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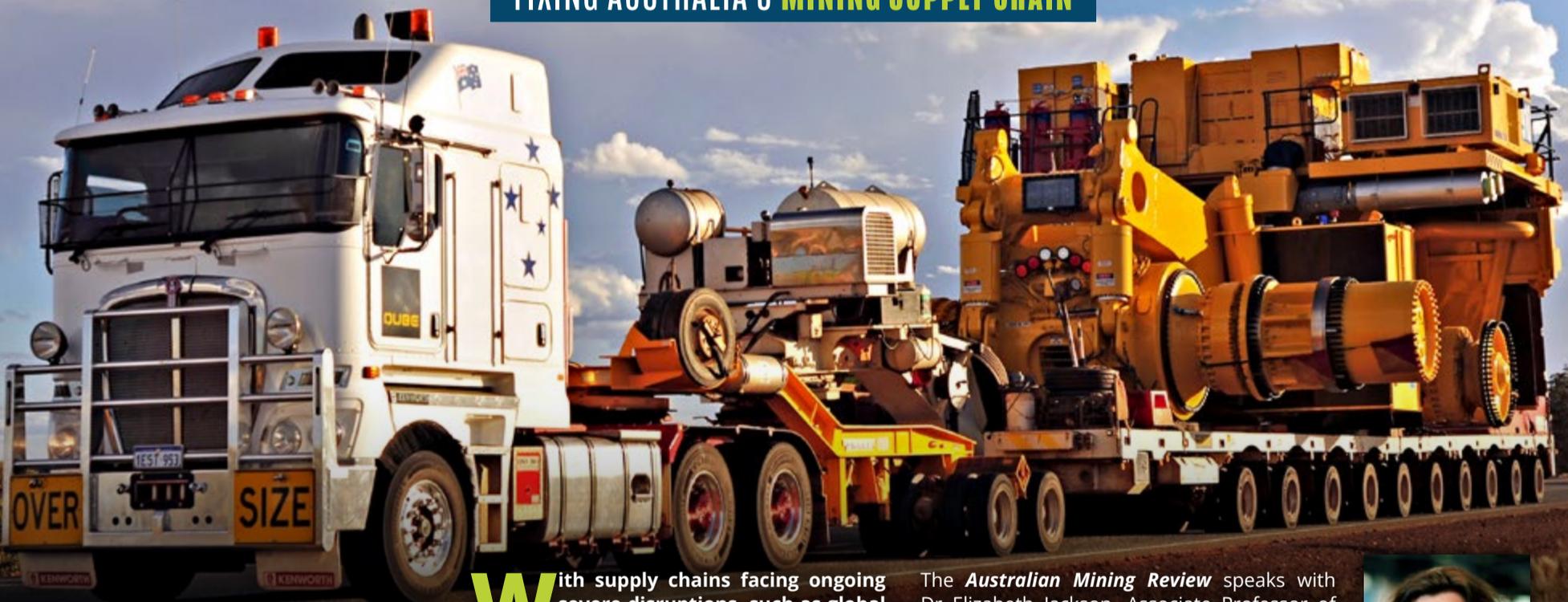
FUEL FARM SOLUTIONS

SEE PAGE 58



BROKEN LINKS

FIXING AUSTRALIA'S MINING SUPPLY CHAIN



With supply chains facing ongoing severe disruptions, such as global pandemics, climate events, floods, bushfires, hostility in the Red Sea, industrial action at shipping ports, ongoing military conflicts and more, the downstream effect on businesses, consumers and the global mining industry are significant.

The *Australian Mining Review* speaks with Dr Elizabeth Jackson, Associate Professor of Supply Chain Management at Curtin University, about the current state of global and Australian supply chains, including the big issues and big trends facing these complex logistics systems, as well as how they impact our mining sector.



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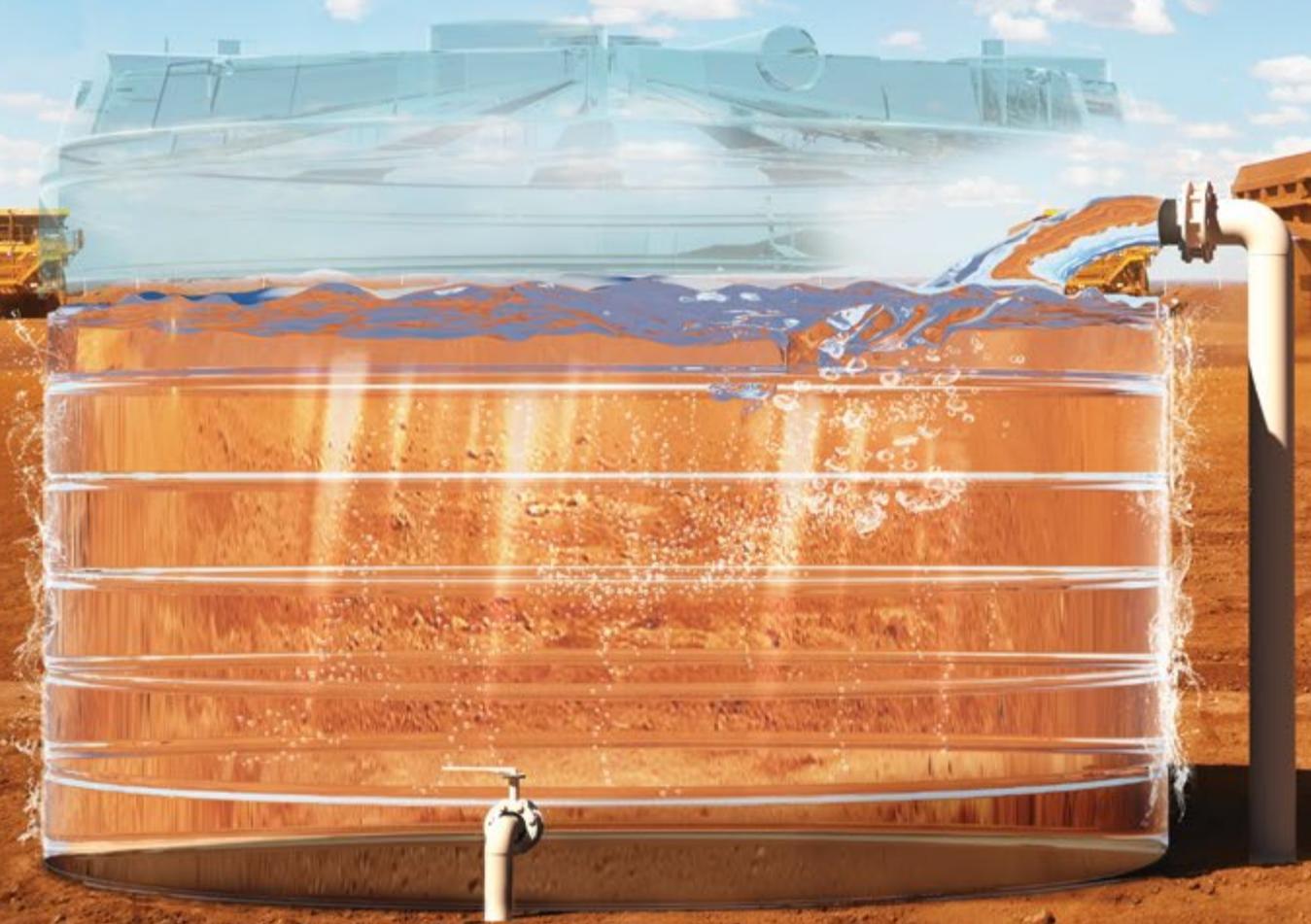
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WHOPPING \$16.1B SPEND ON AUSTRALIAN SUPPLIERS BY MINING GIANT



Rio Tinto (ASX: RIO) has spent more than \$16.1b with suppliers and local Australian businesses in CY23, an increase of 5% from CY22.

It was spent with more than 5,800 businesses, including Australian owned and operated businesses and locally owned and managed branches of global companies.

As part of the mining giant's ongoing

commitment to support communities where it operates, the spend has contributed to tens of thousands of Australian jobs and delivered a significant economic contribution to communities across the country.

Rio Tinto chief executive for Australia Kellie Parker says it is important for the company to assist the communities where it operates so that Rio Tinto can in turn have a long-term future.

"We're proud to have increased our spend with Australian Indigenous businesses by 29% to \$727m in CY23 and with local businesses around Australia by 25% to \$1.2b."

WA spend jumps almost 40%

Rio Tinto's spend in WA jumped almost 40% in CY23 from a year ago to \$8.8b.

The company worked with more than 2,400 suppliers, with \$875m going to local businesses near its operations around the State.

The company also increased spend with WA Indigenous businesses by 35% in CY23, compared to the year prior, reaching a record \$593m.

In the Pilbara, Rio Tinto spent \$835m with local businesses and, of this, \$499m was spent with Pilbara-based Indigenous businesses.

More than 80% of these businesses were Traditional Owner businesses.

Since 2018, Rio Tinto has increased its annual spend with suppliers in WA by 78%, as part of the company's ongoing

commitment to support the communities where it operates.

Monadelphous and Wesfarmers major category winners at Supplier Awards

Rio Tinto celebrated the contribution of its suppliers at its second Supplier Recognition Awards last night.

Attended by more than 700 people, the awards recognise the company's valued suppliers for their outstanding performance and the contribution they make to the company and the local community.

WA Premier Roger Cook attended the event and presented the WA Supplier of the Year award to Monadelphous, while Rio Tinto Iron Ore chief executive Simon Trott presented the Chief Executive Award to Wesfarmers.

Premier Cook says "[the WA] Government has put in place a range of initiatives to ramp up local content on government projects, and it is great to see major companies like Rio Tinto increasing their local spend". **AMR**



(Image source: Business Wire) (L-R) Wesfarmers managing director and chief executive Rob Scott (CEO Award winner), Rio Tinto Iron Ore chief executive Simon Trott, Monadelphous managing director Zoran Bebic (Supplier of the Year Award winner) and WA Premier Roger Cook.

"We strive to employ locally and buy locally in Australia - especially from Indigenous, small and regional businesses," she said.

"It's about providing opportunities to help these businesses grow and, in doing so, creating new jobs and training opportunities for many Australians, helping to support the nation's economy.

