



March 2022 Newsletter

# Forge

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# Welcome to our Forge newsletter March 2022

Each issue this year will highlight customers using new approaches to enable better decisions and achieve their safety, productivity and performance goals.

One such company is BMA – with help from MEC Mining, Insight and Maptek the Caval Ridge mine has reimaged use of drill and blast data. A dashboard driven by Power BI allows engineers to visualise and harness the reams of data available and focus on performance metrics, enabling them to drive sustainable, progressive change.

Speaking of sustainability, a project with UK-based Minviro outlines how optimised scheduling combines with full life cycle analysis to quantify and reduce environmental impacts throughout the life of a mining project.

Another story demonstrates how one of Africa's largest coal mines has revolutionised its approach to drill and blast by digitally recording drilling plans, drilling data and explosives usage data for reliable, in-depth reconciliation.

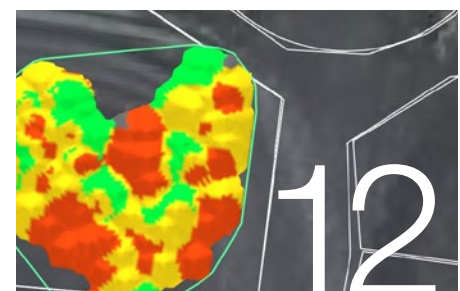
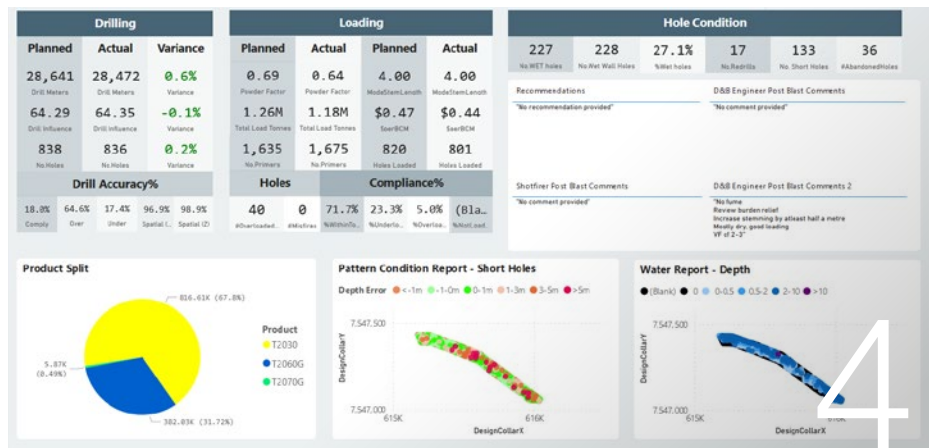
Maptek embraces the opportunity to partner with our customers. We value the contribution of different skills and viewpoints that can transform our thinking and our practices.

Which leads me to a project at the core of Maptek – our enhanced ideology. This makes clear that our objective is to forever change the way mining is done.

We will do this by encouraging new thinking and supporting change, by listening to our customers and collaborating with them, drawing on each other's strengths to turn complex ideas into simple solutions.

We hope you enjoy this issue and look forward to sharing more success stories during 2022.

**Eduardo Coloma**  
CEO



## On the cover

Maptek solutions cover the full extent of mine processes to help track compliance with your resource model

Contact us: [forge@maptek.com](mailto:forge@maptek.com)

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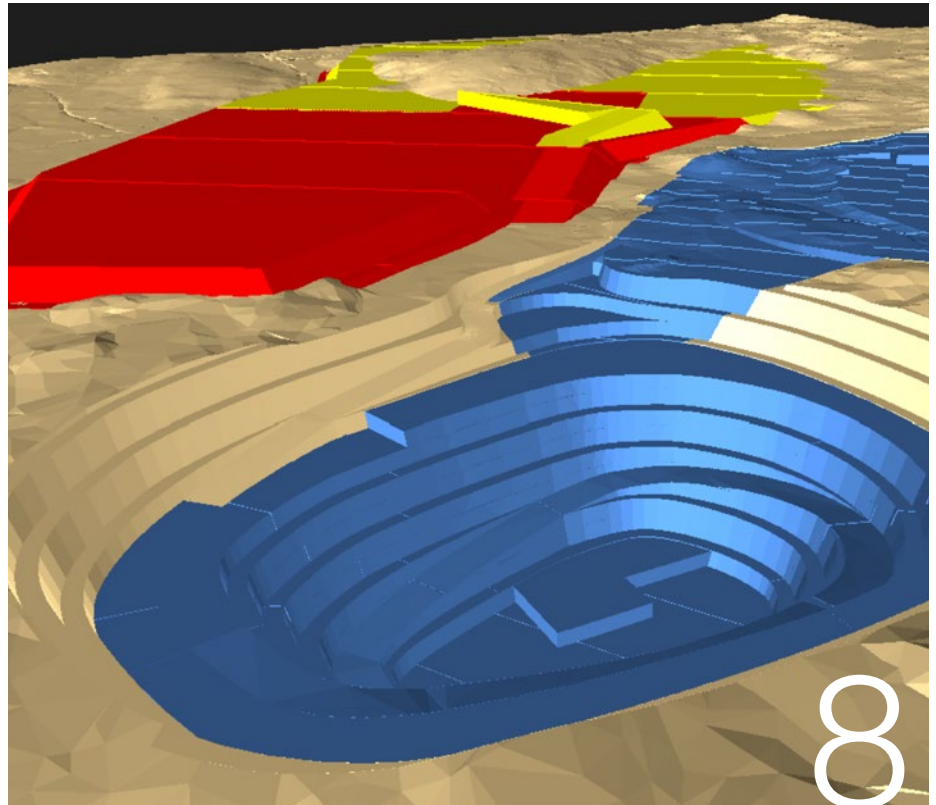
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# Dashboard delivers on data analytics

A coal mine in Queensland uses dynamic dashboards to display the latest drill and blast information to better inform planning, designs and scheduling.

