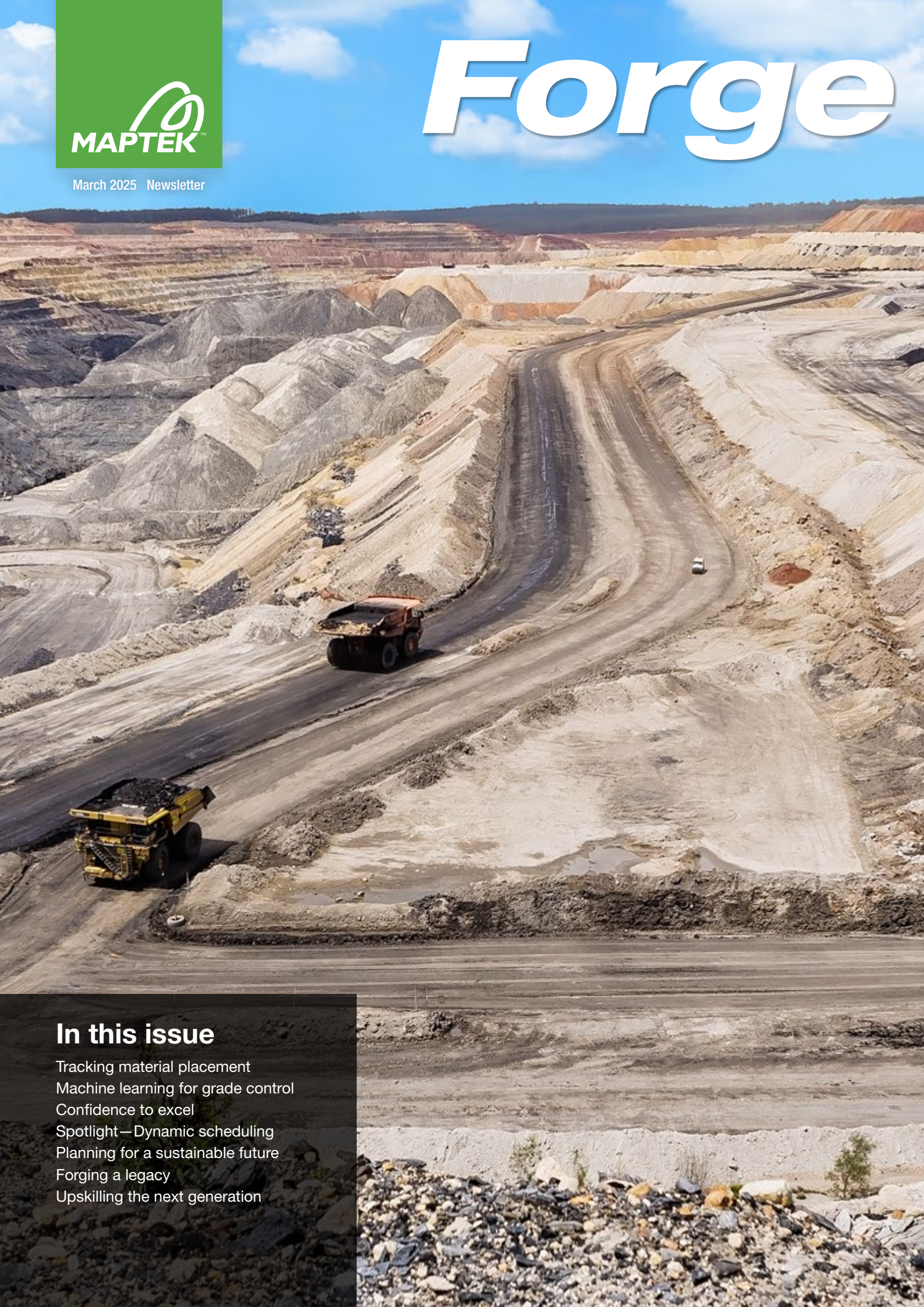
Forge

MAPTEK™

March 2025 Newsletter



In this issue

Welcome to our Forge newsletter March 2025

In this issue, we explore a diverse range of advancements and initiatives driving innovation.

At the Stanwell Meandu mine, Maptek real-time material tracking is helping ensure compliance with critical requirements.

We also dive into a grade control study using the DomainMCF machine learning engine, which holds promise for a haematite and magnetite deposit in Whyalla, South Australia.

Additionally, we highlight how Maptek Evolution adopts a future-proofing approach with dynamic modelling and cutting tools for efficient mine planning.

Thinking ahead, we outline how Maptek is developing technology solutions to address the evolving complexity faced by mining businesses.