\$1B OLIVE DOWNS COAL MINE OFFICIALLY OPENS

Pembroke Resources' \$1b Olive Downs coal mine has officially opened in Queensland and a \$1m fund has been unveiled.

Located in the coal-rich Bowen Basin, Olive Downs includes major infrastructure including a coal handling and preparation plant, rail spur, train load-out facility, coal conveyor, stockpiles, electrical transmission lines, water pipeline and access roads.

More than 700 people were employed during construction of the project and an operational workforce is expected to peak at 1000 during production.

Pembroke Resources chairman and chief executive Barry Tudor says the company

is thrilled to have reached this milestone.

"We're thrilled to have achieved this significant milestone at the world's newest steel-making coal mine," he said.

"Our strategy remains centred on collaborating with stakeholders to establish sustainable and lasting economic prospects by generating jobs, economic diversification and providing direct support to the community, all while showcasing a fresh approach to environmental standards."

Olive Downs is expected to produce up to 15mtpa of steelmaking coal over the next 80 years and the coal will be transported by rail to the Dalrymple Bay Coal Terminal for export to Japan, South Korea and India.

To enhance social and community life around the mine, Pembroke also announced a \$1m Pembroke Community Partnership Program.

The program was created to ensure the local area continued to benefit from the opening of Olive Downs with funding being provided to projects identified, prioritised and supported by local residents.

"This is stage one of the fund, which will run over the next five years to help ensure the local community reaps the benefits of having the Olive Downs complex operating in their region," Mr Tudor said.

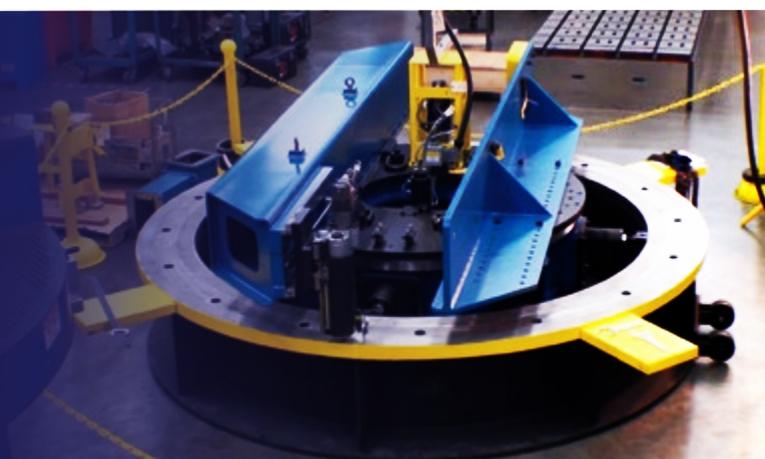
"Projects of interest could include those focused on improved health, welfare and

employment outcomes as well as improved social infrastructure.

"Another priority for us is reducing unnecessary red tape so it's as easy as possible for local to decide how and where this funding is spent for the future benefit of the community."

Alkane Resources (ASX: ALK) has also begun production at its Tomingley gold operations in NSW with the blasting of the first production stope at the Roswell orebody.

This stope is planned for 23,000t of ore at an average grade of 5.2g/t gold. Production from Roswell will continue to ramp up with the approval of relevant mine management plans. **AMR**



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FORTESCUE

OPENS GLADSTONE ELECTROLYSER FACILITY



Fortescue has opened its electrolyser facility in Queensland.

Fortescue (ASX: FMG) has opened its electrolyser facility in Queensland which is one of the first in the world to house an automated assembly line.

The 15,000m² manufacturing facility has the capacity to produce over 2GW of proton exchange membrane (PEM) electrolyser stacks per year.

Fortescue Energy chief executive Mark Hutchinson says the facility establishes the company as an original equipment manufacturer.

"The process of splitting hydrogen and oxygen isn't new – but the innovative ways the world is looking to use green hydrogen to decarbonise are, and that means demand for green hydrogen and for the electrolysers to produce it is growing rapidly," he said.

"The facility positions Fortescue and Gladstone as a large-scale producer of what will be an increasingly sought-after commodity in the global shift to green energy.

"We're strategically focussed on building out our energy business. Not only are we developing a pipeline of green energy project, we're also now designing and manufacturing the specialised equipment and technology that will underpin our green hydrogen projects and that of others."

The site was supported by the Queensland

Government and included the supply of an electrical sub-station, road network, local scheme water connection, communications and the allocation of land.

Furthermore, \$44m was contributed by the Federal Government from the collaboration scheme of the modern manufacturing initiative.

The electrolyser facility marks the first stage of a green energy manufacturing centre that Fortescue is developing. The next phase will include a hydrogen system testing facility and Fortescue's PEM50 green hydrogen project.

"We know that technology in this space moves very quickly so as well as producing

electrolysers today, this facility also provides an amazing environment for our team to learn and then leverage that experience to drive innovation and develop the solutions of tomorrow," Mr Hutchinson said.

GenusPlus wins \$50m of Fortescue contracts

As part of Fortescue's (ASX: FMG) decarbonisation plans, power and communications infrastructure provider GenusPlus Group (ASX: GNP) has been awarded two work contracts worth \$50m.

The two contracts are for the construction of civil foundation and the construction of a 220kV circuit overhead transmission line to transmit power between the

power station at Fortescue's Solomon and Eliwana mines in WA.

Under the contracts, GenusPlus will construct the pole civil foundations and install the transmission poles, conductor, optical ground wire and hardware. Work has already begun and is expected to be completed by mid-2025.

GenusPlus managing director David Riches welcomes the opportunity to extend the company's relationship with Fortescue.

"We are delighted to secure these contracts, which continue to build on our long and successful relationship with Fortescue; and they will play an important role in driving Fortescue's decarbonisation plan in WA," he said.

"Fortescue's award of further contracts is testament to the capability of our team – and welcome recognition that Genus has the capacity and expertise to support the continuing energy transition."

Fortescue is aiming to decarbonise its mining, port, rail, non-process infrastructure and mobile fleet in WA to achieve real zero emissions by 2030.

The company's decarbonisation plan includes the development of green power generation, which consists of renewable wind and solar energy generation and storage. **AMR**



(Image source: Fortescue) Fortescue's Solomon mine.

WESTGOLD & KARORA MERGER TO CREATE +400KOZPA GOLD PRODUCER



The merger will result in Westgold becoming a top five Australian gold producer.

Westgold Resources (ASX: WGX) and Karora Resources have agreed to combine and create a +400kozpa gold mining company.

Under the agreement, Westgold will acquire all Karora shares with Karora shareholders to receive 2.52 Westgold fully paid ordinary shares, 68¢ in cash and 0.30 of a share in a new company to be de-merged from Karora for every Karora share held.

Upon completion of the transaction, Westgold will have a portfolio of assets capable of producing more than 400kozpa exclusively from a WA asset base, high

quality exploration targets and a clear pipeline of growth projects.

Additionally, the company will become a top five Australian gold producer with a market cap of around \$2.2b.

Westgold managing director and chief executive Wayne Bramwell commented on the merger.

"The expanded business will have several large mines, be well funded, fully leveraged to the gold price and have optionality over an enviable selection of growth opportunities," he said.

"Importantly, the business will have expanded human and physical resources to extend mine lives and production scale rapidly."

Karora chairman and chief executive Paul Huet says the merger provides significant exposure to one of Australia's largest gold producers.

"With the combination of Westgold and Karora, we are taking the next step by combining two highly complementary, free cash flow generating asset bases in one of the world's finest mining jurisdictions to create a premier Western Australian mid-tier gold producer," he said.

"The prospects for the combined company are tremendous, with over 13moz in gold resources fuelling production of around 400kozpa and 3200km² of combined exploration tenements in Australia's most prospective gold mining regions."

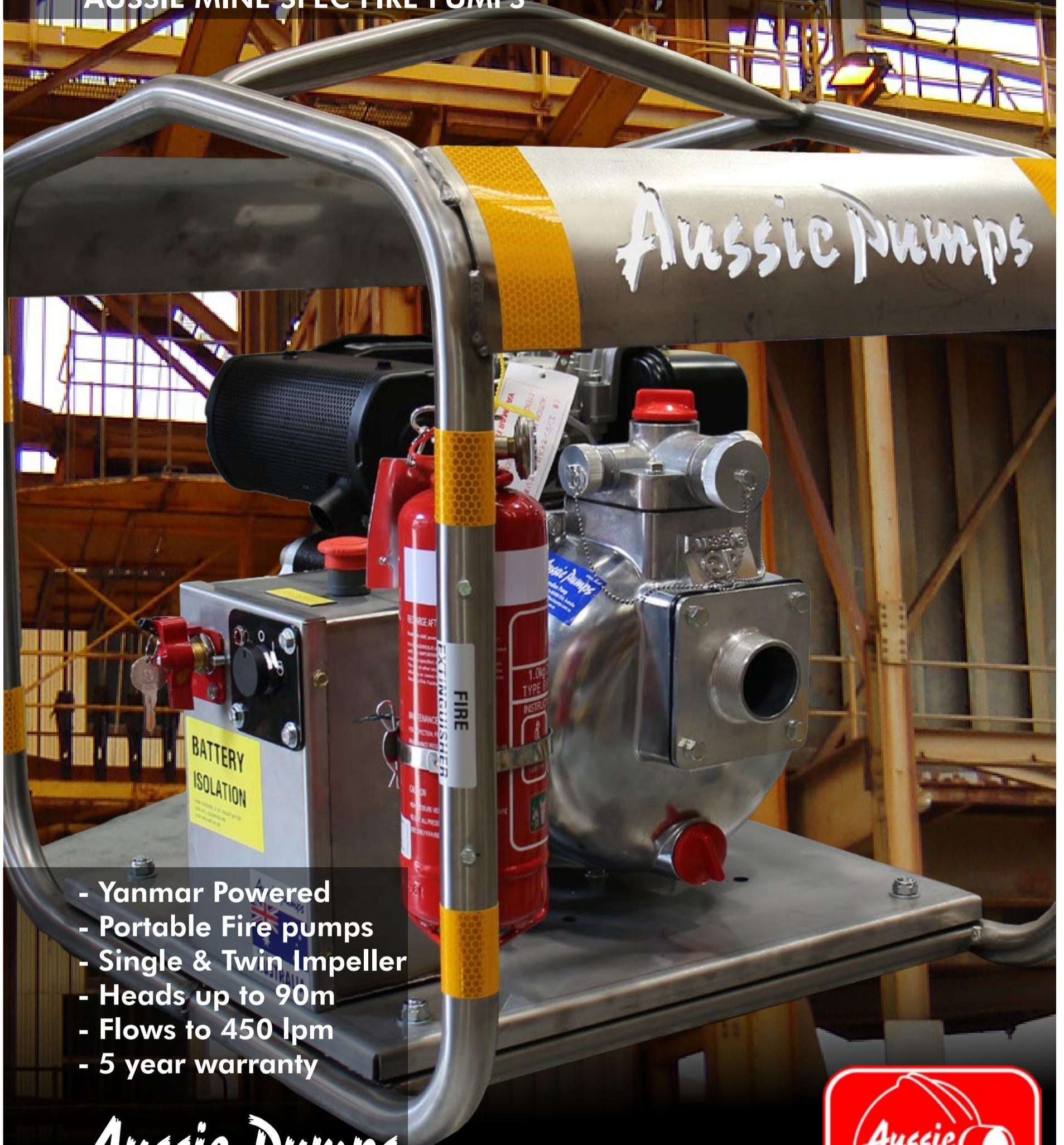
The new Westgold board will comprise of the current Westgold director and two directors from Karora.

