Forge

In this issue

Welcome to our Forge newsletter September 2022

It might seem that disruption has so far defined the 2020s, but it has also started important conversations about how we want to work and the technologies that will help us do this in a sustainable and safe manner.

One of the principles guiding how Maptek develops solutions that empower miners to make better decisions is Create Tomorrow. We aim to make tomorrow better than today for our customers and employees by encouraging change and new thinking.

Experimentation is a key characteristic of innovative organisations, and this issue introduces an initiative that champions staff to think, try, collaborate and create new approaches to industry problems. Customers will benefit from two projects finding better ways to visualise and animate data.

To share our ideas with industry we have developed a communication platform – labs.maptek.com will showcase ideas and projects with links to find out more. Our global solutions strategy team welcomes feedback from customers and other players in the mining industry at any time.

In this issue we have also outlined our strategy around drill and blast. We seek to future-proof our customer sites and deliver maximum value from blast design, performance and reconciliation data to operations as a whole.

It is obvious that the latest technologies help our customers work smarter, faster and safer. A good example is the cutting-edge 3D spatial data collection methods and software processing used to assess the safety of derelict railway tunnels in Pennsylvania, USA.

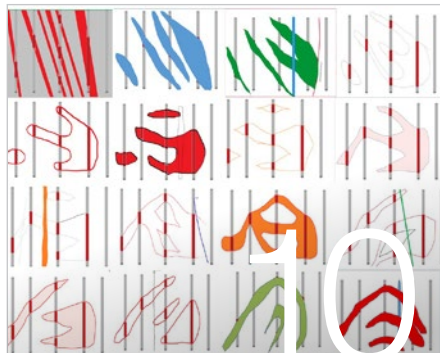We hope you enjoy this issue and look forward to sharing more success stories during 2022.
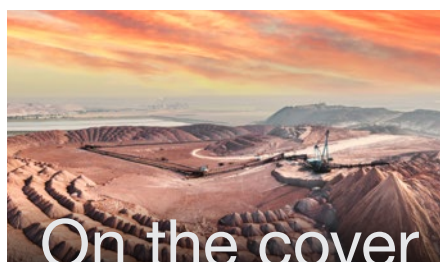
Eduardo Coloma
CEO
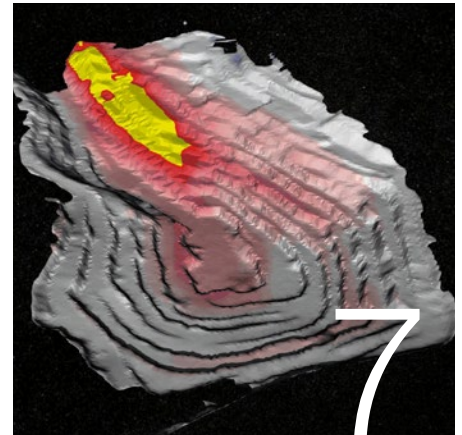
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On the cover

Maptek solutions help our customers by empowering them to make safer, more productive decisions

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Historic railway gets back on track

Modern survey technology has been applied to assess the safety of derelict railway tunnels and collect data for rehabilitation planning.

Wingfield Scale & Measure is applying cutting-edge 3D spatial data collection methods and modelling software to assess the safety of derelict railway tunnels in Pennsylvania, USA.

The East Broad Top Railroad (EBT) National Historic Landmark is the oldest surviving narrow-gauge railroad east of the Rocky Mountains. The EBT non-profit foundation is dedicated to restoring and preserving 27 miles of rail lines, six steam locomotives, a roundhouse, rail and engine manufacturing shops, as well as passenger and freight cars.

Since 1937, Wingfield Scale & Measure has been a leader across the USA in the industrial scale and weighing systems industry. The Tennessee-based business expanded into bulk inventory measurements in 2013 using terrestrial laser scanning.

EBT approached Wingfield to assess rehabilitation possibilities for tunnels that had been bored in 1874. The Sideling Hill and Wrays Hill tunnels had not been used since 1956 when the rail line closed. Structural conditions were a significant safety concern, preventing access for traditional inspection methods.

Autonomous data collection was determined as the ideal approach to safely and effectively map the tunnels before initiating rehabilitation efforts.

Wingfield used multiple data collection methods over one field day to capture 106 GB of raw data. Efficient data capture and post processing techniques delivered high quality verified 3D models of more than 2000 ft of inaccessible tunnels to EBT.

Aerial LiDAR, Maptek™ SR3, FARO S350, Emesent Hovermap, DJI M300 drone and Spectra Precision GPS were all used. The collected data was combined into a single dataset in Maptek™ PointStudio™ where the final deliverables were produced.

Wingfield Senior Engineer James Kenney said that autonomous UAVs made it possible to collect high calibre data, and PointStudio brought the best out of that data.

'The robust filtering, enhanced visualisation and modelling options allow the mapping team to check data quality and coverage to ensure accuracy and note areas of interest,' Kenney said.

Proprietary workflows combine lidar and photogrammetry platforms to optimise field data capture and enhance the overall deliverables.