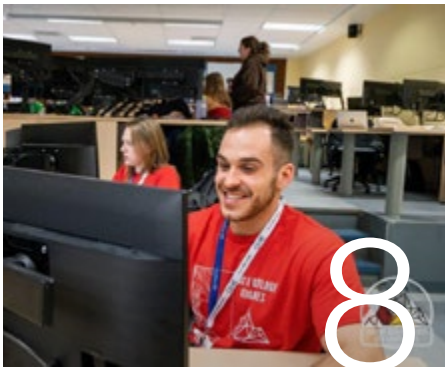
Maptek's commitment to fostering future talent is evident through our support of geology undergraduates across Canada in the Geology Games, where students applied their knowledge to real-world scenarios.

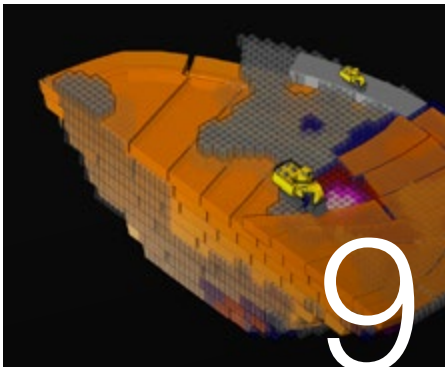
We also feature university students in Adelaide benefiting from industry relevant projects, helping uncover new solutions and approaches to solving difficult computational problems.

Lastly, we take a moment to celebrate three decades of the Forge newsletter, reflecting on how customers have shared their practical experience using our products to answer daily real world challenges.

Eduardo Coloma
CEO

Contact us: forge@maptek.com





Material tracking supports Meandu to place waste, rejects and subsoil in the correct locations for rehabilitation

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Tracking material placement

Stanwell Meandu mine is implementing Maptek near real-time material tracking to monitor and report on coal, waste and rejects placement to achieve compliance.

Meandu Mine is 25 km southeast of Kingaroy in southern Queensland. BUMA Australia operates the mine as contractor to TEC Coal, a subsidiary of government-owned Stanwell Corporation.

Meandu Mine was established to deliver coal solely to Tarong power stations, via a 1.5 km overland conveyor line, with the power stations only taking deliveries from Meandu. The Tarong power stations are among Australia's most efficient, and together supply around 20% of Queensland's energy needs. Tarong and Meandu celebrated 40 years of continuous operation in 2024.

BUMA provides a complete pit-to-product coal service to Stanwell, operating under stringent safety and environmental conditions. Meandu open cut strip mine currently has four working pits. Overburden is removed with a large dragline, and four excavator and truck fleets. Coal is mined from three gently dipping seams varying in thickness from 2m to 20m, with two principal seams at 30m and 60m depth.

Meandu has progressively rehabilitated land since the start of operations in the early 1980s. This has enabled the active mining area to be minimised, and the mine can be effectively returned to post mining use at any time.

The standard achieved and success of rehabilitation to return mined land to native open eucalypt woodland, similar to the adjoining Tarong State Forest, is widely recognised in the industry and by regulators.

Stanwell's Meandu Progressive Rehabilitation and Closure Plan (PRCP) was approved by government in January 2024. Following extensive community consultation, the dominant eucalypt woodland rehabilitation has been supplemented with beef cattle grazing and water storage to create a final landform sympathetic to the surrounding land uses.

Part of the PRCP approval includes specific material type placements within specific spatial areas within specific timeframes in the waste dumps and selective placement of subsoil and topsoil types, providing for safe, stable, non-polluting and sustainable landforms that support the intended land use.

Meandu has invested in Maptek™ MaterialMRT to track placement into waste dumps, truck load by truck load, with reference to material characteristics of each load, enabling response to out of horizon waste placements. The interrogative reporting tool allows monitoring of final landform construction to design and demonstration of compliance.

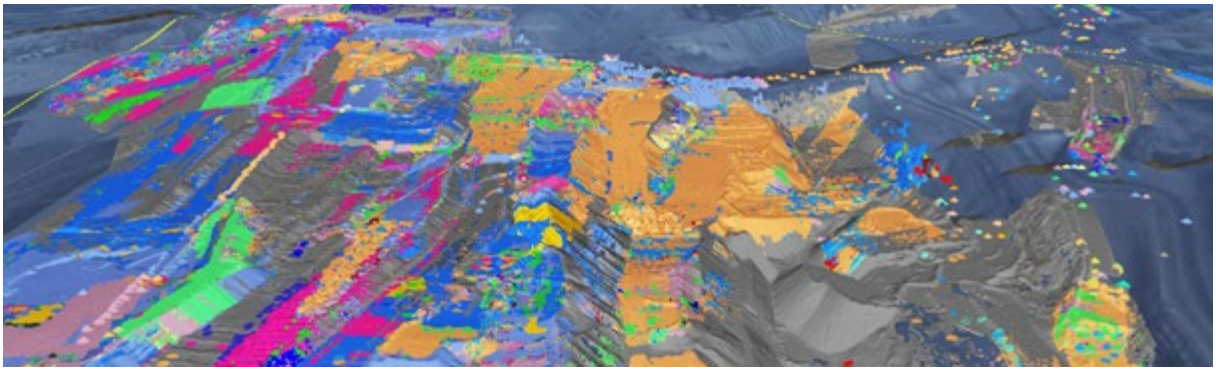
While Meandu has an existing Fleet Management System (FMS), it does not provide for the extent of tracking, modelling and more complete data capture and tagging on a truck load by truck load basis.