Upon completion of the transaction, Westgold and Karora shareholders will own 50.1% and 49.9% of the new company, respectively. **AMR**

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The battery energy storage system will have a capacity of 250MW/2hr.

\$4.6M TO DRIVE QUEENSLAND CRITICAL MINERAL DISCOVERIES

Queensland companies will be able to dig, drill, sample and survey for new critical mineral deposits following a \$4.6m boost.

Funding has been given to projects prioritising the discovery of critical minerals which are needed to make solar panels, turbines, batteries and other technologies the world needs to decarbonise.

The latest round of the Collaborative Exploration Initiative (CEI) provides funding of up to \$300,000 to 18 projects across regional Queensland including near Chillagoe, Townsville, Mount Isa and Cloncurry.

The CEI program complements the Queensland critical minerals strategy which oversees \$245m in investment to transform the state, national and global economy through the responsible use of Queensland's critical minerals.

It also builds on the \$5b Copperstring 2032 project which will help unlock potentially \$500b of critical mineral projects in the North West Minerals Province.

Queensland Resources and Critical Minerals Minister Scott Stewart commented on the funding.

"Queensland companies are on the hunt for minerals that will power tomorrow's world," he said.

"This funding provides a financial safety net for explorers to take on projects in the hope that it will lead to important discoveries.

"By facilitating these exploratory projects, we are not only laying the groundwork for economic prosperity but also reinforcing Queensland's position as a key player in the global resources market."

Funding is provided under the Queensland Resources Industry Development Plan with \$22.6m available until June 2027.

Construction of QLD's biggest BESS, powering towards 70% renewable energy targets

Construction will soon begin on one of Queensland's biggest battery energy storage systems (BESS), following the Supernode project reaching financial completion.

With a capacity of 250MW/2hr, the energy storage system will enable the efficient storage of surplus solar and wind energy and aid in the displacement of coal and other emissions-intensive generation sources.

The Supernode project is located near the South Pine electricity substation in Brendale.

Origin Energy has committed to the full capacity of stage one of works which involves the construction of the system. Following stage one, a data storage facility is planned to be added to the site.

Queensland Premier Steven Miles commented on the construction.

"Renewable energy generation and storage like this will power us towards our 70% renewable energy targets," he said.

"Responsible emissions targets are essential to jobs in our existing industries like mining, agriculture and manufacturing, and it's the key to creating more jobs in the new industries of the future, here in the southeast and right across Queensland."

Stage one of Supernode is part of a \$2.5b data centre integrated facility powered by renewables and battery storage. **AMR**

BHP COMPLETES BLACKWATER AND DAUNIA DIVESTMENT

BHP (ASX: BHP) and Mitsubishi Development (MDP) have completed the divestment of the Blackwater and Daunia mines to Whitehaven Coal (ASX: WHC).

Both mines were part of the BHP Mitsubishi Alliance (BMA) metallurgical coal joint venture in Queensland. BHP and NDP each hold a 50% interest in BMA.

Whitehaven Coal paid BMA \$3.07b (US\$2b) cash consideration on completion, plus a preliminary completion adjustment of \$67.73m (US\$44.1m) for working capital and other adjustments.

On October 18, 2023, Whitehaven paid a

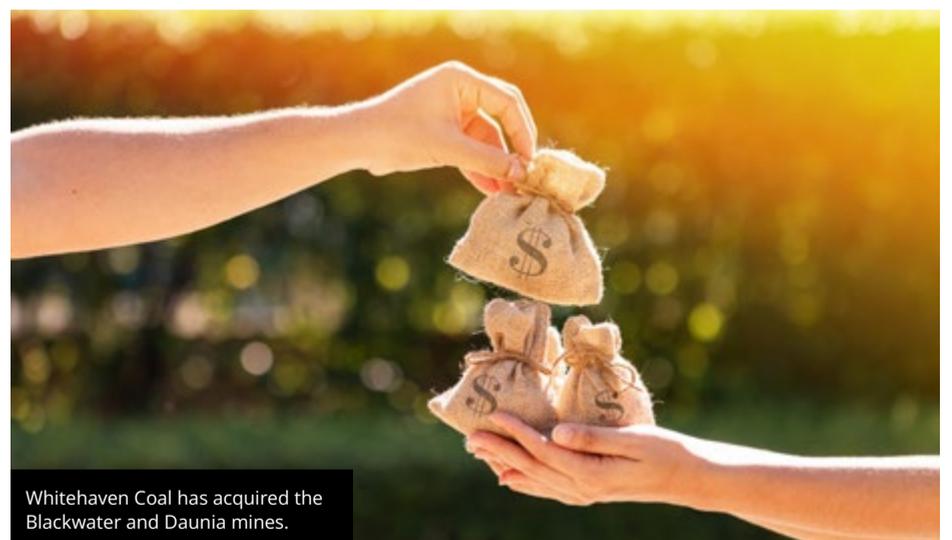
\$153.59m (US\$100m) deposit on signing of the asset sale agreement.

There remains a cash payment of \$1.69b (US\$1.1b), payable by Whitehaven Coal to BMA over three years post completion.

A potential additional amount of up to \$1.38b (US\$900m) in a price-linked earnout may also be payable by Whitehaven to BMA over three years.

Whitehaven managing director and chief executive Paul Flynn says this is a significant milestone for the company.

"This is a significant milestone for Whitehaven that transforms us into



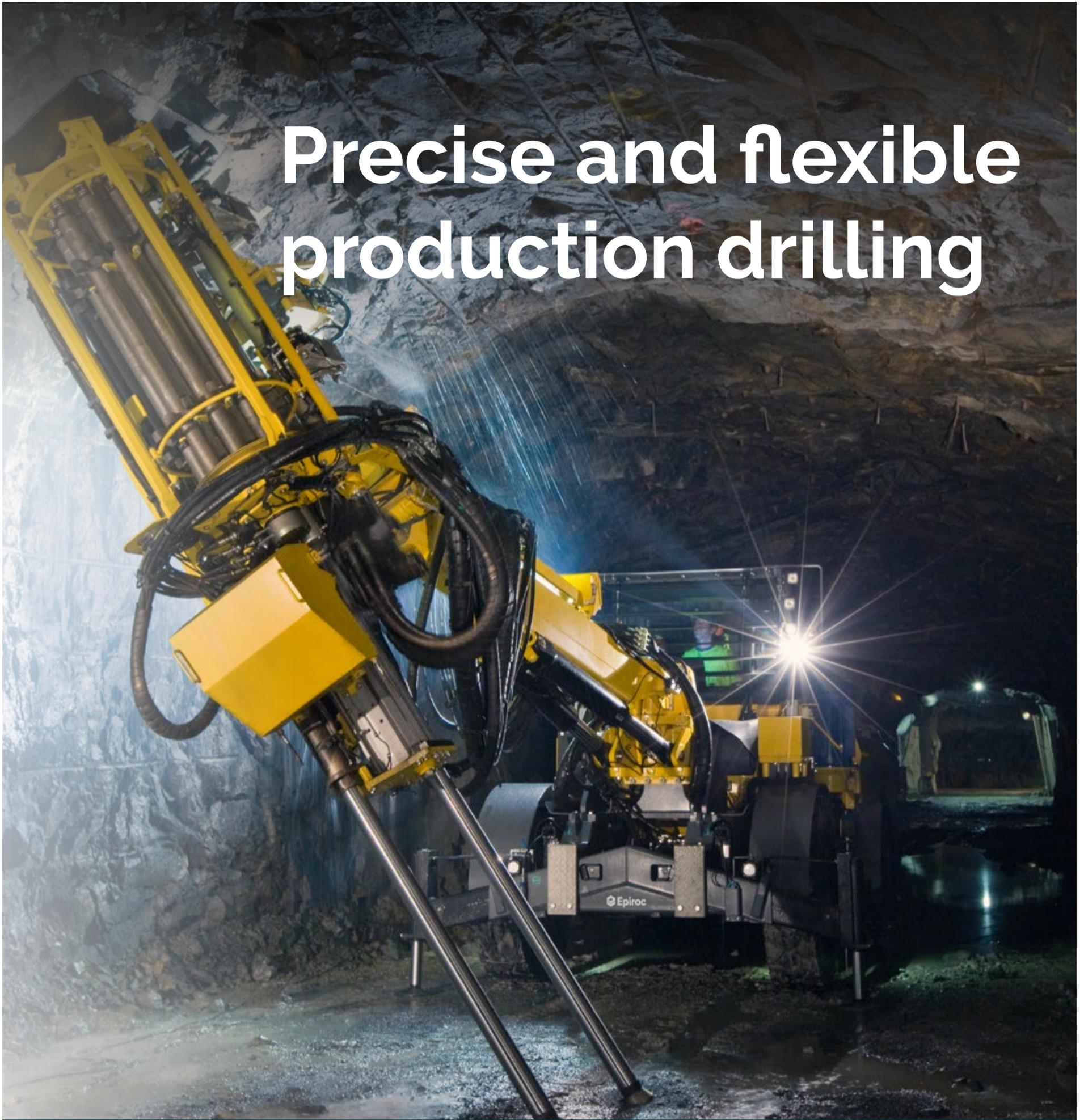
Whitehaven Coal has acquired the Blackwater and Daunia mines.

a leading metallurgical coal producer and will deliver benefits for all of our stakeholders," he said.