UAV in flight returning from mapping Sideling Hill tunnel
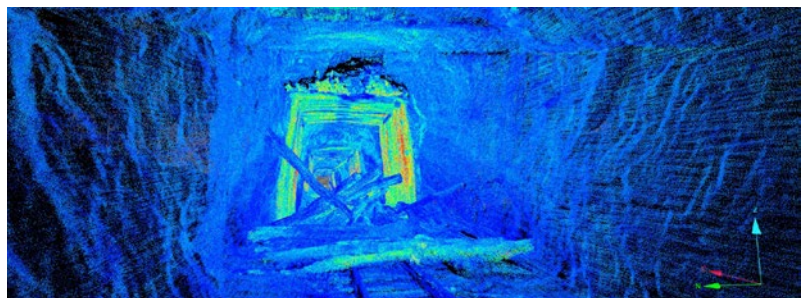
Emesent Hovermap data displaying collapsed support timbers inside Wrays Hill tunnel
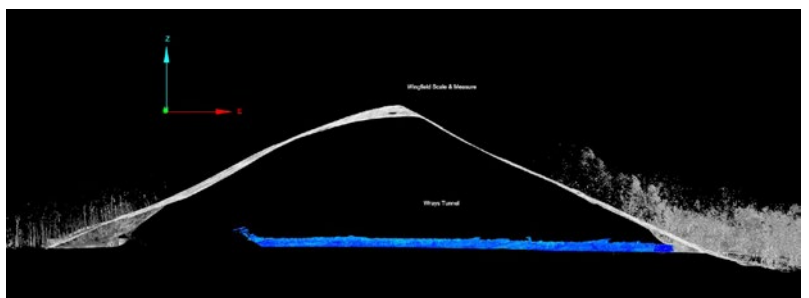
Cross section side view of Wrays Hill tunnel showing data from aerial LiDAR (white surface), Maptek SR3 (tunnel entrance, right), FARO S350 (collapsed tunnel exit, left) and Emesent Hovermap (blue tunnel)

Autonomous mapping systems delivered new data for several locations that had not been accessible or lacked 21st century documentation.

The data captured aids in the rehabilitation and planning for future work. Remote mapping provides a higher level of safety by removing personnel from potential risk.

'Safety should always be at the forefront. The tunnel mapping data provides clients and contractors with real information to support decisions on how to best approach the rehab phase of the project,' Kenney said.

'I hope one day to ride on the restored EBT railroad with my family and see more of the rail line. Preserving history is very important – connecting with the past helps us work towards a positive future.'

Kenney is enthusiastic about the technology advances in the 65-plus years since the last steam locomotive rolled through the tunnels.

'How great is it that in 2022 the next 'engine' to enter the tunnels is an autonomous UAV with a laser lidar scanner. It is fantastic to see the old and the new combine, and for historical landmarks to be shared with global communities.'

EBT Director of Engineering James Roslund is excited at the use of new technology to refurbish the 150-year-old railroad.

'It is amazing seeing the past come alive through the data gathered,' Roslund says.

'The lidar mapping is incredible, and we had no idea how detailed it would be. This helps us document and better plan refurbishment while minimising safety risk.'

The knowledge gained through this project will allow the focus to turn to the actual rehabilitation work. The project owners already anticipate a post-rehabilitation role for lidar, specifically to record a precise map for future comparisons.

FARO S350 data of collapsed Wrays Hill tunnel exit
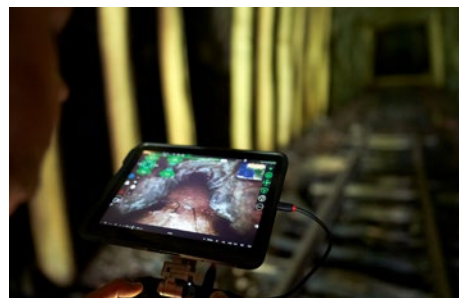
Emesent Hovermap flight controls showing the collapsed back about 1000 ft into Wrays Hill tunnel
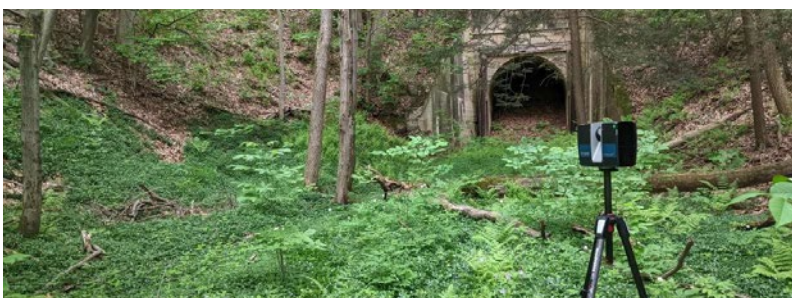
FARO S350 scanner in front of Wrays Hill tunnel exit – note the surrounding vegetation and condition of the outside rail lines
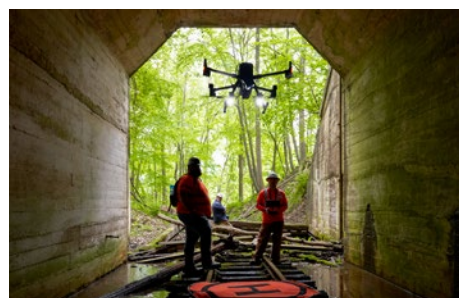
Austin Brooks (L) and James Kenney (R) piloting the Emesent Hovermap in Sideling Hill tunnel

Stronger, easier resource governance

K2fly Resource Reporting is a secure, cloud-based platform that enables confident, secure mineral resource and ore reserve governance, compliance and reporting.

Environmental credentials are at the forefront of the mining industry's licence to operate, with Environmental, Social and Governance (ESG) activities top priority for many operators. K2fly Resource Reporting addresses the big G in ESG.

The K2fly software is used by major global miners including Rio Tinto, Glencore Zinc, South32, Newmont, AngloGold Ashanti, Teck Resources, Goldfields, Coeur, Freeport McMoRan and Newcrest. Earlier this year Maptek™ became a strategic investor in K2fly.