The current site process involves operational dump designs with waste selectively placed in respective stockpiles. The FMS tracks and records the source and dump locations of every load. Waste dumps are surveyed as part of the month-end process.

Production data is checked by the BUMA Technical Services team. Manual validation of weekly FMS data and actual survey against approved designs is prone to error and extremely time consuming. Before MaterialMRT was deployed, additional technical and administrative resources were required for manual tracking, reconciliation and reporting.

Real-time waste tracking

MaterialMRT is new cloud native software to automatically manage and track material movements in mining operations. The solution incorporates material classification, modelling of material flows and accurate real-time tracking from source through to stockpiles and dump location.



Visual reporting through MaterialMRT enables Meandu to monitor compliance

Material properties are accurately tracked so encapsulation within defined bounds can be ensured to meet compliance objectives for Environmental Authority (EA) and PRCP rehabilitation commitments.

MaterialMRT enables 3D visibility and interrogation of variable material composition within constructed dumps and stockpiles. It increases inventory and material composition accuracy, and links these back to their origin to measure performance and compliance.

The system provides material inventory transparency and sharing of material classification information between mine planning, mine operations, processing and logistics models and actual operations data. It also integrates with other systems for sourcing production data, as well as reporting and reconciliation.

> MaterialMRT provides an automated, streamlined solution with a significantly less time-consuming and labour-intensive process.

The system delivers greater visibility of waste dump construction and ROM coal stockpiles through 3D modelling and quality aggregation of dumped material, with properties sourced from the resource model attributed to every truck trip.

Transparency in close to real time in the recording and reporting process will assist in demonstrating compliance and interrogation by the regulator and independent auditor in ad hoc and routine 3-yearly PRCP audits. Minimising rehandling through improved material allocation compliance leads to reduced costs compared with a labour-intensive manual process.

MaterialMRT helps ensure that potentially acid forming material is placed appropriately and minimum requisite capping requirements as defined in the EA and PRCP are achieved. Coal quality management is improved by allocating coal quality parameters instead of a weighted average material type, tracking of ROM stockpile dumping and withdrawals, and determining quality variation across stockpiles to plan for ROM coal blending and CHPP batch processing.

Maptek worked with Meandu to identify operational challenges and constraints, and collaborated with various stakeholders to ensure that the new system is accepted widely by the user group. Maptek improved MaterialMRT capability, enabling the operations team to track material for every truck load to respective stockpiles while sourcing the attributes from the resource model. This helps the Stanwell team monitor compliance and ensure material placement requirements can be met, as committed in the PRCP.

'Maptek has made the application more user friendly. This also helps Maptek develop practical features and functionality for wider industry use,' said Karthik Nadarajan, Senior Mining Engineer, Stanwell.

MaterialMRT automatically pulls spatial data from the FMS and material classification from the resource model. This system serves as a single source for modelling and monitoring waste and coal material placement, and inventory reporting on qualities of associated stockpiles.

'While we are advancing the roll-out to the wider Mining Operations team, the application has reporting functionalities and features that will benefit various stakeholders in their day to day tasks,' said Nadarajan.

Progressive rehabilitation returns land to open forest, grazing and water storage

Environmental and Technical Services teams will benefit from early in-shift warnings of incorrect material placement MaterialMRT reports have been used to query plant rejects placement and identify an incorrect placement. This allowed the Mine Operations team to fix identified problem areas early.

Maptek has worked with Stanwell since day one, and through new challenges along the way. They have developed an application that will remain competitive and advantageous to evolving industry requirements,' added Nadarajan.

The biggest value driver is visual reporting of material placement in stockpiles in close to real time, and querying material properties.

MaterialMRT addresses an industry wide challenge—tracking near-live data and modelling as-built dump shapes using resource model attributes. Meandu is one site already seeing the advantages. Further value will be realised when other available features, such as lab data integration, mine schedule compliance tracking, coal quality management and stockpile quality management are rolled out.

Thanks to
Karthikeyan Nadarajan
Senior Mining Engineer
Stanwell Corporation

Machine learning for grade control

A study of a haematite and magnetite deposit submitted for the Maptek™ Geology Challenge found that machine learning holds promise for grade control.

SIMEC Mining produces iron ore from active operations in the Middleback Ranges, about 50 km west of Whyalla in South Australia. Mineralisation occurs predominantly as haematite and magnetite hosted in large-scale banded iron formations. These rocks are complexly folded by at least three major deformation events and are intruded by multiple phases of mafic–intermediate dykes and granite intrusions.