"We are well placed to execute a smooth transition and to integrate the Daunia and Blackwater mines into the Whitehaven portfolio.

"We are excited to welcome the teams at Daunia and Blackwater into our business and we look forward to working with the local community and other stakeholders who will remain an important part of our operations." **AMR**

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ALPHA HPA'S \$400M LOAN FOR QLD'S FIRST HPA PROCESSING FACILITY

The Federal Government will provide \$400m in loans to Alpha HPA (ASX: A4N) to deliver the country's first high-purity alumina processing facility in Gladstone, Queensland.

Alpha HPA will use Australian-owned intellectual property and technology to process high-purity alumina which is used on LED lighting, semiconductors and lithium-ion batteries amongst other high-tech applications.

Federal Resources Minister Madeline King commented on the importance of the facility.

"It's a really important industry [high purity alumina] here for Gladstone and to be able to turn that alumina into this high purity alumina is a really significant step

for Australia and, of course, Alpha HPA," she said.

"Our traditional resources in this country continue to underpin the economy and the economic prosperity of the country."

The loans will be provided by Export Finance Australia (EFA) through the Federal Government's \$4b critical minerals facility, plus the Northern Australia infrastructure facility and EFA's commercial account.

Alpha HPA managing director Rimas Kairaitis says the company is delighted to receive the funding.

"We are delighted to receive extensive and attractive financing support from the [Federal] Government," he said.



A high-purity alumina processing facility.

"This financing support represents a comprehensive endorsement of the company's technology and business strategy.

"This key milestone brings Alpha one step closer to establishing Australia's first, sovereign, large scale commercial capability to manufacture high purity alumina and related products to support key high technology growth sectors driving the global energy transition."

Conditional \$185m to Renascor

The Federal Government has also conditionally approved \$185m to Renascor Resources (ASX: RNU) to fast track the development of stage one of its Siviour graphite project in South Australia.

Renascor will deliver sustainable and ethically sourced production of Australian-

made purified graphite for use in lithium-ion batteries required for electric vehicles and renewable technologies.

Renascor managing director David Christensen commented on the approval. "Our phased development strategy provides us with an early-mover advantage by entering the market with reliable supply of natural graphite concentrates from Australia," he said.

"The support from the [Federal] Government and EFA is testament to the gravity of the opportunity for Renascor, and Australia, to become a world-leading supplier of graphite into the lithium-ion battery supply chain." **AMR**

THIESS SECURES \$1.9B BHP CONTRACT, CELEBRATES 90 YEARS OF OPERATION

Thiess has secured a six-year \$1.9b contract extension with BHP (ASX: BHP) to provide mining services at the Mount Arthur South mine in NSW.

Work will see Thiess operate and maintain mining equipment to support BHP's production requirements, as well as working with BHP and the local community towards the planned mine closure.

Thiess executive chair and chief executive Michael Wright commented on this.

"This contract extension acknowledges Thiess' strong safety record and ongoing operational performance and builds on the longstanding relationship between Thiess and BHP that started more than 30 years ago," he said.

The recent achievement is a far cry from the mining services company's humble beginnings.

On April 16, 1934, small farming and roadworks company Thiess Bros began operating in rural Australia and 90 years later the company has grown across seven countries and three continents.

In its first year of operations, Thiess successfully tendered for the Kilkivan roadworks job and in 1939 the company was commissioned to complete the excavation work required for the Luna Park entertainment venue at BowenHills.

In the 40s, Thiess expanded into coal mining with the Heifer Creek cutting,

marking a pivotal period of growth for the company, while in the 50s Thiess expanded globally, pioneering in dam construction and reclaiming land.

The 60s saw Thiess lead large-scale projects, venture into international markets and diversify into coal exports.

During the 2010s, Thiess implemented autonomous systems and was awarded its first autonomy contract to provide support services to Fortescue Metal Group's (ASX: FMG) Solomon mine in WA.

In 2018 Thiess was awarded another contract with Fortescue to install autonomous haulage system technology at the Christmas Creek operation.

Thiess is now continuing to expand its offerings, implement the newest in

technological innovation and uphold sustainable practices.

Mr Wright says the company has remained focused on delivering great value to clients, including continually improving and evolving.

"Throughout our 90 years of operations, we have challenged norms, created opportunities from change and have always moved forward," he said.

"We will continue to transform our business and leverage our founders' pioneering spirit to innovate sustainable solutions for a brighter tomorrow, for our people, our clients and communities."

Mr Wright says Thiess is strongly aligned with BHP in its commitment to diversity in their workforce.

"[This is] demonstrated by our award winning MASITE (Mount Arthur South Indigenous / Inclusive Trainee Employment) program, which has resulted in significant increases in the number of our local Indigenous and female employees."

The MASITE program, launched in March 2021, targets new-to-industry Indigenous and female candidates with an aim to grow talent from within local communities while encouraging greater participation from Aboriginal, Torres Strait Islander and females in the local community.

Over the 12-month program, participants are immersed in a comprehensive curriculum which includes theoretical and practical training with a focus on safety, operational excellence and technical proficiency.

Since its launch, the MASITE Program has had 122 participants, including 73 women and 57 Indigenous individuals.

Female participation onsite increased by 5.2% and Aboriginal and Torres Strait Islander participation increased by 9%.

A total of 92% of MASITE trainees have transitioned to permanent roles at Thiess upon completion of the program.

In 2024, Thiess is aiming to onboard between 48 and 72 new trainees to continue to empower individuals to have successful careers in the mining industry.

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Thiess has significantly expanded since its beginnings 90 years ago.



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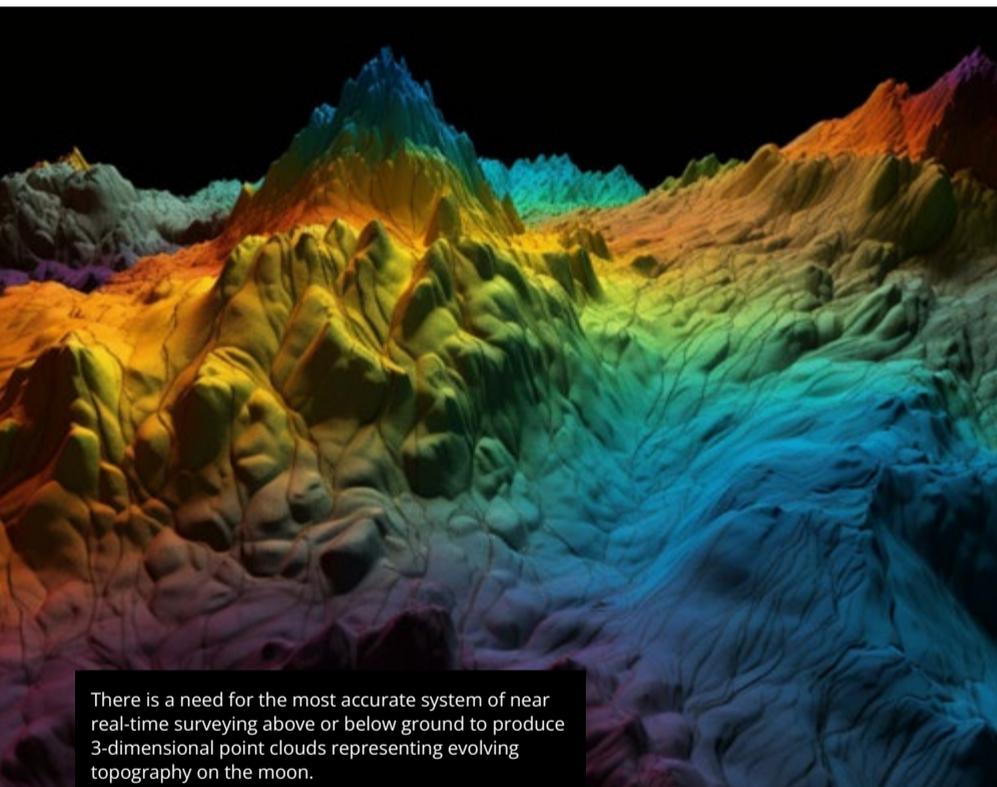


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MOON EXPLORATION AND MINING THROUGH THE AUSTRALIAN METS SECTOR



In-space manufacturing is a currently small, but potentially large growth sector that utilises low gravity, pressure and temperature conditions to fabricate high quality, high value-added materials that are prohibitively expensive to manufacture on Earth.



There is a need for the most accurate system of near real-time surveying above or below ground to produce 3-dimensional point clouds representing evolving topography on the moon.

Australian companies are being encouraged to showcase their technologies to aid, on a global scale, with off-world or extra-terrestrial exploration.

Austmine and AROSE are collaborating with NASA, as the agency looks to the Australian mining, equipment, technology and services (METS) sector for solutions to "space mining".

Shortlisted companies will have the chance to present their solutions at the NASA-USGS Workshop in San Jose, California in May, offering exposure and recognition on an international platform.

Over the past year, there has been a notable increase in interest from both the Australian Space Agency and NASA in the mining and METS sector.

This heightened interest reflects the recognition of the overlap between space exploration and mining operations, presenting opportunities to expedite future mission design leveraging Australia's expertise in minerals exploration here on Earth.

In addition to showcasing our nation's capabilities, Austmine and AROSE are eager to learn alongside NASA as they adapt technology for lunar exploration, further advancing capabilities for both.

Austmine chief executive Christine Gibbs Stewart says that "exploring with NASA underscores the exceptional capabilities, world leading reputation and innovative spirit of the Australian METS sector".

"This workshop provides a unique opportunity for the Australian METS sector to demonstrate not only their expertise in mining technology but also how these innovations can be applied in the challenging environment of space exploration," she said.

"By participating and submitting their innovative ideas to these challenges, Australian companies are not only showcasing their capabilities to NASA but also are further positioning themselves as technology leaders no matter what the environment."

AROSE program director resource and space Michelle Keegan says, "this showcase will not only offer NASA the ability to understand our capabilities, but also provide the METS sector a unique path to innovate for their ongoing work here on Earth".