Maptek™ mining technology expertise and industry partnerships have helped BMA Caval Ridge gain greater visibility around drill and blast across the operation.

The coal mine in Queensland's Bowen Basin is part of the 50:50 joint venture between BHP and Mitsubishi Development. BMA Caval Ridge achieved record annual production of 8.7Mt in FY2020.

Having used Maptek™ BlastLogic™ quality management system for more than 4 years, BMA was seeking to improve drill and blast processes at Caval Ridge.

MEC Mining Senior Mining Consultant Mark Killip identified a gap in data communication, and approached Maptek to create dynamic dashboards to display up-to-date drill and blast information in an easy to understand format.

The dashboard reporting solution is a one-stop-shop for all BlastLogic field data reconciliations, reports and comparisons with design, enabling the mine to drive operational and engineering improvements based on learnings.

Engineers, shotfirers and crew capture drill and blast information in the field using the BlastLogic Tablet.

Maptek worked with MEC Mining and Insight to ensure the right information was fed automatically from BlastLogic into a Microsoft Power BI dashboard. This provides engineers with a platform to learn from past blasts and improve planning, design and scheduling.

The alternative method involves hours of searching through blast folders, which is generally not possible in fast-paced production environments.

'The integrated and accessible data provides near-live information from the drill and blast teams, enabling superior decision making and leading to best quality blast outcomes,' Killip said.

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'Maptek technology is seriously game changing.'

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The solution is tailored to the site, serving the needs of engineers, operations crew and management. Contemporaneous Tablet field notes are displayed on the dashboard and extra comments can be added later.

The dashboard was up and running within weeks. It delivers a design against actuals comparison for a wide range of blast metrics, with pie charts and spatial plots of holes coloured by dipping, backfilling, charging and wet hole information.

Leveraging BlastLogic's SQL data warehouse provides access to years of information at the click of a button. This is otherwise archived on paper, and often stored off site. With Power BI the dashboard can be made available on all devices.

Insight specialises in harnessing the power of data to optimise industry operations, and immediately recognised there was a key requirement to bridge the gap between BMA and the logic behind the dashboard.

'Insight and Maptek's collaboration was a critical element in the overall success of the solution. Our technical consultants were able to leverage the industry specific drill and blast expertise of Maptek's team to deploy an asset that provides valuable data that shortens the client's time-to-insight,' said Insight Data and AI Practice Lead, Haim Ozchakir.

The next challenge was to produce a sustainable solution that could be used by the entire mine site.

'Visualising a dashboard is only one part of a very complex equation. The main challenge was building a solution that helps drive the business forward by providing meaningful insights to key stakeholders,' Ozchakir added.

Strategic Account Manager at Insight, Michael Lewis believes the project has created an appetite to further explore the business impact of analytics, and Power BI in particular.

'It's about speed to data, time-to-insight, and being able to accurately plan the next step with more information, more variables, and in the context that the people on the mine site need,' Lewis said.

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'Having access to timely information opens up opportunities for businesses to leverage machine learning and analytics to streamline and improve key operational processes.'

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The Power BI dashboard solution has been well received. The next phase of the project will provide near-live information to operational crews to track the progress of drilling and loading activities, continuing to grow value from the investment in analytics.

*Thanks to  
BMA, MEC Mining and Insight*





Senior Mining Consultant MEC Mining, Mark Killip shares the benefits of Power BI and working with Maptek and Insight.

Maptek technology is game changing. Their integrated and accessible data delivers near live information from the drill and blast teams, enabling superior decision-making and leading to best quality blast outcomes.

The addition of dashboard functionality further increases access to this data, allowing continuous improvement processes to occur efficiently and consistently.

*What's the experience of people using the Power BI dashboard?*

Accessing the history of a blast area on a mine site is critical in building the latest and fullest information. But it can be a cumbersome and time-consuming process, with the very real likelihood of missing important information.

The Power BI dashboard is a dream to use. It gives immediate, fingertip access to all historical blasting data. The capacity to scrutinise multiple blasts and cross reference for trends and outliers really enhances the user experience and enables the drill and blast engineers to fully focus their time and energy on delivering the highest quality blast designs.

*How does it make the people feel about their job?*

Ask any drill and blast engineer what drives them, and they'll universally agree that the most rewarding part of their work is creating best-scenario blast design and management for their customers. However, the essential but time-consuming preparation for this stage entails trawling through job packs, spreadsheets and manual blast lookups.

Maptek technology gives fast access to this information, allowing engineers to focus on the parts of the job that are more valuable to the customer and more enjoyable for them. This is where you want your drill and blast engineers to spend their time; fully armed with the data, they are motivated and ready to use their time delivering creative, cost-effective solutions.