Resource Reporting helps meet the ever-increasing demands placed on public reporting of mineral resources and reserves by providing a one-stop shop for all mineral inventory related information and approvals.

Resource and reserve reporting is one of the most established and understood forms of governance in mining companies. It can be leveraged across applications such as tailings management, heritage, landform remediation and closure liability planning.

Reporting requires strong governance over the models from which the information is sourced, and because public reporting of mineral resources and reserves is required by listed mining companies, all stakeholders need to be confident they are working with a reliable process.

Companies using spreadsheets, web-based sharing applications or inhouse custom-built systems risk getting it wrong by using error-prone and disparate methods to manage the data. Typically only one person has access to the data, which creates a dependency risk for what is a business-critical function.

The K2fly Resource Reporting solution provides a simple way to capture raw data, track data ownership, and accurately adhere to all reporting requirements to meet global stock exchange reporting rules.

Accountability for people and teams tasked with reporting is strengthened through digital workflows, systemised security, data validation tools and repeatable reporting processes. Workflows capture and validate data before the information is made available for review, approval and sign off. Consent Letters and Competent/Qualified Person Nominations are also managed in the system.

The centralised data storage, digital workflows and ability to validate and review outputs prior to publishing makes personnel responsible for reporting feel more confident and in control of their data, process and final reports.

K2fly Resource Reporting removes risks associated with manual paperwork. Copying the previous year's data and reports to the current year simplifies the updating process. Year-on-year comparisons via waterfall charting and flexible configuration options to suit multiple processes and 'slice and dice' data has impressed users.

K2fly CEO Nic Pollock recognises the cost of getting regulatory reporting wrong is high, leading to reputational damage, loss of company value and stakeholder trust, and impacts the social licence to operate.

'Resource Reporting ensures governance and transparency in the reporting process and reduces the work and stress on the QPs and CPs that have to sign them off each year,' Pollock said.

'K2fly Resource Reporting is the only commercial off-the-shelf solution that addresses the changing regulatory frameworks that need to adhere to international reporting standards.'

K2fly will release a new Resource Governance Platform later in 2022, underpinning multiple solutions. New modules like K2fly Mine Reconciliation and K2fly Model Manager will further enhance technical assurance, governance, and public disclosures.

K2fly and Maptek™ have announced plans to integrate K2fly Resource Reporting and Maptek™ Vulcan™.

Integration will allow mineral resource and reserve estimates generated from Maptek Vulcan block models to be ported directly to the K2fly database. This means publicly reported information can be traced back to the source block model and parameters used to generate estimates can be queried. Seamless integration sets the foundation for deployment of automated processes.

The digital workflow functionality provides stronger governance, confidence in public reporting, traceability to the sourced data and greater efficiency in the annual reporting process.

Thanks to K2fly

GeoSpatial Manager

A new solution for visualising surfaces will help open cut mining and civil engineering operations to more easily access survey updates across the life of a project.
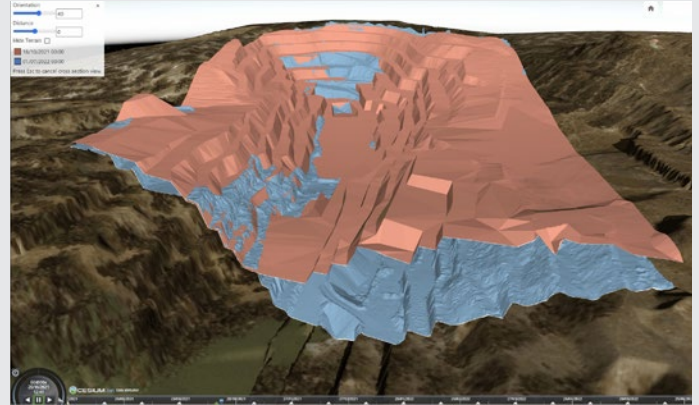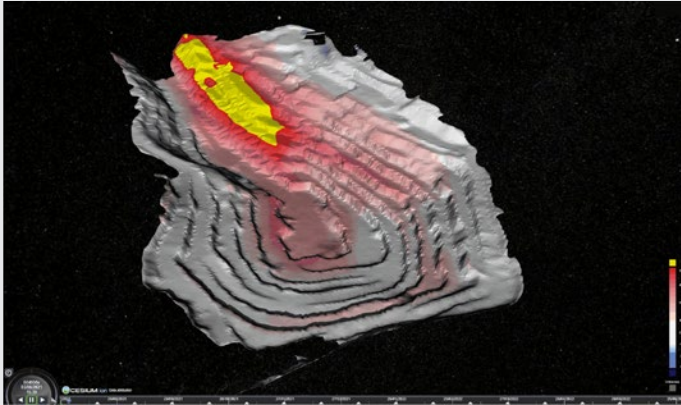
GeoSpatial Manager combines smart visualisation tools with a simple interface. The result is an easy-to-use system for managing as-built surfaces that can be accessed by everyone in an organisation via a web interface.

The unique solution dynamically updates surveyed surfaces, allowing users to manage, visualise and download any as-built surface at any point in time over the life of a project and apply it to downstream tasks.

Maptek™ intends that customer systems will ultimately be able to connect via API with any Maptek product including Vulcan™, Vulcan GeologyCore, BlastLogic™, PointStudio™ and MaterialMRT.

Managing survey data volume

Managing the volume of survey data available is a long-standing source of frustration for project leaders and survey managers. Increasingly large amounts of data will only continue to put pressure on people, time and systems.