The NASA opportunities will be hosted on Austmine's innovation platform, **mineinnovate**, providing a dynamic space for collaboration and solution development within the METS sector.

1. Detecting and assessing minerals on the moon for off-world manufacturing

NASA's SpacePortal is looking for solutions capable of detecting, measuring, and mapping critical lunar minerals such as zirconium, barium, fluorine and sodium. This endeavour aims to facilitate off-world manufacturing by creating high-quality materials in the unique conditions of space.

2. Reducing geologic uncertainty through multi-sensor data fusion

NASA's Ames Research Center, in collaboration with the United States Geological Survey (USGS), seeks improved methods for fusing data from multiple sensors to enhance geological interpretation in space. This initiative aims to reduce uncertainties associated with current single-modality measurements.

3. Advancing off-world SLAM (simultaneous localisation and mapping)

The prospect of sustained human presence off-world necessitates autonomous systems capable of conducting intricate tasks, including excavation, above and below the lunar surface. NASA Ames is looking to discover the most accurate system of near real-time surveying that produces accurate 3-Dimensional point clouds of evolving lunar topography.

For more information and to find out how to get involved, visit:
www.mineinnovate.com.au

AMR

APPLICATIONS OPEN FOR MRIWA SCIENCE COMMUNICATION AWARDS



Applications have opened for the second MRIWA science communication awards.

MAY2024 AMR

Applications are open for the second Mineral Research Institute of Western Australia (MRIWA) science communication awards.

The aim of the award is to encourage and recognise the value of high-quality, high-impact communication of mineral research, technology and services in WA's mining and minerals industry.

The awards are open to industry professionals, students, researchers and academics engaged in minerals research in WA.

First place will receive \$5000, second place will receive \$2000 and third place will receive \$1000, while shortlisted finalists will be provided with a science communication masterclass to enhance their skills.

Submissions are to be in the form of a three-minute video presentation and scientific accuracy will be assessed as part of the judging process.

WA Mines and Petroleum Minister David Michael commented on the award.

"Effective science communication is not merely about conveying information – it's about inspiring curiosity and fostering a deeper appreciation of the discoveries being made," he said.

"Importantly, the MRIWA science communication awards recognise the local talent contributing to minerals research ecosystem.

"Science communication is the vital conduit through which the complexities of science are translated into accessible, actionable knowledge for the benefit of all."

Applications opened on April 1 and close on May 10 with the winner to be announced at the MRIWA research showcase on August 21. **AMR**

Four Seconds That Could Change Your Life.

Paul is seven hours into his shift.
He's feeling tired, and he's trying to fight it.
Music and the air conditioner are cranked up.

He's already had a microsleep but doesn't realise it.
The next one could kill him.

Paul is one of the 62% of Australian truck drivers who report being fatigued or falling asleep at the wheel at least once a month. For some, it was as often as once a week.*

In a four-second microsleep, a truck travelling at 100km/h will have gone more than 100 metres with nobody in control. On a mining site, a remote road or an urban highway, a lot can go wrong in 100 metres.

It is little wonder driver fatigue plays a role in up to 30% of all deaths and serious injuries on Australian roads.

If Paul's truck was fitted with a NOMAD portable IVMS from Digicore, it would have detected his eye movements and alerted him that he was at risk of falling asleep.

The NOMAD combines the latest in-vehicle monitoring technology with Driver Fatigue and Distraction Monitoring in one fully portable, easy-to-install kit.

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*<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9916394/>

MAIDEN MRE RELEASED FOR BURRACOPPIN

Askari Metals (ASX: AS2) has released a maiden mineral resource estimate (MRE) for its Burracoppin gold project in WA.

The MRE stands at 1.32mt at 1.52g/t gold using a 0.85g/t gold cut-off grade containing 64,600oz of gold was prepared by JP Geoconsulting Services using geological data from previous reverse circulation (RC) drilling programs.

The MRE is a combination of mineral resource estimates from the Benbur-Christmas Gift, Easter Gift and Lone Tree prospects.

It incorporates data from 155 RC drill holes, with 69 coming from Askari and 86 from historical holes.

Askari managing director Gino D'Anna said the company is pleased with the delivery of a maiden MRE for Burracoppin.

"The delivery of the maiden resource at Burracoppin marks a significant achievement in the history of the company," he said.

"Exploration and RC drilling at the Burracoppin project by Askari Metals commenced in July 2021 following up



A maiden 1.32mt MRE has been released for Burracoppin in WA.

historic exploration and resulted in several high-grade shallow gold intersections being encountered including 3m at 17.41g/t gold from 73m.

"Significant exploration potential and resource expansion upside remains at Burracoppin which the company is currently investigating." **AMR**



Drilling will be carried out at the Lefroy project to test several banded iron formation hosted areas.

Lefroy Exploration (ASX: LEX) has begun a 17-hole reverse circulation (RC) drilling program across its Lefroy project in WA.

Drilling will be undertaken on the Lucky Strike and Havelock targets to test several

banded iron formation (BIF) hosted areas along strike and down plunge from significant historic drill intersections.

Lucky Strike incorporate a significantly underexplored corridor prospective for BIF hosted gold mineralisation with

LEFROY BEGINS DRILLING AT NAMESAKE PROJECT

drilling conducted in 2020 returning 8m at 18.66g/t gold from 145m including 5m at 28.1g/t gold from 145m.

At Havelock, a single air core hole intersected strong quartz veining in an oxidised BIF unit, interpreted to be similar to the mineralised-hosting rocks at Lucky Strike.

Further drilling in December 2020 returned more gold intersections with several highly mineralised intersections reported, including 3m at 13.37g/t gold from 118m.

Lefroy chief executive Graeme Gribbin

says the start of drilling is exciting for the company.

"Our campaigns at Lucky Strike and Havelock are exciting for a number of reasons, not least because they present standout targets with significant prospectivity confirmed from successful drilling programs conducted in 2020 and 2022," he said.

"Havelock and Lucky Strike represent the first of a number of pre-resource and resource extension exploration targets Lefroy is advancing in a phased approach."

AMR

LITHIUM SOIL ANOMALY AT PENNY EAST

A new lithium soil anomaly has been encountered at Venus Metals' (ASX: VMC) Youanmi lithium project in WA.

Recent soil geochemical surveys conducted at the Penny East prospect uncovered distinct lithium soil anomalies more than 110ppm lithium oxide with a peak of 182ppm lithium oxide.

The main geochemical anomaly measures 800m in length and up to 600m in width.

Based on the interpretation of aeromagnetic imagery, the anomalies lie adjacent to an intrusive body within a north-west-southeast trending shear zone.

This shear zone is considered to be a splay from the Youanmi fault zone which lies 8km to the west.

Venus managing director Matthew Hogan commented on the finding.

"The Venus Metals exploration team have been systematically targeting lithium prospects across our wholly owned Youanmi lithium project by utilising modern geochemistry, geophysics and drilling," he said.

"With the emergence of Penny East, there are now reported lithium anomalies of mineralisation over about 30km of strike of the Youanmi fault zone."

An urgent program consisting of field sampling and shallow drilling has been planned at Penny East and will coincide with drilling at the Deep South lithium deposit which recently intersected 14m at 2.54% lithium oxide.

AMR



A lithium soil anomaly with a peak of 182ppm lithium oxide has been identified at the Penny East prospect.

The New IMS-BP1200-48TB Track Blender, with four five-meter-long feed hoppers holding 12m³ each with separate feed hopper conveyors with attached belt scales and fully automate with a PLC control and recording system that can be operated with an iPad from a loader or site office. Powered by a Cat C7 Generator that can be connected to mains power, driving Nord Electric motors with variable speed and feed hooper stop/start sensors with remote. The genset can also drive a 24-meter radial conveyor. The BP1200-48TB can produce up to 1000 tonnes per hour.



The BP1200-48TB can also work in conjunction with the IMS modular electric pugmill on skids producing up to 500 TPH of water or powder blended material and stockpiled with an IMS 24-meter radial conveyor with auto radial return.

IMS – PM1200-20TB Track Pugmill with two separate five-meter-long feed hoppers holding 10m³ each which can be extended to 12m³, the feed hoppers have the option of fitting vibrating hydraulic tipping grids. Both feed hoppers have front of hopper adjustable flow gates, variable speed, and belt scales with the option of being fully automated. There is the option of adding two powder hoppers and two liquids.



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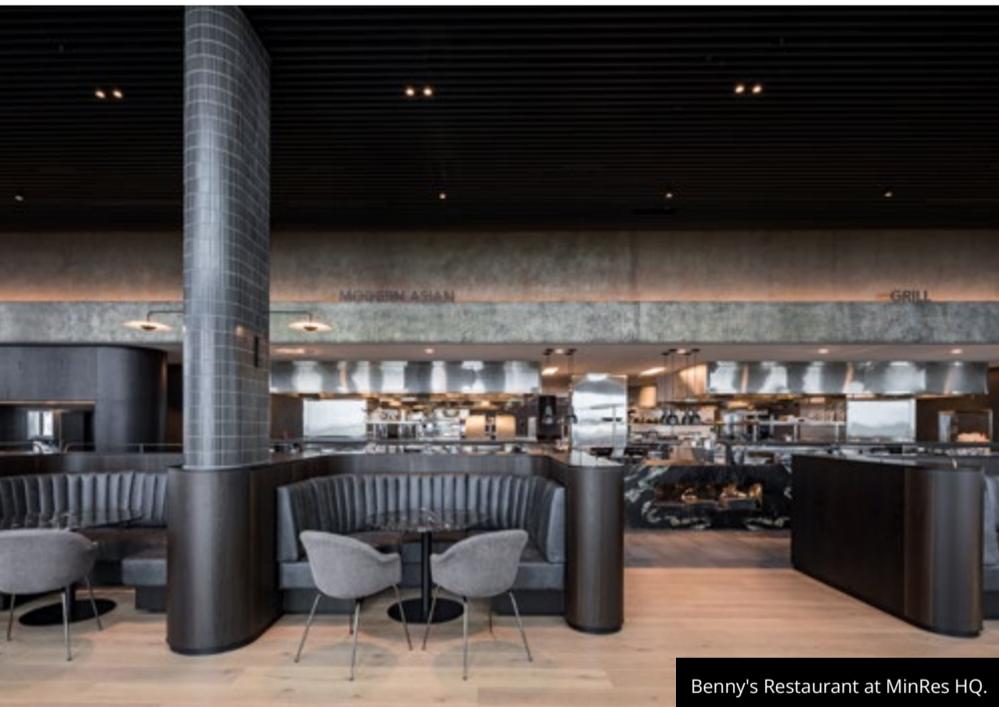


The MinRes building in Osborne Park, Perth, WA.

