of uncertainty on the economics of mining.

Geological data can be complex, and computations can stress even modern computing. Automated modelling by necessity is a batch process. The user must define input parameters, add data, model, wait while output is generated, review data, change input parameters and repeat the process until a desirable result is attained.

Maptek's development roadmap will extend current modelling techniques to provide dynamic response to changes in input parameters, providing fast turnaround and timely decision support for planners.

Talk to us about your implicit modelling needs.





Different automated modelling techniques to match desired outcomes: Vulcan (L) and Eureka (R)

Global activities

Maptek Calendar

2018

June 6-8
RIM Zacatecas
Zacatecas, Mexico – Booth 65

June 7-8
Elko Mining Expo
Elko, Nevada, USA – Booth 110

June 9-15
Fragblast
12th International Symposium on Rock Fragmentation by Blasting
Luleå, Sweden

June 26
Copper to the World
Adelaide, South Australia

June 27-28
International Lithium Conference
Perth, Western Australia

August 22-25
6th Congreso de Minería de Durango
Durango, Mexico – Booth 9

August 30-31
II Seminario de Planeamiento Minero 2018
Medellin, Colombia

September 11-13
Minerals Week
Canberra, ACT, Australia

September 12-14
Australian Institute of Mine Surveyors Annual Conference
Townsville, Queensland, Australia

September 12-14
Expomina Perú 2018
Lima, Perú - Booth E186 - E187

October 14-18
Australian Geoscience Council Convention 2018
Adelaide, South Australia

October 23-26
13th Congreso de Mineria de Sonora
Hermosillo, Mexico – Booth 252

November 28-30
AusRock 4th Australasian Ground Control in Mining Conference
Sydney, NSW, Australia