Varying frequencies or cycles for updating site topographies and different data gathering and storage methods are common. Databases may be set up for different areas without any correlation between individual areas or the overall site.

Engineers risk using out-of-date surfaces for design work, or losing productivity by waiting for updated data.

Additional opportunity is lost when teams cannot automate other tasks because the most recent surface has not been stored or made available in a systematic way.

All of these factors create uncertainty in knowing which surfaces are the most current and which should be used.

Closing the gap between data and value

Knowing exactly what an operation looks like now and at key points in time improves understanding, efficiency and collaboration. GeoSpatial Manager allows users to download a portion, or the entire full resolution surface, for a specified date and time, and apply it to any task in their operation.

A single platform allows all surfaces for a project to be accessed and dynamically visualised using a time slider. Centralised storage on a cloud or network server avoids frustration and risk arising from locating survey files that may be stored in various folders on a local or server machine.

Maptek identifies several benefits of GeoSpatial Manager:

> Single source of survey truth
> Dynamic surveyed surface updates
> Improved efficiency and inter-team communication
> Cross-team collaboration via web-based interface

Watch the video at labs.maptek.com and get in touch with Maptek to request a demonstration with your data.

'Our various survey teams were all saving files in their own networks, using different naming conventions. Retrieving files from across the project to show the status of as-builts on a given date was uncoordinated and prone to inaccuracy.'

Future-proofing drill and blast

The advent of Maptek™ BlastLogic™ has given engineers the ability to anticipate and effectively plan for possible scenarios as part of their design process.

The wide adoption of Maptek™ BlastLogic™ drill and blast design and reconciliation solution over the last decade means that on-bench activities relevant to engineering processes are now largely digital.

Crews often need to make decisions on the fly, and want to avoid downtime due to unforeseen situations. Because conditions on the ground don't always match the idealised design, a digital pathway is critical. Any new information recorded is instantly updated, and is available to engineers to track, review and push further updates to the design as required.

Future-proof designs

Global Product Strategy Manager Mark Roberts says engineers can build contingencies into a digital design to ensure the correct response when crews encounter issues such as water in holes or holes of different depth to design.

'BlastLogic dynamically updates according to changes, which is a welcome step-change for industry,' Roberts said.

'Engineers can come up with designs, use the BlastLogic charge rules to test possible scenarios that might occur on the bench and define how the designs must change to account for them.'

'BlastLogic updates automatically so the operations crew don't need to worry about potential changes or wait for the engineers to review and update their designs.'

The Maptek approach helps future-proof the end-to-end drill and blast process. This was front of mind when developing the new BlastLogic Tablet custom display feature, set to be released this year.

Custom display

Maptek receives many requests from operations to digitalise processes through displaying different information on the tablets. Examples include hole sampling and temperature monitoring, and tracking drilling activity for drill systems lacking high-precision navigation.

Another need expressed was to reconcile explosive products usage to meet regulatory requirements. In some regions a blast cannot be fired until all products loaded into the blast holes are accounted for and matched against the issued and unused inventory.

'Using the BlastLogic Tablet removes paper and streamlines that process of accounting for all explosive consumables – from being checked out in the magazine, loaded down blast holes, and then implemented on a given shift by multiple personnel,' Roberts said.

> 'With a digital process crews and engineers can rely on the accurate recording of information, and any errors in data inputting can be quickly identified and corrected.'

Maptek approached the custom display functionality by addressing known current requirements, and developing it on an open, adaptable platform to support future use cases.

Simple scripting allows users to customise how information is displayed on the tablets, such as changing the hole colouring and characteristics along with the accompanying legend to provide visual context.

A set point in time

There is immense value in dynamic updates providing a single source of truth for the mining environment. However, a fluid dataset presents challenges for some blast design tasks. For example, it can disrupt the flow of an engineer creating a tie-up design.

'Dynamic update of the charge plan with the geometry and characteristics of holes as new information becomes available is very useful for reconciliation, but these automatic changes are less useful when trying to design a tie-up,' Roberts said.

A snapshot feature coming in BlastLogic 2022 will benchmark conditions at arbitrary times in the process to simplify planning. A reference design snapshot is automatically created on publishing a blast, representing the design hole geometry that is considered the canonical design.

The snapshot captures a blast with any combination of design, drilling, dipping and backfilling geometry data, together with planned, loaded or reconciled charge data. This saved picture of that point in time does not update when downstream changes are applied to the hole, and allows for better reconciliation and analysis.

Engineers will have flexibility to accept the charge plan associated with those holes at that time, or apply a different charge rule or charge plan, and can then perform a tie-up design in a stable environment.

Open for integration

On-ground conditions such as the state of holes are not the only changes that occur on a mine site.

Given that operations often switch equipment or software providers, an agnostic development approach safeguards BlastLogic users.

'We've developed BlastLogic from the start with a fundamental design principle allowing integration with off-the-shelf third party systems,' Roberts said.

'If an operation changes drill system manufacturer or explosive contractor, they don't have to change their drill and blast design technology.'

To achieve the goal of a completely digital, paperless drill and blast business process requires collaboration and integration between technology providers and suppliers of explosives, drilling systems and other equipment.

Maptek actively seeks and supports integration points with technology companies and manufacturers to deliver the maximum benefit to customers.

In other exciting development news, Maptek continues to finetune BlastMCF in concert with early adopter feedback. BlastMCF is an ambitious project targeting the automated creation of optimised and detailed blast designs using genetic algorithms, with integration to BlastLogic for fine adjustment, and reconciliation of implementation and blast performance.