MINRES PERTH HEADQUARTERS GETS GREEN STAR CERTIFICATION



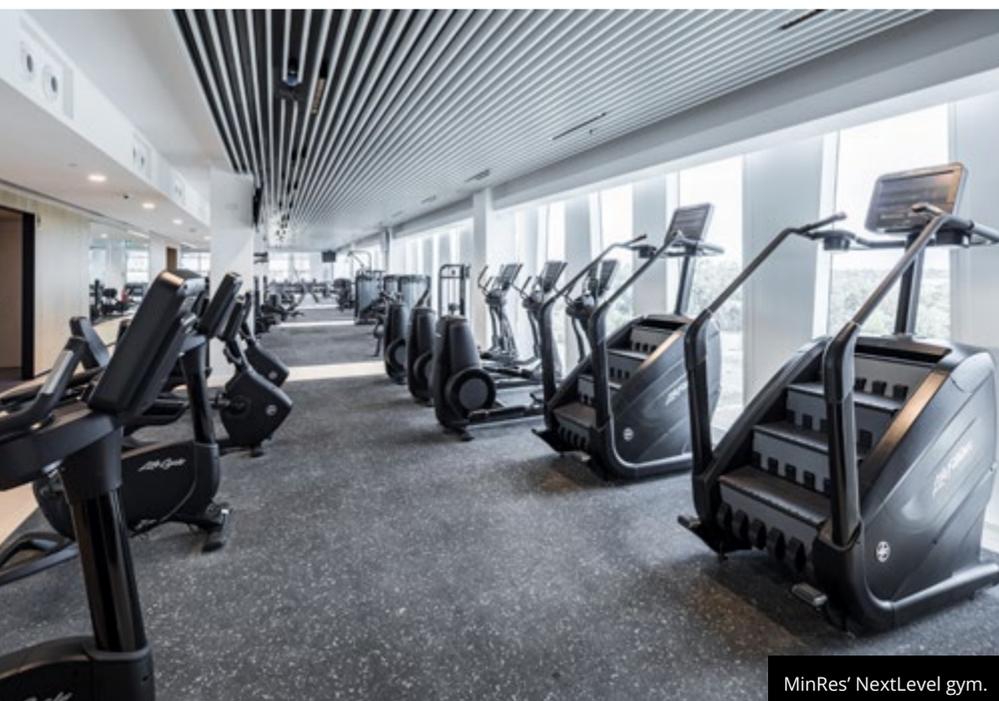
Reception at MinRes HQ.



Benny's Restaurant at MinRes HQ.



MinRes' NextGen creche.



MinRes' NextLevel gym.

After opening in June 2022, Mineral Resources' (ASX: MIN) has received green star certification for its headquarters in Osborne Park, Perth, WA.

This building is the seventh in the state to receive six-star green star design and as built certification from Green Building Council Australia (GBCA).

Certification from GBCA assesses the sustainability outcomes from the design and construction of new building or major refurbishments across management, emissions, land use and ecology, innovation, materials, indoor environment quality, water, transport and energy.

The green star ratings encourage the industry to create building that are liveable, healthy, productive, sustainable and resilient.

Mineral Resources executive general manager corporate development James Bruce says the certification is an outstanding achievement for the company. "This significant investment in creating a high-quality,

sustainable headquarters has reinforced how we care about our employees and the quality of their working environment," he said.

"Green star recognition reflects our MinRes culture and our focus on providing productive and collaborative places where our employees feel included.

"It's a great achievement and follows years of work by many people at MinRes making a contribution to a more sustainable Australia."

Mineral Resources' building features a subsidised café and restaurant, a commercial quality gym, a family zone for working parents and a wellness centre providing medical and psychology services.

It also includes a state-of-the-art air filtration system, water stations, lighting systems which work on the concept of circadian rhythm, climate control, soundscape system and contactless doors and taps. **AMR**

SAFER & MORE EFFICIENT CUSTOMER OPERATIONS THROUGH MARAND AUTOMATION

With over 50 years of excellence in precision engineering, Marand Precision Engineering has established itself as a cornerstone of innovation across diverse sectors such as aerospace, defence, rail, automotive, mining and energy. Our dedication to crafting bespoke solutions is driven by a blend of experience, ingenuity and a relentless pursuit of quality, positioning Marand at the vanguard of the industry.

Integrated Manufacturing Excellence

Marand's commitment to delivering unparalleled engineering solutions is manifested in our holistic approach to manufacturing. From conceptualisation to implementation, our suite of services includes project management, design, manufacture, installation and commissioning, as well as ongoing maintenance and support across a range of engineering disciplines. This integrated approach is underpinned by our versatile, high-quality engineered products, offering our clients a significant competitive edge.

The Vanguard of Automation and Robotics

Our automation and robotics division epitomises innovation, designing and producing systems that redefine operational efficiency. By leveraging our deep industry connections and technical expertise, we deliver solutions that range from specialised machinery and robotics to comprehensive turn-key manufacturing plants.

The strategic incorporation of automation and autonomous systems facilitates remarkable cost savings, elevates production quality, minimises human error, and enhances workplace safety.

Our reputation and passion for success has seen us successfully leverage our history into the mining rail space, supplying >\$200m of special machines, safe handling and automation solutions to mining companies, including BHP Billiton, Rio Tinto, Fortescue Metals, Roy Hill, Aurizon and others.

Enhancing Operations: A Case Study with BHP

Our collaboration with BHP on the Mooka Ore Car Repair Shop (OCRS) exemplifies Marand's capability to transform maintenance operations through automation.

Marand worked closely with BHP Billiton's own team to develop an automated iron ore rail freight wagon maintenance facility at the mining company's Mooka Ore Car Repair Shop (OCRS). With a focus on safer operations with increased diversity via automation, Marand collaborated with the BHP Billiton project team undertaking an extensive definition phase study to rethink the facility's approach to maintenance.

Along with providing the equipment, part of the project was the implementation of heavy load Automated Guided Vehicles (AGV) to transfer the wagons and bogies

inside the facility; Marand designed and built custom stillages and other equipment that would enable the AGVs to shift the large loads (more than 20 tonne) in a cohabitated worker environment safely.

This project not only optimised safety and operational efficiency but also demonstrated our commitment to pioneering ergonomic and safe industrial solutions.

Committed to Safety and Compliance

Safety is paramount at Marand. Our team of Certified Functional Safety Application Experts (CFSAE) ensures our engineering solutions exceed industry standards for safety and compliance. Our expertise and experience in functional safety has been applied to turnkey and bespoke solutions, existing equipment and systems, retrofit projects and to imported equipment to ensure compliance.

We close the loop on Functional Safety assessments with our ability to apply our engineering services to rectify the identified issues.

Complementing our Functional Safety expertise we have engineers experienced and qualified in the assessment and implementation of EX rated equipment and environments.

Future-Forward Vision

As Australia's leading designer and manufacturer of robotic and automation equip-

ment, Marand is propelled by the vision of a technologically advanced future. Our history of success is a testament to our commitment to excellence and innovation. By partnering with Marand, clients ensure their projects and operations remain at the forefront of technological advancements.

Embrace the Marand Vision

Engineering. Manufacture. Sustain:
A better future. Together.

At Marand, our mission resonates through every solution we engineer, every product we manufacture, and every initiative we undertake towards sustainability. "Engineer. Manufacture. Sustain." isn't just a slogan; it's our blueprint for innovation and our commitment to contributing to a better future. Together, we are not just shaping industries; we are crafting a legacy of excellence and responsibility.

Discover how this dedication can elevate your operations and projects, aligning with a vision that transcends mere technological advancement to embrace a sustainable and prosperous future for all.

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and join us in our journey towards
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excellence, and sustaining a better
future, together.

AMR



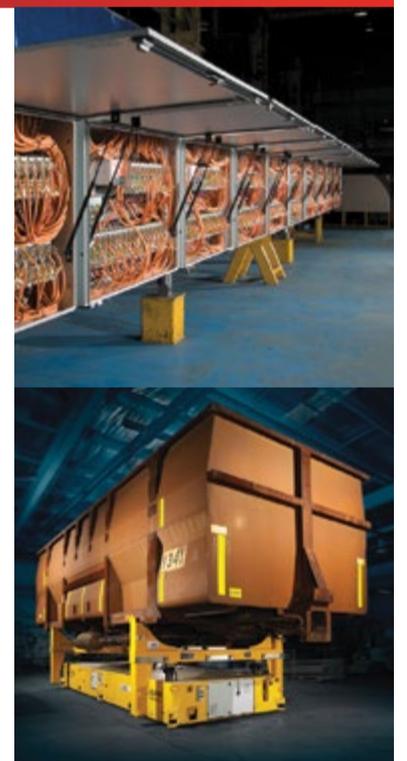
MARAND

Heavy Industry Automation Specialist



Marand is Australia's largest automated equipment and facility designer, manufacturer and integrator with a proven history and client base within the mining industry.

- Custom machines and equipment
- Robotic solutions – materials handling, welding, assembly
- Autonomous AGV/AMR for various loads and applications
- Functional Safety assessment and resolution
- Engineering design services – equipment and facility



Engineer. Manufacture. Sustain.
A better future. Together.



Marand Precision Engineering Pty Ltd

Automation: greg_perry@marand.com.au

MARAND.COM.AU

(Image source: Liontown Resources) Dragonfly Accommodation Village at the Kathleen Valley lithium project.



KATHLEEN VALLEY VILLAGE SERVICES CONTRACT TO SIRROM CORPORATION

Liontown Resources (ASX: LTR) has awarded Sirrom Corporation the Kathleen Valley village services contract.

The award comes after a vigorous tender process in which Sirrom Corporation showcased its extensive experience and distinctive service offerings.

Under the contract, Sirrom Corporation will be responsible for the management of the Kathleen Valley dragonfly village, including dining offerings, site-wide cleaning

services and the running of the on-site café, retail shop, gym and tavern.