*How does the dashboard help with organisational goals?*

Mine sites are awash with historical information but unless it is used productively it is merely clutter. The process of continuous

improvement needs excellent data, easily accessed and in a format that adds value to drive sustainable progressive change.

The Power BI dashboard, with its rapid access capacity, has the potential to save hundreds of design hours a year while giving insight into every blast that has ever been documented on site. It enables engineers to easily spot patterns and identify trends.

Picking up one trend alone can add enormous value to the mining process through better blasting; this dashboard allows you to identify almost all of them.

*What has it been like working with Maptek?*

The Maptek team delivers the technology, and they are highly professional, passionate about mining and excel at what they do. Their collaborative approach means working with them is a pleasure.

Leveraging Maptek's software expertise has enabled me to consistently deliver high quality drill and blast solutions to our mutual clients.

# Accounting for unplanned events

When a recent cloud service outage affected Maptek™ customers, technical services sprang into action to ensure everyone could continue working on key projects.

## Working anywhere

Customers have been experiencing the advantages of Maptek™ Account licensing since 2019. They have embraced the working from anywhere model that matches business conditions and supports adaptable staffing arrangements.

Shandong Gold transitioned to a fully Maptek Account organisation in late 2020. Standardisation across their geographically dispersed business benefitted more than 550 users at 30 operations. The gold miner can view and manage software usage within its user base, with improved transparency around reporting and tracking support cases.

In 2021 a team of North American geologists visiting their Western Australian operations was unable to leave when COVID restrictions were introduced. Maptek arranged easy access to the necessary licences to continue key modelling tasks.

A large international mining services provider switched to Maptek Account in 2021 to access shared regional licensing. Fail-safe licensing for intermittent internet connectivity and borrowing facilities for working offline were other advantages.

Maptek Account allows licence administrators to create user groups to borrow licences for limited timeframes or for longer periods based on the nature of their work.

## Working any time

On December 7, 2021 an 8-hour outage by Amazon Web Services (AWS) began at UTC 3.30pm and impacted cloud and other internet services globally. Customers who lost access to Maptek software were quickly restored through the global online licensing offered by Maptek Account.

The Maptek operations team in Adelaide, South Australia became aware of the issue almost immediately thanks to our automated monitoring systems.

Within 15 minutes of the AWS outage, customer software was redirected automatically to a mirror of the Maptek Account service. After redirection had occurred the majority of Maptek Account users could use their software, essentially unaffected by the outage.

Some components of the system such as the sign-in page of the Maptek Workbench took longer to switch over to the mirror. This prevented some users from signing in to their Maptek Account using the Workbench. For these users it took about 2 hours before normal service was restored.

By UTC 11.30pm on the same day Maptek engineers were confident that the AWS infrastructure had recovered, and that all of our customers were experiencing normal service.

## Troubleshooting

A few customers reported issues that appeared to be caused by local DNS caching, quickly resolved by rebooting the user's computer.

Other customers were concerned about the number of online products affected and potential impact to Maptek Account after the initial outage.

Borrowing licences for offline use guaranteed they could keep using their software despite the ongoing situation with Maptek Account and AWS. This provided peace of mind.

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Borrowing a licence for a day through Maptek Account was a good solution to intermittent network access.

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Normal customer support conduits were maintained during the outage. Within Maptek, email and Slack channels were the primary methods for critical messaging. Slack had recently been implemented across Maptek globally, and when put to the test, performed well for frequent widespread updates to staff.

More customers are finding that Maptek Account meets their needs for flexible, secure application licensing. Product download–update services and technical support streamline user experience with Maptek applications.

## Working for everyone

Maptek™ Account supports working from anywhere at any time, with borrowing and failsafe options for working offline. It removes the need for dongles or licence files which can become lost or are difficult to transfer between operations and sites.

With Maptek Account, users can download software updates, register for beta testing and submit and track their support cases. Administrators can view and manage software licences to meet the organisation's requirements and priorities.

# Changing the way mining is done

In 2022 Maptek™ releases an enhanced ideology to provide a clear view of our purpose and beliefs, and the principles that guide them.

In 2021 Maptek™ turned 40, and we naturally looked at our past and dreamt of the future. We reflected on our successes and the things we could have done better, differently or not at all.

How has a small geological database services provider grown to a global technology business with more than 20,000 users spanning the globe?

While 40 is by no means old, we have stayed young by continually refreshing our ideas, the way we work, and technology we use.

Fresh recruits work alongside long-term experts, cross-pollinating creativity, knowledge and wisdom.

Maptek was founded to serve the software needs of the mining industry and we thrive on that challenge. Our service-driven staff listen to site problems and collaborate with customers and partners to find creative solutions.

Our software has evolved from a collection of tools, to a comprehensive toolbox, to an application set that has no bounds – if it can be imagined, it can be created. We partner with other experts to develop complementary technology tailored for mining.

Customers must be flexible within their operational workspace, and they expect industry technology providers to foresee their needs and be there ahead of them.

Our 5-year plan is scaffolded by an enhanced ideology that explains who we are and what we stand for. If our purpose is clear the path will be straighter.

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Our purpose is clear – to change forever the way mining is done.

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Maptek believes integrated decision-making support systems are the best way we can help miners make better decisions.