01 BlastLogic Tablet showing new hole display rule feature for users to define legends, create and save scripts

02 Blast engineers can change the blast snapshot before creating designs

03 Intuitive interface for choosing a snapshot to use in tie-up design
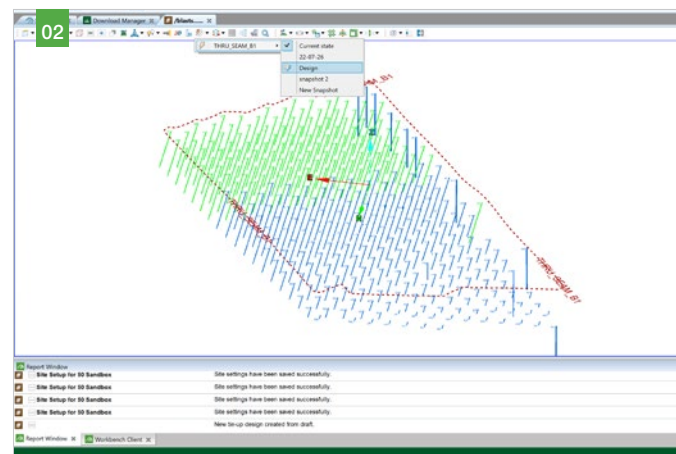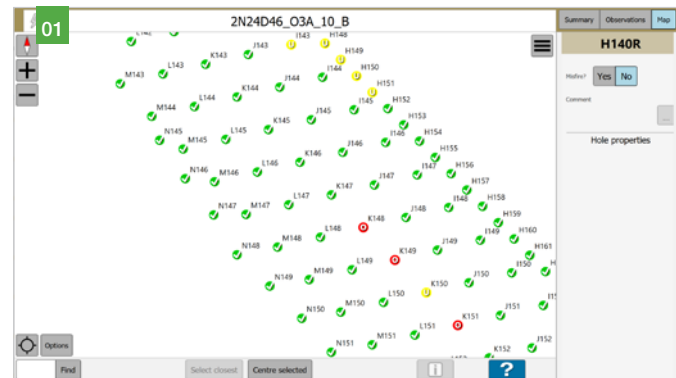
New in BlastLogic 2022

New customisation functionality allows users to configure what they see on the BlastLogic Tablet to suit their needs.

The *Blast* page displays blast summary information and a view of the holes within the blast, replacing and incorporating functionality from the *Observations* page.

New hole display modes, selectable via the menu, are available for drilling, dipping, backfilling, charging and blast views. New *Hole display rules* allows users to quickly define their tablet legend, create and save scripts for editing by other users.

Blast snapshot captures any combination of design, drilling, dipping, backfilling geometry data, with planned, loaded or reconciled charge data, providing a stable design environment. A new snapshot can be created if the reference design is updated after publishing.

Other updates include improved hole tabular arrangement and visibility, label or flag options for displaying water and intervals, and optimised timing tool orientation for electronic tie-up.
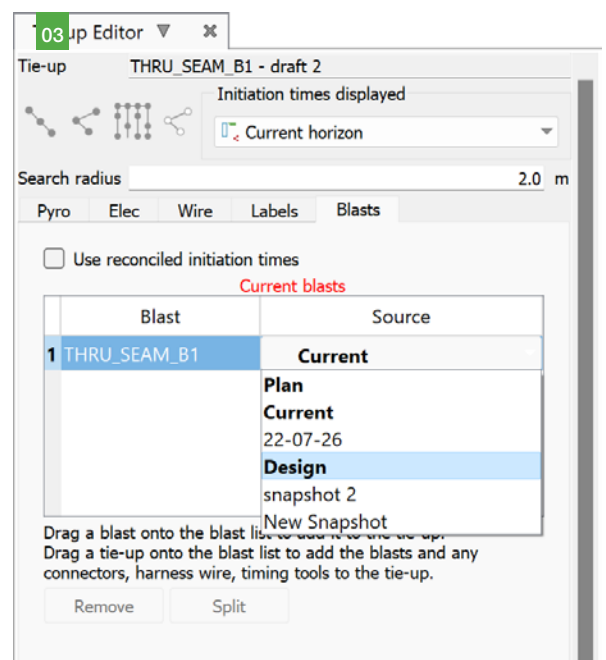
Alternative geological interpretations

Maptek™ DomainMCF provides a data-driven process to generate alternative models to satisfy JORC reporting standards.

Maptek™ presented a case history on generating alternative geological interpretations from a fixed set of sample data to the 3rd AEGC conference in Brisbane in late 2021.

A simple, theoretical dataset was prepared as shown in Figure 1. The challenge was to interpret the potential geological correlation of the red intervals in the drillholes provided on a single traverse.

This interpretation challenge was completed by more than 100 geologists and resulted in 20 different interpretations (Figure 2).

This case history shows that it is possible – from a fixed set of data – to generate many alternative interpretations. Additionally, all interpretations in the study are equally geologically valid.

Geological interpretation is subject to personal decisions by the practising geologist on how particular pieces of observational data are linked in three dimensions.

Analysing the outcome of the interpretation exercise, which was expected but not to the degree manifested, leads to the conclusion that the interpretations are potentially a reflection on personal geological experience.

If the interpreter has spent a lot of time working in narrow vein deposits, the mineralised intercepts will be easily joined to reflect that natural bias. A geologist highly experienced in systems with folds, may intuitively choose that route to interpret the cross section.

Recognition of personal experience and bias is important. Independent review of interpretations by peers and third parties is essential, especially when working on new projects where open cut or underground exposures do not yet exist to substantiate the geological model.