Prompted to enter the Maptek™ Geology Challenge, SIMEC Geology Superintendent Ed Lynch was interested in the opportunity to test Maptek DomainMCF on these highly complex structures. The annual Geology Challenge inspires geologists to engage with new approaches and redefine the boundaries of geological modelling.

DomainMCF uses machine learning to rapidly produce domained block models—an objective and repeatable approach potentially saving significant time and cost. Lynch set up various scenarios using both real and simulated grade control drilling data to test DomainMCF and assess possibilities for improving current modelling and grade control practices. One of these scenarios is discussed here.

Magnetite domains

For magnetite grade control, 6m composite samples taken at an approximate 10m x 20m spacing are analysed by Davis Tube Recovery (DTR) to ascertain recoverable metal and associated concentrate grades. Material is segregated based on the DTR results—primarily mass recovery, proportion of silica in the concentrate product, and proportion of sulphur in the original sample.

There is strong geological control on these material classifications as they correlate to stratigraphic units, with cut-off criteria determined through extensive lithogeochemical classification. These material categories form the basis for the domains used as inputs to the DomainMCF modelling process.

To validate the accuracy of the DomainMCF models, block models were developed independently through existing grade control practices, using manual interpretation and grade estimation by ordinary kriging methods.

Those block models produced during ongoing operations are considered the closest possible representation of actual domain volumes realised during mining and so were used as benchmarks to reconcile against and assess the accuracy of DomainMCF models.

Multi-bench grade control

Lynch considered three recently mined benches with 1601 magnetite grade control samples. Two DomainMCF models were produced using the same machine trained on sample data domained based on magnetite grade control cut-offs.

One model had block dimensions half the sample spacing and length (5m x 10m x 3m) and another had the same block dimensions used in the grade control model (25m x 25m x 4m) with sub-blocking enabled to one-quarter of the parent block dimensions at domain boundaries. The second model was run using the previously trained machine to test for repeatability.

> Each model was completed within a total compute time of approximately two minutes.

The models were validated visually against the input samples. The resultant models run at different block sizes using the same machine produced identical domain volumes.

The DomainMCF models produced at smaller block sizes demonstrated a more geological appearance by removing polygonal or jagged edges without impacting the general trends and volumes of modelled domains.

Lynch concluded that there is no apparent drawback to using smaller blocks apart from longer computation times. Given the efficiency of DomainMCF compared to traditional modelling methods, computation times even at smaller block sizes are not a concern.

Accuracy of the DomainMCF models was assessed largely by reconciling the domain volumes against the volumes of like domains in grade control models. In this case total ore volumes modelled by DomainMCF differed by only 2.1% from actual grade control models.

This demonstrates that DomainMCF can be successfully applied to drilling data at resolutions typical of wider spaced reverse circulation drilling grade control programs and could replace or supplement current methods.

Validation

While the DomainMCF process removes the subjectivity of human geological interpretation, the validation stage requires geologists with suitable expertise to determine whether the model satisfactorily represents all of the available data and underlying geology.

For example, SIMEC mine geologists isolate material containing sulphur, which is considered a deleterious element. Although only 1.3% of the total volume, it is important in the grade control model. In this case, relatively very few samples of this material were available, leading to misleading results.

> Models informed by a larger number of samples at tighter spacings were generally more representative of the input data and reconciled more closely to grade control.

Spatially the multi-bench models closely represent the input data in both plan and section views with the differences in volumes produced by DomainMCF compared to the actual grade control not visually obvious.

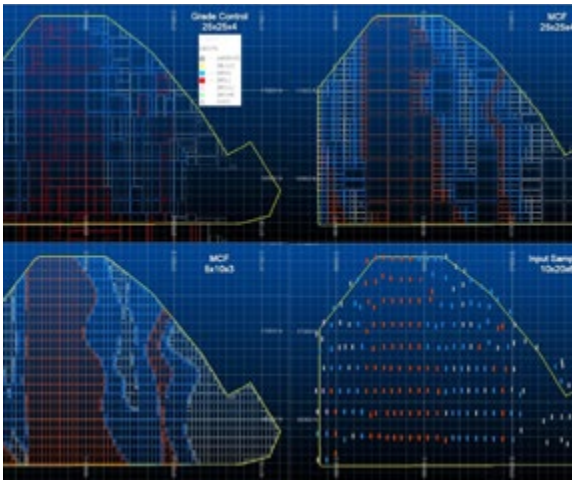
Conclusion

This study demonstrated that DomainMCF can efficiently produce domained models that represent the input data to an acceptable level of accuracy for grade control.