We will encourage new thinking and support change.

We will listen to our customers and reinforce relationships.

We will work together and draw on each other's strengths.

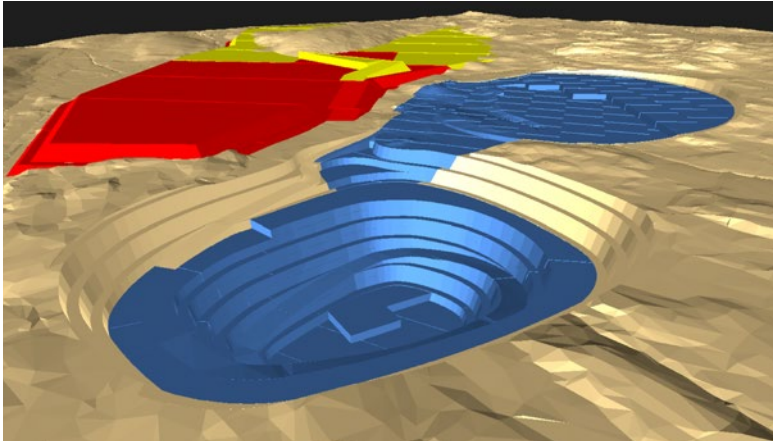
We will dream, brainstorm and turn complex ideas into simple solutions.

We will be accountable for how we work, and we will never give up.



# Environmental impacts of mining

Optimised scheduling combines with full life cycle analysis to quantify and reduce the environmental impacts of planned mines and monitor those in production.



Global demand for renewable and clean energy is increasing exponentially. Many green energy solutions are mineral intensive, and the transition to electric vehicles will require around 4 times more minerals than fossil fuel cars.

The mining industry is critical to the drive towards a low carbon global economy, and is central to the greening and decarbonisation of energy and transportation.

The International Energy Agency expects production of key minerals such as lithium and nickel to rise by more than 30 times by 2030 to meet demand. The mining industry is party to the growing need to apply data science, modelling and scenario planning to enable more agile decision making.

## Technology collaboration

Maptek™ is well aware of the risks and challenges associated with mining. Collaborating with other industry experts allows us to draw on a wider range of technological capability to develop targeted solutions to mining concerns.

Faced with the challenge of measuring, predicting and

quantifying the environmental footprint of an operation, Maptek contacted Minviro, whose mission is to ensure that raw materials for the low-carbon economy are produced with minimal impact.

Maptek and Minviro have combined their technologies to enable mining companies to develop multiple optimised material movement scenarios, each of which can be run through an environmental impact life cycle analysis.

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This process provides a solution to minimise an operation's environmental impact while simultaneously optimising the material movement schedule.

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Through his PhD project, Minviro Founder Dr Rob Pell recognised that, unlike other industries, the mining industry was rarely using life cycle analysis to understand its environmental impacts.

'Too often, environmental impacts are assessed after the damage has been done. Minviro is providing the opportunity to consider life cycle analysis right from the planning stage,' said Pell.

Minviro's technology, MineLCA can be employed to predict a project's environmental footprint as it develops, or it can be used in real time in a producing mine to monitor daily environmental performance. Developers can demonstrate the sustainability of their project to key stakeholders.

Operators can incorporate life cycle analysis into environmental, sustainability and corporate governance reporting around daily or weekly material and energy consumption and project impacts.

The challenge is to optimise mine planning, with its many, often conflicting constraints and objectives, together with environmental impacts.

This is where Maptek™ Evolution software comes in, targeting the competing factors to develop valid optimised schedules.

Evolution draws on powerful genetic algorithms and cloud computing. This combination increases the capacity of engineers to evaluate multiple scenarios and consider further downstream studies such as environmental life cycle analysis.



## The process

A resource block model is generated in Maptek™ Vulcan™ from drillhole data and is used to delineate geological domains. Grade is estimated from mineral assay logs in the drillhole data.

The mining engineer incorporates data such as economic value and proposed destination into the blocks. Data from the resource block model is combined with Vulcan pit and dump designs, and haulage routes for scheduling.

Evolution software calculates the movement of the blocks from in-situ location to final destination waste dump, stockpile or crusher, incorporating all the vehicle usage, material movement, blast consumable usage and crusher feed parameters.

The engineer can experiment with different designs and haul routes, or alternative approaches to material movement, such as conveyors for some or all of the route.

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Results are easily understood through graphically rich dashboards. Engineers can clearly visualise where material has come from and where it has been sent.

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Every aspect of the mine planning and scheduling value chain refers back to the resource model data. Evolution can process multiple variables to deliver valid schedules along with on-the-fly haulage.

'Evolution allows engineers to spend more time generating schedule alternatives, so downstream specialists can use the information to consider other performance metrics,' said Maptek Mining Engineer Scott Britton.

## Innovative approach

To test the innovative approach, real world mining data was modified to represent a generic open pit mining operation.

Britton generated several mine plan scenarios including extraction, haulage and waste dumping processes. The scenarios also test fundamental alternatives, such as the sequence with which the waste dump is formed along with alternative waste dump formation strategies that minimise above ground dumping of mine waste.

Other alternatives consider the impact of profiling waste dumps to their final rehabilitation shapes in order to minimise the disturbed ground footprint and reduce the double handling of materials, allowing stripped soils to be laid directly on prepared areas.