Sirrom Corporation will work closely with the Tjiwarl Traditional Owners to support the creation of social and economic value for the local communities.

Established in 1966, Sirrom Corporation is an Australian-owned business that has extensive experience in supporting remote accommodation facilities for mining operations.

It works across a broad range of sectors including remote mining communities, international defence operations, oil and gas projects and commercial accommodation facilities.

When it comes into production in mid-2024, the Kathleen Valley lithium project in WA will be one of the world's largest lithium mines.

The project has a mineral resource estimate of 156mt at 1.4% lithium oxide and

130ppm tantalum pentoxide, plus an ore reserve of 68.5mt at 1.34% lithium oxide and 120ppm tantalum pentoxide with an expected mine life of over 20 years.

Operations have been optimised for an initial 3mtpa, producing around 500ktpa of spodumene concentrate with a 4mtpa expansion planned in year six to deliver around 700ktpa spodumene concentrate.

AMR

KIDS GO NOM! FOR HEALTHY FOOD

Pilbara Minerals (ASX: PLS) has signed a three-year partnership with Foodbank WA to deliver a hands-on nutrition education and cooking program to empower school students to build life skills that support healthy eating.

The nom! Schools program, which aims to improve the nutrition and developmental outcomes for WA kids, is possible thanks to funding from Pilbara Minerals and Mineral Resources (ASX: MIN).

Foodbank WA nutritionists will be delivering sessions at 40 schools across Perth, Pilbara, Geraldton and Bunbury each year through the program.

Pilbara Minerals chief operating officer Vince De Carolis says the company is proud to support an initiative that will make a difference to the health and wellbeing of thousands of WA kids.

"Good nutrition is important for children's overall wellbeing including school atten-

dance and learning as well as prevention of chronic health conditions," he said.

"This is a great example of the resources sector partnering on a community initiative to make a difference in the world.

"We're looking forward to seeing the program travel to regional WA, including the Pilbara, to reach some of the State's most vulnerable communities."

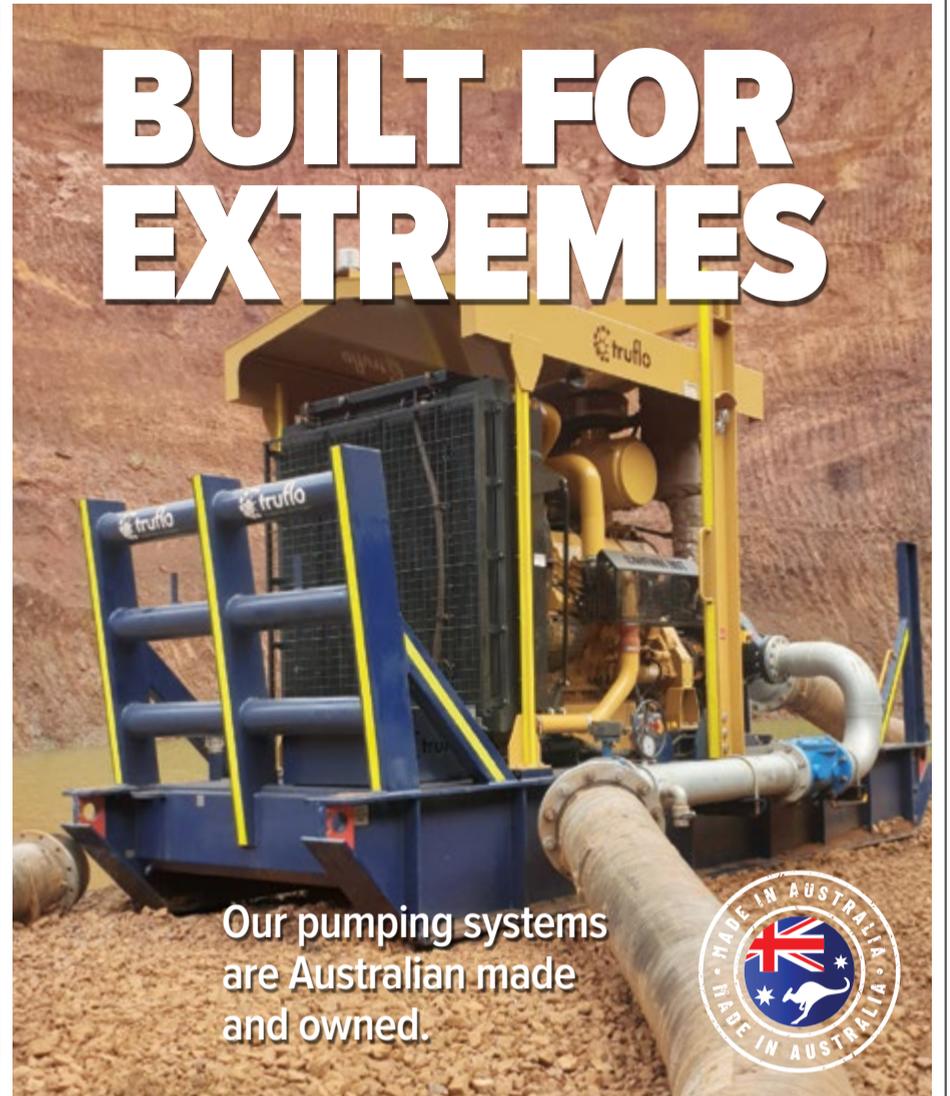
Foodbank WA chief executive Kate O'Hara says the program is all about empowering kids to make healthy food choices for life.

"Foodbank WA has delivered empowering nutrition education programs for over 17 years with all programs developed by a team of nutritionists and dietitians," she said.

"We are thankful to both Mineral Resources and Pilbara Minerals for their support of nom! Schools enabling us to deliver this important program across WA." **AMR**



Pilbara Minerals chief operating officer Vince De Carolis and Foodbank representative Laura empowering school kids to make health food choices.



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WA DEMIRS FUNDS NEW PHD SCHOLARSHIPS



The WA DEMIRS is funding the creation of new PhD scholarships.

The WA Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) is funding the creation of PhD scholarships as part of the Mental Awareness, Respect and Safety (MARS) Program.

Administered by the Minerals Research Institute of Western Australia (MRIWA) the scholarships are open to WA university students who are undertaking studies in any of the MARS program focus areas:

- Creating mentally healthy workplaces

– by managing psychosocial hazards and promoting positive practices at work that support mental health and well-being

- Building a culture of safety and respect – with healthy, safe, gender-equitable, respectful and inclusive workplaces
- Preparing for workplace safety in future mining – by ensuring all workers are educated and trained in safety, addressing emerging risks and fostering safety innovation in new technologies

Awardees will receive a payment of up to \$40,739, plus research and travel support of up to \$5820pa for up to three years of study.

Scholarship recipients are also eligible to join the MRIWA scholar community and participate in a suite of professional development training and mentoring provided for future minerals research and industry thought leaders under MRIWA's Education Program.

MRIWA's scholarships are awarded to sup-

port postgraduate students undertaking research relating to any eligible aspect of WA's minerals industry.

This includes improving the discovery rate of economic mineral resources, reducing greenhouse gas emissions from the mining industry, lowering the carbon footprint of steel production, reducing the environmental impact of mining and alternative uses of mine tailings and mineral by-products. **AMR**

RIO TINTO INVESTS IN TECHNOLOGY START-UPS FOR MINING

Rio Tinto (ASX: RIO) is partnering with a global venture studio and start-up investor to back the development and commercialisation of breakthrough technologies in the mining sector.

Partnering with Founders Factory, Rio will invest \$14.4m in global pre-seed and seed stage start-ups over the next three years with a focus on technologies in safe mine operations, decarbonisation, exploration processing and automation.

Each of the start ups will receive a cash investment and take part in a four-month accelerator program run by Founders Factory to support product development and commercialisation.

Rio iron ore chief executive Simon Trott commented on the partnership.

"Technology has always been at the forefront of our industry and WA can be the Silicon Valley of the global mining industry," he said.

"Our iron ore operations in the Pilbara are among the most technologically advanced in the world.

"This exciting new partnership gives us the opportunity to build on our innovative legacy to unlock new technologies and help our business find better ways to provide the materials the world needs."

This partnership with Rio makes Perth the first location for Founders Factory's entry into the Australian market.

With \$7.2m in funding from the WA Government, Founders Factory's Perth



Rio Tinto will invest \$14.4m to back the development of technologies in the mining sector.

hub will drive decarbonisation and diversification with a focus on nature and bio-diversity start-ups.

Founded in 2015, Founders Factory aims to build and fund start-ups in partnership with entrepreneurs and some of the world's biggest companies.