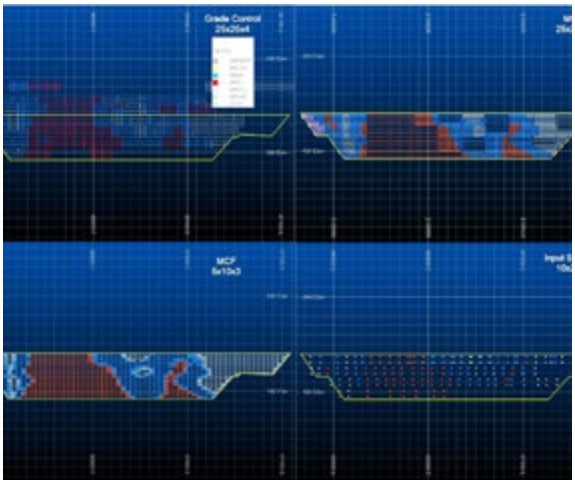
Models are repeatable and produced in a fraction of the time through traditional methods—minutes and hours rather than days or months.

DomainMCF presents a valuable tool that can drive improvements and efficiency in grade control processes which then feed into mine planning and operational decision making

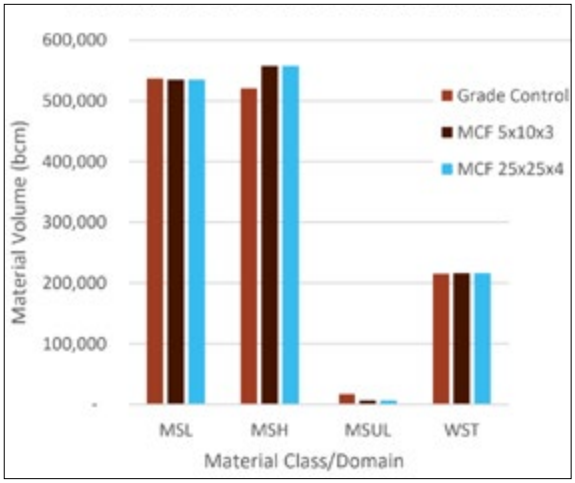
Thanks to
Ed Lynch, Geology Superintendent
Matthew Peacock, Chief Geologist
Colin Badenhorst, Principal Resource Geologist
SIMEC Mining



Plan view slice through Grade Control and DomainMCF models compared against input sample points



Section view slice facing north—Grade Control and DomainMCF models compared against input sample points



Volume comparison for domains modelled across three mining benches during Grade Control and using DomainMCF, where MSL refers to low silica magnetite, MSH = high silica, MSUL = sulphur, and WST = waste material classifications

Confidence to excel

Geology students across Canada competed to apply their academic knowledge to real-world scenarios during the recent Geology Games.

Maptek™ was gold sponsor for the 2025 Geology Games, a multi-day event held in Quebec during January for geology students from across Canada. The goal was to provide participants with an opportunity to apply academic knowledge to practical real-world scenarios while exploring technologies and concepts beyond their regular curriculum.

This year's competition saw the participation of eight prestigious institutions: Université Laval, University of Ottawa, Université du Québec à Montréal, Queen's University, Polytechnique Montréal, McMaster University, Université du Québec à Chicoutimi, University of Waterloo, and University of Toronto.

With 30 students competing in the Maptek-based challenge, the event fostered a vibrant atmosphere for learning and networking.

> The competition aimed to mimic the challenges students may encounter in their professional careers.

Participants reviewed the data provided, developed geological and resource models, and delivered investment recommendations for further exploration.

They were graded across important technical and professional competencies, including initial data review, geological model interpretation, grade estimation, resource classification, reserve calculations, and the clarity of their observations and recommendations.

Teamwork, professional conduct, and the ability to tackle complex challenges under strict time constraints were also key evaluation criteria.

Maptek involvement, under the leadership of Maureen Moore, Geoscience Manager North America, included provision of software tools and designing a realistic scenario to evaluate a project.

Moore played a key role in developing the competition and mentoring participants through the geological modelling processes, helping them connect academic knowledge with industry expectations.

Reflecting on the event, Moore found participating in the Geo Games incredibly rewarding.

'I was truly impressed by the enthusiasm, adaptability, and collaboration the students demonstrated while tackling complex challenges,' Moore said.

'I also want to acknowledge the contributions of the student volunteers, who ensured that participants and visiting professionals felt welcomed and supported throughout the event. They played a key role in fostering the inclusive and professional atmosphere that made the Games such a success,' she said.

Events like the 2025 Geology Games highlight the critical importance of experiential learning in geoscience education. Maptek is honoured to assist in equipping future industry professionals with the skills and confidence to excel.

Evolving a dynamic scheduling system

Maptek™ leverages future-proofing technologies to ensure the Evolution scheduling solution continues to address industry needs.

Mine scheduling is a continuous iterative process. Maptek™ Evolution provides a suite of solutions to meet the demands of each scheduling horizon.

Inputs for long range plans are often well defined and iteratively analysed to determine the optimal NPV for multiple scenarios. Evolution Strategy provides valuable insights to drive the highest NPV given the operational constraints at the long range horizon.