Engineers can consider a raft of scenarios, from alternative explosives for blasting, to fleet alternatives, to relatively minor adjustments to the dumping plan, and quantify the results.

Each scenario is optimised and the published schedule is passed to Minviro via Evolution's schedule sharing API, which enables integration to third party applications.

Once an Evolution schedule is generated, customers upload it to the cloud service, making it available for authenticated users to download.

The API provides all of the information from the schedule, enabling third parties to analyse the data. Each completed scenario is exported from Evolution to the API for consumption by Minviro's MineLCA software.

The Minviro team undertakes a detailed life cycle analysis on each scenario, on a range of environmental impact categories, that can include global warming potential, acidification and water use. They can also inform the customer on strategies, new technologies and alternative approaches that can help reduce their overall environmental footprint.

## Conclusions

Operations today are interested in a range of environmental impacts besides global warming and CO<sub>2</sub>.

'Every project has different energy requirements, chemical use, fossil fuel consumption and water use, before region-specific factors like water scarcity or electricity grid mixes come into play,' Pell said.

'It's not enough to limit impacts at the mine face alone – miners must consider their whole supply chain, with emphasis placed on the most sustainable sources.'

Minviro will continue to seek to quantify and reduce environmental impacts, and MineLCA is a powerful tool for looking at the entire mining process to identify hotspots.

Maptek sees its role in the future of mining as providing innovative technology to make data driven decisions enabling smarter mining. Giving our customers the power to process their data and seamlessly integrate with dynamic innovators like Minviro is a significant step in improving sustainability across the mining industry.

*Thanks to  
Minviro*

# Digital rethinking

Digitalisation has changed the way drill and blast is perceived at one of Africa's largest coal mines, leading to better recovery and improved safety.

Maptek™ BlastLogic™ has helped Exxaro's Grootegeluk Mine revolutionise its approach to drill and blast by providing a better understanding of its processes.

Located in the Limpopo province of South Africa, the mine employs 3200 people and produces 26Mtpa final coal products using a conventional truck and shovel operation. It has an estimated mineable coal reserve of 3261Mt and a total measured coal resource of 4719Mt, from which various coal products are derived.

Because of the scale and structure of the operation, Grootegeluk Mine runs dedicated project teams that trial and assess new technology and methods before they are potentially adopted across the entire site by the production team.

## Digitalisation

BlastLogic was introduced in 2019 as part of the mine's drive towards digitalisation, and due to its success in transforming drill and blast methods is now being deployed in production.

BlastLogic is an advanced drill and blast reconciliation solution that does more than fit into existing systems and processes.

The ability to guide data collection, management and analysis workflows provides a new framework for drill and blast at Grootegeluk Mine. Access to a single source of truth helps teams to better understand the mine status in real time and facilitates ongoing improvement.

Before implementation of BlastLogic, the operation did not have a dedicated QA/QC team and was yet to settle on a preferred drill navigation system. The initial targets for the project team were to improve drill navigation through greater ability to visualise drilling compliance, and integration with smart trucks.

BlastLogic exceeded expectations on both fronts. Grootegeluk Mine had never been able to undertake drillhole validation in real time to see how the as-built holes were complying to design. A direct interface between BlastLogic and drill navigation systems allows automated live import of as-built drillhole data for analysis.

BlastLogic drill validation tools automatically retrieve data, which lets engineers take full advantage of as-drilled information. As well as providing reports of how holes compare to design, BlastLogic is able to flag calibration errors and functionality issues on the drill navigation system. This information prompted the mine to upgrade their drill navigation system.

## MWD data

Using Epiroc with BlastLogic facilitates the use of Measurement While Drilling (MWD) data – detailed quality and density information can be quickly derived from geological and production drilling. The deposit is massive, and benches are made up of different coal densities. It is important to track these variations.

Engineers must take into account geological structures such as faults and dolerite intrusions when planning drill and blast activities.

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Better geological knowledge helps mitigate potential dilution and leads to improved safety.

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The BlastLogic Tablet, which dynamically updates drill and blast plans in the field, can also communicate directly with Enaex IBIS smart truck systems used on site to control explosives loading.

The intuitive tablet is simple to learn and work with, and the integration eliminates manual data entry – saving time, preserving data integrity and increasing safety for operators.

BlastLogic fits into the site-wide initiative to track the start and finish times of the entire mining process by providing OData system timestamps. Drill and blast elements, QA/QC, charging processes and firing data are automatically tracked.

Adopting the new system has helped underscore the value of drill and blast engineers. Dedicated staff to analyse drill compliance to pattern design as well as powder factor of the explosive and charge rules help lay the foundation for continued improvement through learning from the feedback loop.

Across the operation BlastLogic has reduced the need for manual data entry and eliminated the associated errors, ensuring that higher fidelity data is available more quickly to identify and preempt potential issues.



## Safety

From a safety perspective, the engineers are excited about BlastLogic flyrock modelling, which can predict the potential extent of displacement and determine blast exclusion zones based on model inputs. This knowledge will potentially lead to fewer interruptions, less downtime when equipment needs to be moved and enable reconciliation initiatives to commence earlier.

Fragmentation modelling is also of great interest to help improve dig rates, crusher throughput and general efficiency in the mine to mill process. Engineers are keen to see BlastLogic provide fragmentation scenarios for different blocks based on changes in burden, spacing and powder factor.