The reporting guidelines for the Estimation and Reporting of Mineral Resources, as set out in the 2012 JORC Code by the Joint Ore Reserves Committee, includes a requirement for the Competent Person to make statements on the effect of alternative geological interpretations on the mineral resource.

A completely independent geological assessment is seldom commissioned when generating a resource report.

A review of recent ore resource reports to the ASX showed that very few mentioned consideration of alternative interpretations. Often the reports ignored this reporting requirement. If mentioned, a common statement was along the lines of '*The current geological interpretation is considered robust.*'

Alternative interpretations are not sought mostly because of the time and cost involved. In more recent times, the lack of geological staff to perform alternative studies is a consideration.

Introducing DomainMCF to your reporting process provides you with a second or alternative geological opinion, which is not only fast, it is significantly more cost effective than any other method.

Most deposits can be modelled using the DomainMCF machine learning engine in less than an hour and the outcomes are so geologically valid that they surprise even the most experienced resource geologist.

DomainMCF provides a data-driven process to generate an alternative model to satisfy the 2012 JORC Code reporting standard. At the same time it provides interpretations which truly represent the input data, freeing up the overstretched geological staff for working on data quality, data collection and analysis.
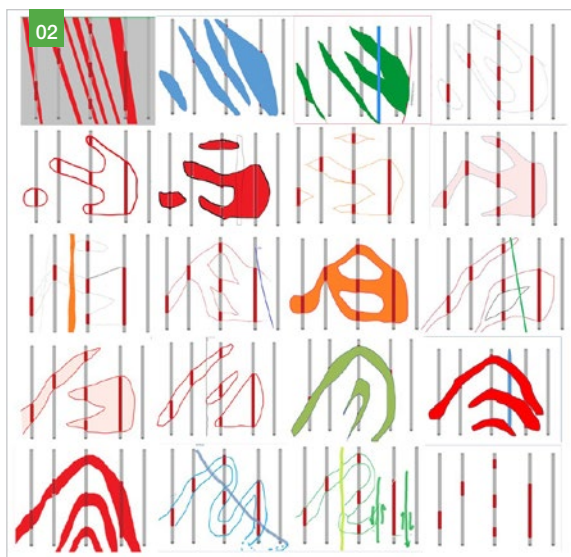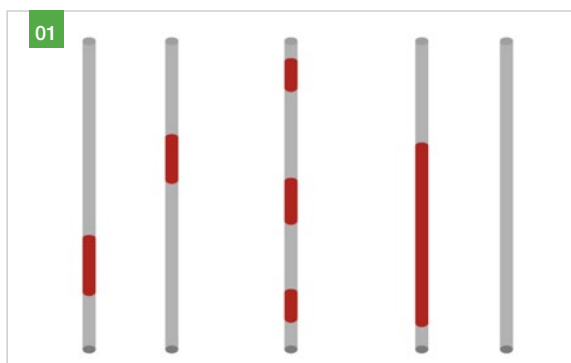
01 Drillhole intervals in red presented for geological interpretation

02 Alternative geological interpretations based on sample data provided in Figure 1

Technology innovation award

The Maptek™ 2022 Woman in Resources Technological Innovation award honours work on a Coarse Ore Flotation circuit for the Cadia Valley Operations in New South Wales.

Senior Plant Metallurgist Emily Jaques from Newcrest Mining has won the 2022 Woman in Resources Technological Innovation award for her work on a Coarse Ore Flotation (COF) circuit for the Cadia Valley Operations in Orange, NSW.

A passionate role model for the resources sector, she promotes technology and innovation across the site, business, industry and local community.

Jaques joined the Newcrest Graduate Program with a Chemical Engineering degree from the University of New South Wales. In her role as the Concentrator One Plant Metallurgist she was responsible for the Cadia COF circuit and the opportunity to implement value-driving initiatives.

The COF project involved recovering coarse composite particles that normally report to the waste stream.

'The circuit was the first application of the Hydrofloat™ technology for sulphide recovery in the world – conventional flotation technology could not recover the valuable particles we were targeting,' said Jaques.

As the metallurgical/operator interface project leader, she provided opportunities to female vacation students and graduates to work with the new COF technology.

Jaques enjoys reaching out to female school students and sharing her achievements to break down stereotypes that may prevent them from considering careers in mining.

Participating in the AusIMM WIM mentoring program empowered Jaques to connect with other women in the industry. She draws on her experience to help orient new people to site and support them as they mature in their roles.

> 'Innovation to me means applying novel and creative solutions to problems that previously appeared unsolvable.'

Other finalists in the Maptek Technological Innovation category in the BHP 2022 Women in Resources Awards, hosted by the Minerals Council of Australia, were Kim Tan, Kimberley Robertson, Kirra Harris and Gemma McGoldrick.

Academic programs look to the future

Maptek™ helps students across the world, working in partnership with universities to shape future careers and create a bright tomorrow for industry.

Stacy Epiga, Badisheng Morena and Professor Freddy Bokwala at the Lubumbashi Polytechnic Faculty

Maptek™ has expanded its program in Southern Africa to include the University of Lubumbashi in the Democratic Republic of Congo.

Students in the Polytechnic Faculty will have access to academic licences for Maptek™ Vulcan™ and PointStudio™ software and academic staff will receive training in how to use the tools so they can support their classes.

Maptek™ BlastLogic™ Sales lead Badisheng Morena and Sales & Mine Planning Consultant Stacy Epiga enjoyed a tour of the Polytechnic Faculty and met academic staff who are involved in the undergraduate program.