Evolution Origin provides greater granularity, with functionality for handling material blending and haulage evaluation for long and mid range plans.

Short range and tactical scheduling challenges engineers with frequent updates and changing inputs or parameters. Evolution Epoch has been built to manage these shifting priorities.

Features in the Evolution 2025 release are targeted to manage the ever changing short range planning environment. Dynamic Solids will bring two key enhancements to Epoch, unlocking access to source data and improving interactive sequencing workflows.

Dynamic solids

Dynamic Solids models bring users closer to their data. These models combine both source block model and solid triangulation model types to reduce the number of steps for scheduling model preparation.

Integration with Maptek™ Vulcan™ block models and triangulation files provides direct access to spatially relevant schedule solids and current production model attribute values. This hybrid model reduces the effort required to initialise schedules and provides improved resolution throughout the scheduling process.

With more connected data sources, mine engineers can spend less time preparing scheduling models and more time evaluating scenarios. Another benefit of Dynamic Solids is the faster response to continuously changing production models for short range planning. These changes can be reflected in a schedule setup without needing to update the model outside Epoch.

Solids cutting

The key to unlocking the flexibility of the dynamic solids modelling is the new cutting tools in the release anticipated for March 2025.

Featuring tighter integration with schedule input models, Dynamic Solid Cutting provides several tools that allow users to interactively cut schedule solids to satisfy the requirements of the short range plan. Through either target seeking or direct cuts, the mine engineer is in complete control of the progression of the mining sequence.

Target-seeking cuts can be configured to accumulate material totals for production oriented shapes, or direct cuts can be made to accommodate specific requirements or one-off cut shapes.

The combination of dynamic solids modelling and cutting produces almost instantaneous user feedback in terms of cut quantities and grades for their mine sequence. These tools enable the mine engineer to iterate in real time to rapidly gain insight into various mine schedule results.

Future-ready technology

The iterative nature of mine scheduling is accepted by mine engineers. The new functionality in Evolution Epoch provides a better connection and more rapid data feedback to enable end users to make better decisions.

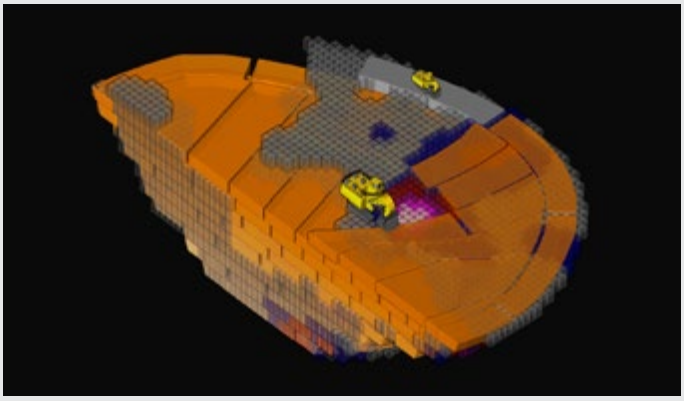
> Instead of spending days preparing different planning models, Evolution users can invest time into understanding how different sequences can meet the operational requirements of their site.

Model preparation and scheduling can now be completed in a single workflow in Evolution Epoch rather than transitioning between packages for each new scenario.

Maptek reviewed the Epoch workflow alongside the dynamic solids features for the 2025 release. New setup level controls allow users to enable or disable functionality based on scheduling requirements. This greatly reduces the number of user-defined inputs necessary to move from model setup to schedule results.

Dynamic Solids and the simplified navigation will be available in Evolution 2025 within the Epoch Module. Existing subscribers and new customers will have access to these exciting tools, with no new subscriptions or module purchases necessary.

Maptek recommends customers upgrade to Evolution 2025 as soon as it is available to take advantage of the enhancements.



Planning for a sustainable future

Maptek™ CEO Eduardo Coloma outlines how technology solutions are being developed to help tackle the complex issues facing mining businesses.

All industry sectors will inevitably continue to experience new and often disruptive challenges. Mining is no exception.

A growing skills gap and declining interest in mining careers will push the industry to find new ways to capture and retain knowledge while identifying processes that can be automated.

Digitalisation must evolve beyond data collection and transformation into automation and orchestration, making full use of every data point to improve efficiency and decision making.

Integrating orebody knowledge with operational data is key to deriving continuous value. This shift will disrupt workflows, requiring a move from a deterministic to a probabilistic approach.

The industry continues to build new resources on fixed assumptions, without accounting for the range of possible outcomes. This can lead to missed opportunities and inefficiencies, given that resources are inherently variable and uncertain.

Maptek™ meets challenges head-on with software that is integrated and adaptable, ensuring that data and critical insights are available to anyone at any time, anywhere.