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Digitalisation has changed the way drill and blast is perceived at Grootegeluk.

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Providing a simple improvement platform for high level short interval controls and dashboard reporting of live operating environments is one of the most important enablers for ongoing success.

## Working together

Grootegeluk Mining Engineer Peter Magagane worked with the Maptek implementation team and commented that they were very supportive and the training was well understood by the end-users.

Record-keeping, drill and charge validation, floor projection and fragmentation prediction were highlighted as being most beneficial for the operation.

'The solution has provided a safe and reliable record keeping feature for drill plans, drilling data and explosives usage data. This assists with regular in-depth reconciliation,' said Magagane.

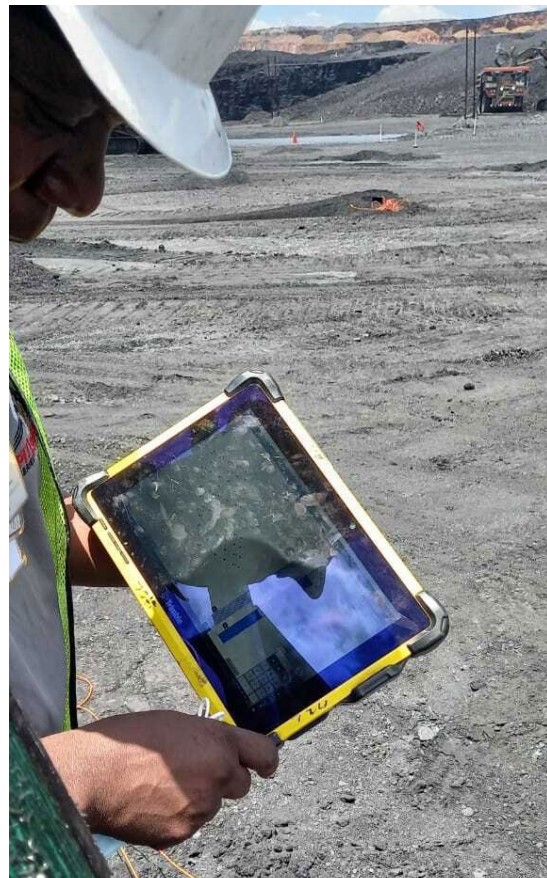
'The drill validation process helped to ensure that a detailed comparison of the planned and actual drilled data is achieved in an efficient manner, especially since the pit comprises multiple benches.'

'The system helps us achieve the desired fragmentation by proposing the amount of explosives and powder factor required per drill block, saving costs. The automated charging process was quickly learnt by the operators and it also improved their safety,' concluded Magagane.

Feedback will help Maptek refine the BlastLogic system for the site. Change management is always a challenge when implementing new processes so it is important to have a plan to address this. Improved integration with third party drilling solutions is on the wish list.

The operation aims to use the BlastLogic system to further cut drilling and blasting costs, improve the quality control process and provide auditable records of all drill and blast activities.

*Thanks to  
Peter Magagane  
Mining Engineer  
Exxaro Grootegeluk Mine*



# Maptek MaterialMRT real time tracking

Maptek™ can help deliver a better understanding of production performance across load and haul, stockpiling and plant processes.

Maptek™ MaterialMRT provides the mechanism for mines to identify, remediate and optimise current discontinuous material flows from in situ rock to run-of-mine (ROM) stockpiles through to the plant.

Traditional material tracking involves siloed systems, decisions based on assumptions and a lack of connection to the resource model. This can lead to low confidence in inventory composition, poor yield, poor value recovery and sub-optimal plant performance.

MaterialMRT connects the resource model, mine plan, fleet management, on-belt analysers, survey, laboratory and plant feed. Operations gain a validated, accurate and up-to-date view of the movement and quality of mined material and product throughout the value chain.

This solution features a cloud centralised server, web-based user interface and database components to measure, store and display real time geospatial data on material quality and quantity.

MaterialMRT helps operations understand material movement in real time, instilling confidence that stock levels are accurate, and provides a reliable framework to guide planning and scheduling.

MaterialMRT traces each parcel of material directly fed into the plant, or to and from a stockpile, and dynamically displays the changes to the ROM pad as material is dumped and reclaimed over time. This provides a working model of variable composition stockpiles with both quality and tonnage information.

Importantly MaterialMRT references actual composition of material quality from the resource model, not merely weighted averages.

Operations can interrogate MaterialMRT reports for the length of time material has been on a stockpile and the number of times it has been rehandled before arrival at the plant for processing.

Invariably raw data from fleet management contains errors or exceptions, such as when a sensor is faulty or down. With MaterialMRT, data can be easily adjusted to account for changes, and an audit trail links back to the raw values relevant to tonnage and grade.