'We are honoured that the University has agreed to join the Maptek University Program,' Morena said.

'We look forward to working with the lecturers to equip students with skills that will better prepare them for productive careers in the mining industry.'

The academic program ensures the mining professionals of tomorrow have access to mining technology that will empower them and inform decisions at mines.

Creating tomorrow's data visualisation

Maptek staff experiment with new ideas and collaborate with colleagues as they explore different approaches to solving existing problems.
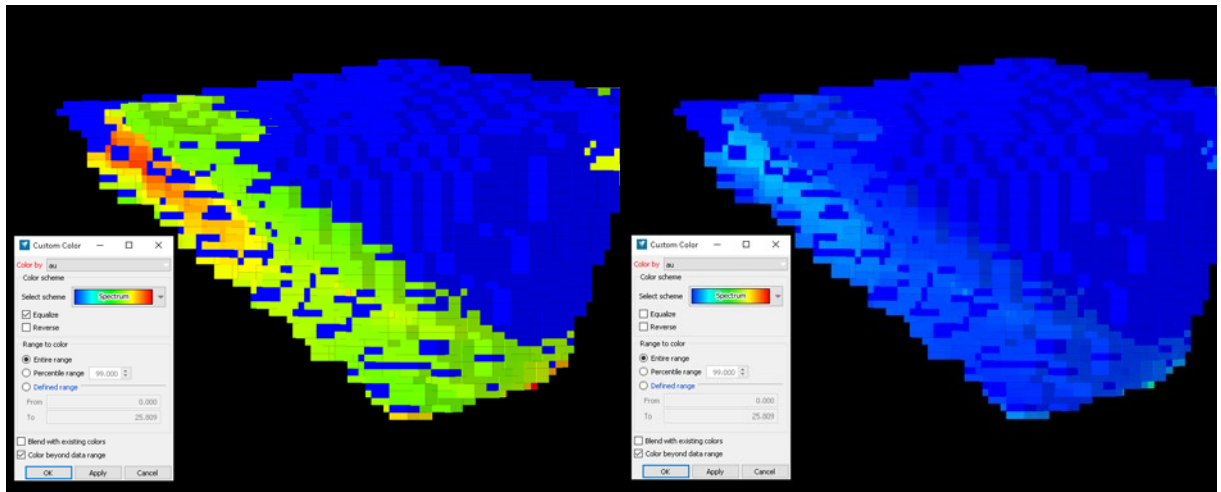
Maptek™ introduced an initiative in 2020 that champions staff to explore different approaches and experiment with new ideas. It aligns with one of our principles – Create Tomorrow – by encouraging change and new thinking. Known as '10% time', it has brought some interesting outcomes.

Transparency leads to breakthrough

This freedom to experiment has allowed Maptek Software Engineer Sean Donnellan to lay the foundation for improved data visualisation in Vulcan GeologyCore.

The Data and SDK Team Leader was viewing atmospheric data in the Maptek 3D visualisation environment and wanted to generate a colour legend with adjustable transparency using Python scripting.

'At first, I used the tool that assigns a colour to each block rather than creating a legend; the result was quite impactful and I could see patterns in the data,' Donnellan said.

With the standard legend creation tool, the results were different, as almost everything looked the same colour.

'I checked to see if it was to do with the ranges but it wasn't. When I unchecked the Equalise option, the colouring matched the results from the first tool.'

Donnellan shared his findings with colleagues and Head of Experimentation and Technology Simon Ratcliffe suggested ways to tweak the algorithm so it would produce fewer control points in the legend.

The initial challenge was identifying the cause of the difference in the two options and thus what feature was missing. The subsequent ongoing challenge is trying to reduce the number of control points needed in the legend to produce the ideal visualisation environment.

> Future development will ensure better colour legends, which can be applied to multiple objects and provide a clear visual reference guide to data values.

'The 10% time program is a wonderful opportunity to tackle a problem that wouldn't otherwise make it into our applications,' Donnellan said.

'It's easy to experiment with ideas that benefit Maptek development teams but the bigger challenge focuses on helping industry. It feels good to realise the potential for experimental work and see it translated into tools and features in customer hands.'

Maptek 10% time allows staff time to think, plan, create, experiment and collaborate in new ways.

Advanced maths smooths the path

Maptek Software Engineer Ryan Cuthbertson used 10% time to revisit his student project to improve the data viewing experience.

Fly-throughs of 3D data loaded in Maptek software are commonly used to showcase a project, communicate a concept or convey a design to various stakeholders in mining operations.

Existing tools worked quite well, however the camera movement was often not smooth, leading to a 'bumpy ride' for viewers.

'We've always wanted to make this smoother and achieving it required applications of advanced mathematics,' Cuthbertson said.

Animations of 3D data are produced from a sequence of keyframes (snapshots of frames) and the software needs to work out how to move the camera between keyframes to make the experience visually appealing.

Camera position can be considered in terms of x, y, z, roll, pitch and yaw. The simplest way to create an animation is to change the values in a regular manner between each keyframe, but this produces a robotic and unnatural motion.

More than 10 years ago, Maptek smoothed the camera path (the x, y and z) by applying Bézier curves, and now Cuthbertson wanted to tackle the roll, pitch and yaw.

> This step is more challenging because objects seen at the start and end of each keyframe pair interpolation must be kept in view. Simply smoothing the orientations would result in an apparent rocking motion.

'We wanted to simplify the viewing experience. But to make things simpler, we needed to make them more advanced under the hood,' Cuthbertson said.

He explored ideas with Maptek colleagues and consulted research papers to work out the mathematical concepts involved.