A multi-objective optimisation framework allows trade-offs between competing objectives, revealing ambiguities, ensuring robust planning and decision making in the face of increasing uncertainty and complexity.

Remaining relevant

Mines generate vast amounts of valuable data at every stage—exploration, design, operations, processing and rehabilitation—but much of it remains siloed, underutilised, or inaccessible for critical business decisions.

Resource depletion and variability, regulatory pressure, workforce shortages, and the need for greater efficiency add complexity. One of the most pressing issues is data fragmentation across the mining value chain.

Maptek is uniquely positioned to address this, with a portfolio of integrated solutions spanning the entire mining lifecycle. Unlike point solutions that focus on isolated processes, the Maptek ecosystem connects data sources, providing a unified view of operations.

Maptek Vestrex is a new platform anchored by three pillars hosting data services, cloud computing and orchestration. Automated data pipelines allow multiple processes to execute in parallel.

This truly data-driven paradigm maximises the usefulness of data, improves operational efficiency, and promotes confidence in decisions.

> Interoperability of data and systems enables customers to move beyond reactive decision making and toward a more predictive approach.

Enhanced collaboration fosters alignment across technical and business objectives. When mine planning, design, scheduling and monitoring data flows seamlessly into operational and financial decision making, miners can expect continuous improvement.

Bridging the gap between technical insights and strategic business decisions breaks down data silos and improves access, empowering mining companies to optimise operations, reduce risk, and create resilient, future-ready businesses. This is a key differentiator.

Emerging technologies

A flexible, data-driven approach better reflects real-world conditions and optimises decision making, according to Maptek CEO, Eduardo Coloma.

'Maptek has been leveraging AI since 2014, when we introduced evolutionary algorithms in our scheduling solution,' Coloma said.

'Hundreds of scenarios are run simultaneously, enabling the system to learn from each iteration and present a range of high quality solutions. Higher quality mine schedules are delivered in a fraction of the time compared to traditional optimisation methods.'

The time-consuming process of geological domaining was another obvious candidate for AI, where deep learning neural networks rapidly classify and model orebodies. Orebody models that estimate multiple numeric variables and associated uncertainties are available in hours or minutes, a task that previously took weeks using conventional implicit modelling.

'Presenting geologists with more alternatives faster, triggering data-driven insights, represents the future of orebody modelling,' Coloma said.

An exciting project exploring the use of large language models (LLMs) to enhance online help and customer learning experience will provide faster, more intuitive access to product knowledge. This reduces the learning curve, enhances user adoption, and ensures that customers can leverage Maptek technology more effectively.

'Expanding AI-driven capabilities across the whole mining operation helps our customers unlock new levels of efficiency, accuracy and optimisation, delivering tangible benefits,' Coloma said.

Investment is key

Maptek remains competitive and innovative by continuously investing in people, technology and strategic partnerships.

'We celebrate our growth from a small geological consulting firm in 1981 into a global mining technology leader. Our entrepreneurial spirit remains intact,' Coloma added.

> A culture of curiosity and continuous learning has led to advances that keep Maptek at the forefront of innovation.

'We encourage staff to explore new ideas and allocate time to experiment. Embracing the best technologies ensures that we stay ahead.'

'Investing in infrastructure to leverage cloud computing and artificial intelligence allows us to develop scalable, data-driven solutions that optimise mining operations,' Coloma concluded.

Maptek ensures products and services remain relevant through strong customer and industry relationships, partnering with companies that share a vision for the mining future. Collaboration with like-minded organisations ensures that mining technology drives progress and shapes a sustainable industry.

Forging a legacy

A retrospective on Maptek™ Forge newsletter celebrates 30 years of subscribers sharing and reading about mining problems and solutions.

Over the past three decades, the Maptek™ Forge newsletter has served as an essential platform for showcasing the transformative impact of Maptek technologies on the global resource industry.

By publishing case studies across regions and applications, the newsletter has provided valuable insights into how Maptek solutions have addressed complex issues, optimised operations and driven innovation across the mining sector.

> The case studies featured in Forge span a vast array of operations, from small-scale projects to large, multi-national mining companies, across different resources including coal, gold, copper, iron ore and diamonds.

Articles showcase customer applications in exploration, mine planning, resource modelling and operations management.

Early on, many success stories highlighted the role of our flagship Vulcan™ software in helping geologists and engineers model, visualise and evaluate geological data.

The accuracy and user-friendly capabilities of Vulcan have helped customers optimise their exploration efforts and improve decision making in mine planning

Maptek software has facilitated operational improvements at every stage of the mining process. Mine design and scheduling tools enhance efficiency, reduce downtime and improve safety. As new software and hardware products were developed, the focus expanded to spatial survey benefits.

Forge introduced our I-Site™ laser scanning hardware and software to the survey market nearly 25 years ago. Sentry monitoring and PointStudio™ software have led to improved point cloud data collection and modelling.