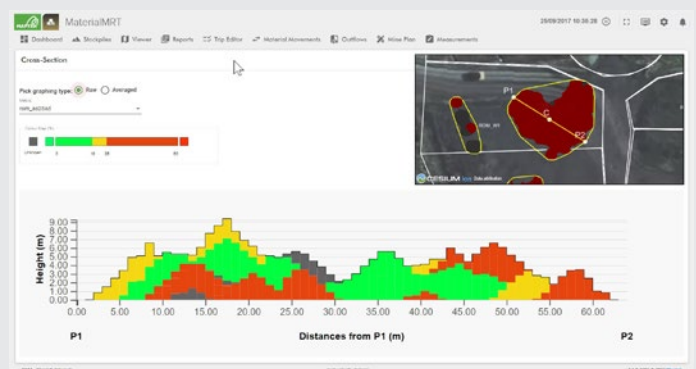
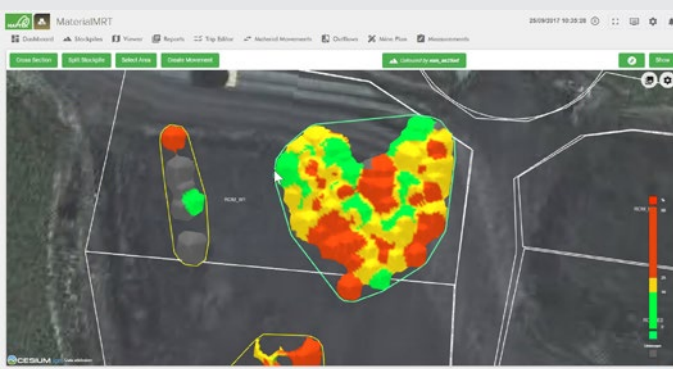
Live dashboards and reports deliver a single source of truth; presenting one view of the entire mine value chain makes it easy to see where processes are less than optimal and allows trends to be easily identified.

Using MaterialMRT overcomes the challenges of tracking material movements from pit to plant and reconciling delivery against resource modelling.

Functional stakeholders and management on site or in the corporate office can quantify the variability of material quality and quantity at each stage.

## Benefits

- > Designed for purpose – low training overhead and minimal deployment requirements
- > Productivity gains – manage the number and location of ROM stockpiles to improve plant utilisation
- > Dump stockpile compliance – know which trucks are dumping on which stockpiles while preserving source block data
- > Maximise yield through the plant – improve the quality of ROM stockpiles through live spatial tracking of product quantity and quality
- > Resource model reconciliation – track material through the ROM, allowing reconciliation with the resource model and strategic mine plan





# Maptek rewards innovation

Maptek™ supports technological innovation in mining through industry awards, and promotes opportunities for university graduates and interns.

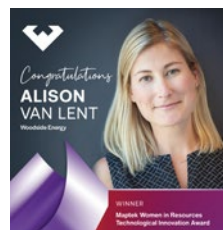
## Working smarter

Alison van Lent won the 2021 Maptek™ Women in Resources Technological Innovation Award for her work on FUSE, a sophisticated 4D digital twin platform created by the Intelligent Assets team at Woodside Energy. FUSE supports remote operations, providing one digital space to operate.

The software solution is used by operators, maintenance staff, engineers and others in a range of business processes to support safe and reliable operations. It allows early identification that equipment needs maintenance and automates the scheduling of that work. The data also helps Woodside optimise plant performance.

'A key capability of FUSE is to make things work harder so we can work smarter – it allows us to transfer information gathering, repetitive tasks and processes to the platform and free people to focus on decision making and other higher value cognitive problems,' said van Lent.

'One of the value propositions is the ability to get data quickly into a single place by deploying our in-house engineered Internet of Things (IoT) sensors to fill in the gaps so we can automate certain tasks and enable better decision making.'



Van Lent was honoured to receive the award, and highlighted the importance of young women seeing that there are many interesting jobs in new and innovative fields that are becoming integral to the mining technology sector.

'To me, innovation means taking a risk and putting in the effort to try something new and unique even when you know it might not work.'

Van Lent emphasised that flexible parental leave policies (as Woodside provides), combined with supportive colleagues and partners, can really assist women to better plan out their career paths.

The Maptek Award was presented by the Minerals Council of Australia.

Maptek CEO Eduardo Coloma said it was an honour to recognise women at the forefront of innovation in the resources industry.

'At Maptek we value people and partnerships, and this award helps celebrate the success of individuals who push the envelope,' he said.

## Interns skill up

Getting to know programming languages in depth, being exposed to new code bases and creating code in a supported manner stood out to the latest group of Maptek™ summer interns.

Six interns, who between them study Computer Science, Maths and Software Engineering, held roles across different Maptek teams in Adelaide for 10 weeks.

This latest program saw two interns coding in our experimentation team, where they applied more relaxed software principles to prototype new technology and innovate in an industry setting.

Maptek internships are mutually beneficial. Students gain real-world experience and an opportunity to see how they can apply their studies to industry problems. They find confidence knowing their code will appear in the software customers use every day.



Jash Vira (Vulcan GeologyCore), Cindy Seuk (Experimentation), Nathan Shepherd (Workbench), Harkaranveer Singh (Evolution), Anthony Seager (Experimentation) and Jared Gibson (Workbench)

Maptek gains insight into the next round of graduates and potential employees, and many interns later secure positions with the company.

# Advanced geostatistics training

Maptek™ invests in the next generation of resource modellers, and helps technical staff polish their skills by regularly hosting advanced geostatistical training.

## Geostatistical methods

Maptek™ invests in helping the next generation of resource modellers, partnering with Dr Clayton Deutsch, Professor and Director of the School of Mining and Petroleum Engineering, Department of Civil and Environmental Engineering at the University of Alberta.