'This experimentation project was a chance to live my own values by pursuing a project oriented primarily around beauty, excellence and the human experience.'

'Being able to employ mathematical ideas, follow my curiosity about whether the idea would work as imagined, and ultimately to see that it does, was extremely satisfying.'

Watch the video of the smoothed animation project
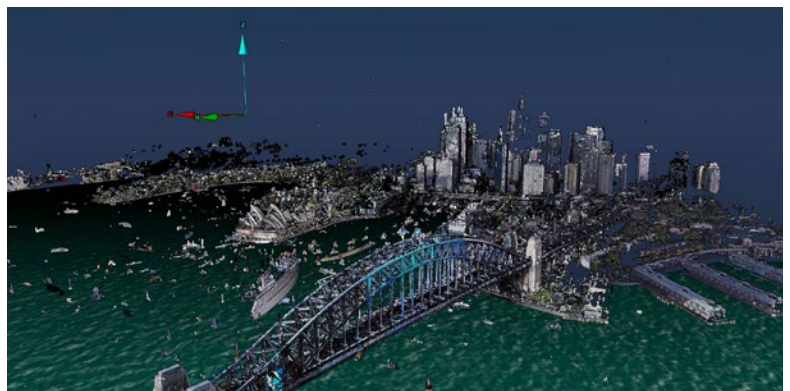
Museums bring mining history to life

Maptek™ scanners and training for volunteers at Colorado museums will help educate the wider community about the contribution of the mining industry.

Visitors to the Western Museum of Mining & Industry in Colorado Springs and the National Mining Hall of Fame Museum in Leadville will soon be able to enjoy live demonstrations of Maptek™ lidar scanners as well as Maptek™ PointStudio™ software.

These digital technologies will help visitors of all ages understand how mining works today and how vital modern software and hardware are for an operating mine.

Maptek has donated a laser scanner, tripod and tablet. Educational software licences will allow museum volunteers to interpret and visualise the 3D data collected from the long-range scanners.

Maptek will host training sessions so that museum volunteers can become familiar with the new technology.

Maptek Technical Solutions Engineer Jorge Sanchez will deliver the training at the Matchless Mine in Leadville, Colorado. This historic site was an operating silver mine from 1879 to 1938.

Matchless Mine visitors can tour the hoist house, headframe, powder magazine and cabin, as well as see the mine from a distance. This is the perfect training ground for museum volunteers to learn the basics of laser scanning and processing of 3D point cloud data.

The training will answer the fundamental questions about how LiDAR scanners work and how the outputs can be used. *How does this data and technology help in mining? Which mining professionals would typically do this work?*

Sanchez plans to incorporate fieldwork for data collection and time in an office environment to process, model and analyse the data.

The aim is for the volunteers to reach a level of familiarity that allows them to give live demonstrations to museum visitors of all ages.

Both the Western Museum of Mining & Industry and the National Mining Hall of Fame Museum strive to educate the public about the mining industry and shine a spotlight on mining career paths.

The museums anticipate that the displays will convey how much the industry has changed since the time of the Matchless Mine in regards to technology, innovation, and safety.

Maptek is confident that these interactive technology displays will inspire the engineers, geologists, surveyors and mining professionals of tomorrow to join our industry.
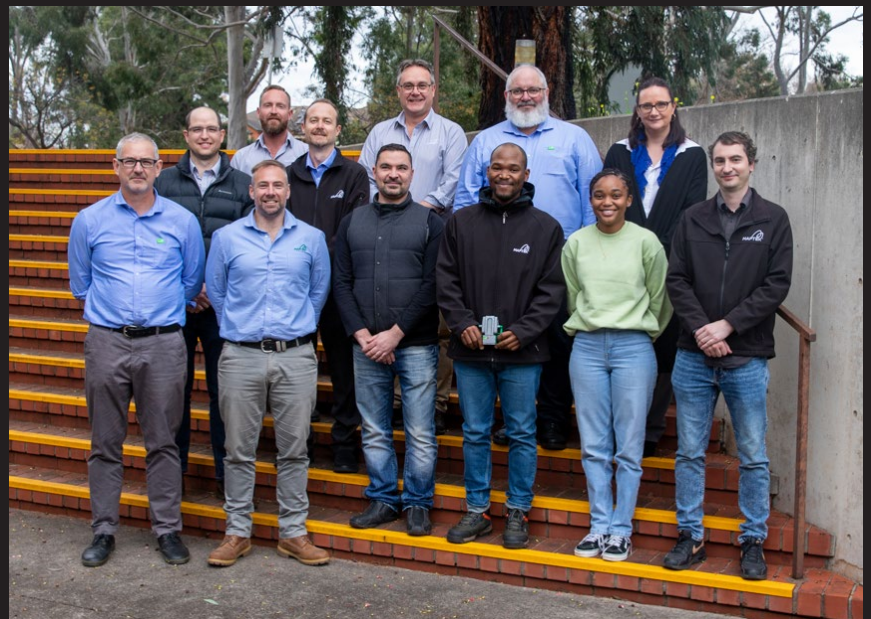

National Mining Hall of Fame and Museum (L-R): Jordan Bennett (Museum Curator), Elizabeth Dinschel (Executive Director)

Western Museum of Mining & Industry (L-R): Joe Stephens (Volunteer), Jackie Walls (Marketing/Communications Coordinator), Jaime Gorrell (Retail/Rentals Coordinator), Deb Akers (Intern), Dr Rick Sauers (Curator), Grant Dewey (Executive Director), Ben Elick (Intern), Ashley Collins (Intern)

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