Real-time data monitoring and modelling solutions streamline workflows, leading to more effective use of resources, timely design conformance and better planning or long-term profitability.

Customers have shared how our Evolution scheduling solutions have enhanced their operational planning, and BlastLogic™ drill and blast management tools work in the production environment.

Forge covers how technological advancements in 3D modelling, automation and artificial intelligence (AI) are reshaping the future of mining. Case studies highlight the significant progress in areas such as orchestrated workflows, remote data collection and machine learning for predictive maintenance.

Several have demonstrated how data-driven systems are improving the safety and efficiency of mining operations by reducing human error and automating data pipelines.

The adoption of AI and machine learning in DomainMCF has been central to successful outcomes alongside GeologyCore. These technologies help miners model vast amounts of geological and assay data to build reliable, accurate resource models.

Other applications include how operational data is analysed to predict and mitigate risks, optimise processes and improve overall performance.

For example, AI-powered analysis has helped customers in the diamond mining sector enhance their recovery processes, maximising yield while minimising waste.

The global scope of Forge reflects the widespread adoption of Maptek technologies.

From the Americas to Africa, Europe, Australia and Asia, Maptek solutions have been instrumental in transforming mining operations worldwide.

Many stories focus on how Maptek tools are used in difficult environments, whether navigating complex geology in remote areas or tracking material movement in real time to meet environmental regulations.

Forge highlights the impact of technology in helping mines improve operational efficiency, create jobs for local communities and contribute to regional economic growth. Through customer collaboration, Maptek demonstrates a commitment to providing sustainable solutions to mining challenges.

As the Editor looking back over 30 years of Forge, it is satisfying to reflect on how it offers a remarkable snapshot of the ongoing evolution of mining technology. The breadth and depth of the success stories underscore the integral role Maptek innovations play in shaping the future of mining.

By continuing to push the boundaries of technology, Maptek will remain a trusted partner to mining companies around the world, driving progress for years to come.

Thank you to everyone who has supported Forge by subscribing to our newsletter and contributing case studies. If you are interested in being part of my final Forge before I retire in June, please reach out.

Jane Ball
Forge Editor 1996-2025

forge@maptek.com

Upskilling the next generation

University students in Adelaide benefit from industry relevant projects and Maptek™ discovers new insights into difficult problems.

The University of Adelaide offers third year students in Computer Science and Electronic & Electrical Engineering a Software Engineering Project subject.

Companies are invited to set the projects, ensuring topics are industry relevant. Each student group can choose to enrol in the project that interests them the most. More than half of the 450 students enrolled in the Maptek™ projects in 2024.

Involvement in previous years has taught Maptek what makes for an ideal project that students find both engaging and challenging.

Engagement with higher education is an important pathway for Maptek's future development capability. A benefit for Maptek is meeting smart students and giving them a taste for the types of applications and algorithms we develop, which helps with attracting future employees.

Several of our experienced developers were first exposed to Maptek as students or recent graduates. A past winning entry has been incorporated into Maptek DomainMCF and will be part of Maptek Vestrex parallel performance experimentation this year.

Will Reid, Global Development Strategy Manager and Simon Ratcliffe, Head of Experimentation and Technology ran two projects in parallel for the first time in 2024. They needed to design the projects to keep multiple teams engaged across the semester while balancing team capabilities.

Two purpose-built components were required to manage the projects. The first was a cloud computing environment for running jobs, using learnings from the Maptek Evolution Cloud Service. The website sees an arbitrary Python or win64 executable provided by student teams run on a virtual machine within a testing framework. The machine can be selectively provisioned. The competition website displays a live leaderboard of team progress.

The second component was a set of Python scripts or executables to provide inputs and process outputs from the competition entries in the testing framework, scoring the entries as they are tested, to progressively challenge the teams with more difficult problems as the semester progresses.

This system runs and assesses student work 24/7 and easily scales to handle the high load of multiple teams competing for top spot on the leaderboard in the final hours before competition deadline. It also provides an easy mechanism for responding to student support requests.

Novel projects

One project required students to compete for speed and compression coalescing block models—a common requirement in Maptek Vulcan™ and DomainMCF. This popular competition was recycled from previous years with several enhancements.

The other project required students to compress a human voice audio stream such that it could still be understood. Low bandwidth radio communications such as LoRaWAN or some constrained underground radio systems can use novel algorithms to improve communications between equipment and the control room by reducing the amount of information that needs to be sent.

> Artificial intelligence techniques are bringing great gains to classical compression methods and it was exciting to see several teams adopt this route for their project success.

Both Maptek projects proved very popular. Over 4200 entries were processed, taking about 15,000 minutes of compute time during the semester.

Maptek acknowledged the innovation of students at the prize ceremony where the top students were invited to present their work.

Simon Ratcliffe introduces the Maptek projects to students at the University of Adelaide

Global events

www.*maptek*.com

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