For several decades Dr Deutsch has been teaching and conducting research around the geostatistical methods applied to resource estimation and grade control.

In a long-standing partnership, Maptek hosts the sessions and provides Maptek™ Vulcan™ software and technical support throughout the course, which explores theoretical and practical aspects of applied geostatistics.

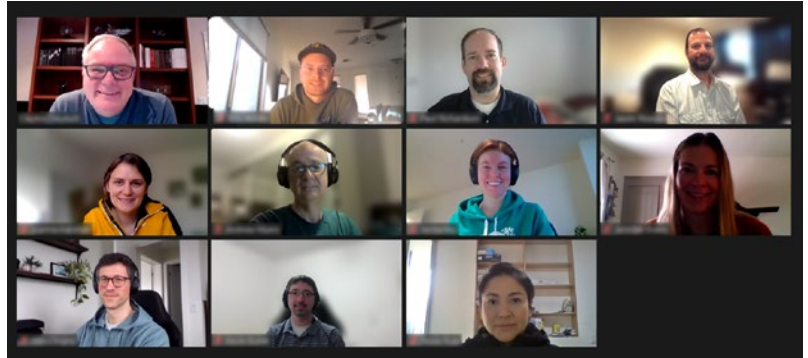
The 2021-22 four-week courses were fully remote and attracted 35 students. Maptek and Dr Deutsch worked together prior, during and after each session to explore ways to cultivate an engaging interactive virtual learning environment.

The Maptek team is eager to continue offering professional development opportunities for technical staff to explore practical applications of geostatistical theory to challenging industry problems.

Due to increased interest the course was hosted by North America twice in 2021, and other regions will also be hosting in 2022.

## Practical insights

Paul Richardson, Senior Geologist in Maptek North America and Andrew Myers, Chief Software Engineer in Maptek Australia were able to participate in the course from opposite sides of the globe.



We asked them for feedback on the course, considering their different backgrounds.

*Why is it important for Maptek staff to take part?*

'We offer our customers tools to do their work. It's also important to learn these tools ourselves so we can support them. The industry is continually evolving and we need to evolve with it,' said Richardson.

Myers echoed the importance of understanding what's happening under the hood of the software.

'I don't have a geology background, but have been around Maptek long enough to pick up the basics. As I get more involved with DomainMCF I need to be able to frame it within the geostatistics world that people are familiar with,' said Myers.

'Learning from a teacher who has written books on the topic was so much better than attempting to learn from a book in my spare time, and trying to fit it between other tasks. And in my case, taking lectures at 2am was the ultimate distraction free environment.'

*Did you learn anything surprising?*

'Even though I have been a resource geologist for many years, there's a lot I don't know and many tools that can help me be better at what I do,' commented Richardson.

'I now appreciate the work involved in preparing a grade model in terms of the number of decisions, the checking, the alternatives to explore and all the rules of thumb that come with experience,' added Myers.

'It was also surprising to learn that although techniques such as kriging have been around for 50 years, more modern approaches using simulation have evolved during the time I've been at Maptek.'

*How does that make you feel about the jobs our customers need to do?*

'As leaders in mining software, it's our job to help customers utilise the right tools for their individual needs. Firstly, we need to understand what they want to accomplish, and then propose tools and workflows to help them succeed,' said Richardson.

'As Maptek commercialises new geology tools using new techniques it's important to be able to explain them in context. I now have a new set of data analysis tools to objectively measure how well the machine learning systems work and to improve the modelling to give the desired results,' said Myers.

'With my programmer hat on, I now appreciate the effort that goes into our Vulcan tools to make sure they perform as expected in a wide range of tasks,' concluded Myers.



# Vale John Mossop, McGill University

Maptek™ honours McGill University engineering educator with a donation to the university, and graduates over the years share their memories.

## John William Mossop

The mining community lost a brilliant educator, mentor and friend with the passing of John William Mossop in 2021. His legacy lives on in McGill University students.

Maptek™ Engineer Delphine Quach was one such student who benefitted from his teaching, advice and generosity. She encouraged Maptek to honour Mossop for his unique contribution to the mining community, the university and his many students.

In response, a Maptek laser scanner was donated to the mining engineering department at McGill, for use in the field and classroom to give students real-world survey and geotechnical experience.

Students will also have access to Maptek™ PointStudio™ software to process and analyse their point cloud data using the powerful geotechnical tools.

Maptek training sessions planned for 2022 with McGill mining engineering students will focus on getting the best results from these technologies.

Quach and the Maptek team hope this donation in Mossop's honour will be a valuable learning tool for the current and future mining engineering students.

Several McGill graduates shared memories of their mentor.

Sean Grogan recalled how Mossop advocated for him during a difficult transition to university.



*Rodrigo Villarreal, Delphine Quach and Professor Mustafa Kumral with the donated Maptek laser scanner*

'I went on to do a masters and am in the middle of a PhD. If not for John, I would not have had the confidence to pursue a doctorate. I hope that someday I can advocate for someone the way John did for me.'

Doina Priscu and Caius Priscu shared memories of Mossop as a great lecturer and an avid volunteer.

'Mining games, non-profit organisations, you name it, John volunteered. And who can forget working hard with him for the CIM Annual Conference in the mid 90s in Montreal, with over 5000 participants? Today, we still cherish his efforts, by sharing and giving back ourselves to the community that embraces us.'





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