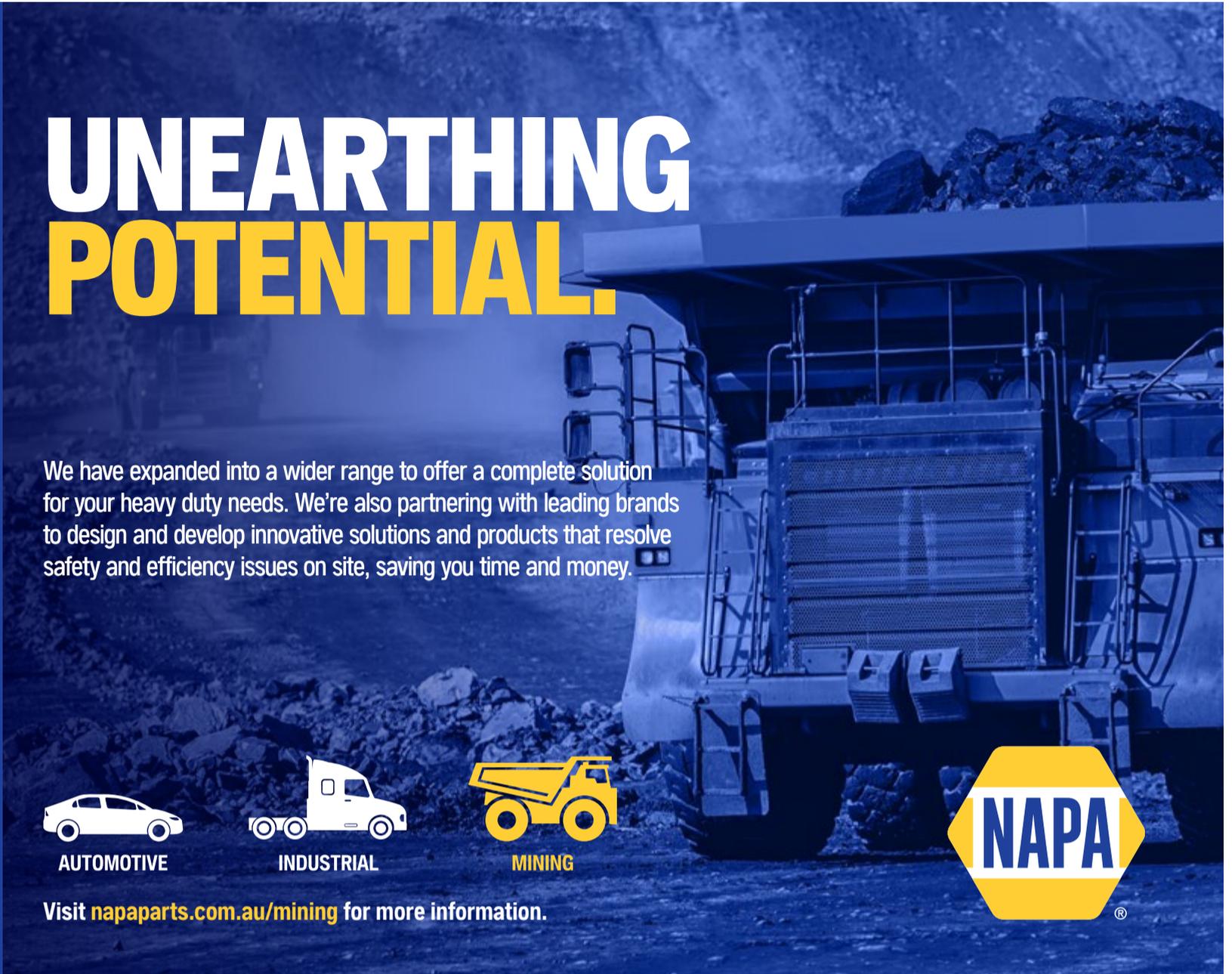
Backing more than 300 companies across the world, Founders Factory runs programs in New York, London, Berlin, Milan and Johannesburg.

WA Premier Roger Cook says securing

Founders Factory in Perth is a major coup for the State.

"This is the first time the tech accelerator has operated in Australia, providing a springboard for innovative local businesses to reach an international audience and maximise their chances of success," he said.

"This three-year partnership will further cement WA's position as a global leader in research and development, helping to diversify the economy and create the jobs of the future." **AMR**



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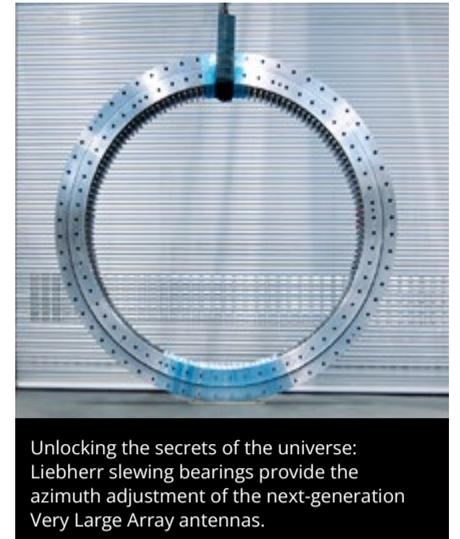
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GROUND-BREAKING 2023 REVENUE FOR LIEBHERR



The 'Autonomous Haulage Solution' project has reached an impressive milestone: in October, four T 264 dump trucks entered into operation for validation testing with a customer.



Unlocking the secrets of the universe: Liebherr slewing bearings provide the azimuth adjustment of the next-generation Very Large Array antennas.

The Liebherr Group achieved another record year in CY23, surpassing the previous revenue record set in CY22.

It finished up 2023 with a revenue of \$23.27b (€14,042m), a growth of 11.5% or \$2.41b (€1,453m) compared to the 2022. A total of There were increased revenues in 11 of its 13 product segments.

At \$15.84b (€9,557m), revenue in the earthmoving, material handling technology, deep foundation machines, mobile and crawler cranes, tower cranes, concrete technology and mining product segments was 11.6% higher than in the previous year.

In the product segments of maritime cranes, aerospace and transportation systems, gear technology and automation systems, refrigerators and freezers, components and hotels, Liebherr achieved total revenues of \$7.43b (€4,485m), an increase of 11.3% compared with the previous year.

The business saw positive growth in virtually all sales regions, with Liebherr Group achieving a net income of \$608m (€367m) in CY23.

Mining

Total revenue in the mining product segment reached \$2.41b (€1,455m) in CY23, an increase of \$378m (€228m) or 18.6% from the previous year.

Most of the sales came from the Asia and Oceania region at 65.1%, followed by Africa, Near and Middle East region at 15.6% and Central and South America region at 8.3%.

"Exponential growth was observed in Asia and Oceania, with encouraging results in Australia and Mongolia," Liebherr's 2023 Annual Report said.

"Liebherr Mining's forward order book for many major markets, except for Australia, slowed in 2023, in line with comprehensive global challenges facing the industry."

Liebherr delivered the first electric excavators to an iron ore site in WA, with an increasing number of the company's mining trucks and excavators powered with its D98 series of internal combustion engines.

"The first new excavators supplied with D98 engines were delivered to customers in Australia," the report continued.

"Liebherr and Fortescue's joint development of zero emission haulage trucks reached an exciting milestone in 2023, with the first T 264 trucks of the major order for Fortescue delivered this year.

"While these trucks have been supplied with diesel internal combustion engines, these will be replaced by battery and fuel cell technology once validated, which is well on the way to being completed."

Employees

Of the 53,659 employees worldwide, just under 9% are stationed in the Asia and

Oceania region, or 4,542 employees. Total employees worldwide increased by 2,338 or 4.6% in CY23, with 378 of those in Asia and Oceania.

2024 Outlook

The International Monetary Fund has forecast that global economic growth will stabilise at 3.1% in 2024, with stable growth of 4.1% anticipated in emerging market and developing economies.

On the other hand, the World Bank expects global growth to slow to 2.4%.

Liebherr mentioned in its 2023 Annual Report that the company has started CY24 with a "very solid order backlog", with demand for large cranes and raw materials growing.

"This provides market opportunities for Liebherr," the report said. "The Group anticipates growth in the USA and Australia, for instance." **AMR**

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BULK MATERIAL CONVEYANCE WITH "iSENSE" ENERGY CHAINS AND SENSORS IN BUCKET WHEEL EQUIPMENT

Talwandi Sabo Power Limited (TSPL) is a coal-fired power plant in Banawala, India. They use stacker reclaimers in their bulk material handling to mine and load coal. The coal-fired power plant is used to generate energy. Since the stacker is central to the continuous operation of the power plant, failure is not an option.

Stacker reclaimers are a combination of two different machines where the stacker transports the coal to a heap, and the reclaimer sends it to the power plant's boiler as required.

In order to travel to different locations on the track, the entire stacker reclaimer travels on a huge 700m rail route. A cable reeling drum moves the cable guide of the machines and power supply. The energy supply system is connected via various components, e.g., a motor,

gearbox, switch, slip ring, and bearings. With all of these pieces of machinery, repeated maintenance measures have become indispensable for the operator. Additionally, the outer jacket of the exposed high-voltage cable (11kV) would often be damaged by the coal transported in the plant. To combat the damage, the cable diameters were increased. This led to greater weight, causing cable sagging. The weight also burdened the drive of the cable drum, and as a result, it ran unreliably, leading to voltage problems in the cables. The damages to the cables and cable drum led to unreliable operation of the system and high maintenance costs.

The Igus Solution

Due to the repeated problems and increased downtimes of the plant, the operator made enquiries for a solution. A project to overhaul the cable guidance

system was launched by the operator together with an igus project team. Over several months, the team covered the entire process, from project design to the installation of the new cable guide. At the core of the new solution is a huge energy chain with a travel of 670m. After extensive testing, the E4/4 type 5050RHD roller energy chain - was selected as igus energy chain guides and protects the cables against external influences.

In order to provide additional security for these dimensions, the entire cable guide is supplemented by smart plastics, i.e. intelligent sensors known as iSense modules, in combination with energy chains.

iSense modules ensure continuous condition monitoring by sensors measuring the prevailing push/pull forces

along the chain. The data is evaluated via a module in the switch cabinet and can perform actions, such as shutting down the system if a limit value is exceeded. Damage to the cable guide is prevented before it occurs.

Overall, the interplay of energy chain, chainflex cables and sensors resulted in a solution that provided a major leap forward in terms of plant availability, durability and safety during operation. The plastic energy chain saves weight, simplifies cable guidance and saves the operator high maintenance effort and costs. To discover how to save on maintenance, discuss your next project with the Treotham representative in your state. **AMR**

Eliminate downtime and increase machine availability with iSense smart plastics from igus

▲ Tech up

- Increase machine availability and maximise service life
- Better fault analysis thanks to real-time machine data acquisition
- Easy to integrate into Industry 4.0/smart factory concepts

▼ Cost down

- Eliminate unplanned downtime and machine failures
- Reduce maintenance costs with early warnings
- Implement condition-based maintenance



Scan here for application examples



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Treotham

WESTRAC CELEBRATES 20 YEARS OF SERVICE

WesTrac is celebrating 20 years of service and support in NSW and the Australian Capital Territory, with more than 16,000 Cat machines delivered during this time.

When WesTrac became the official Cat dealer for NSW and the Australian Capital Territory, work began immediately on fitting out the first purpose-built branch in Bathurst, NSW.

Today, there are 18 WesTrac branches across NSW and the Australian Capital Territory, six click and collect lockers and more than 1500 staff members providing services to more than 6500 customers a year.

WesTrac NSW and Australian Capital Territory chief executive Adrian Howard commented on the milestone.

"From when the first Cat tractors arrived in Sydney almost a century ago, products

(Image source: WesTrac) WesTrac has delivered more than 16,000 Cat machines to the mining and construction industries in the past 20 years.

manufactured by Caterpillar have played a pivotal part in the growth of our cities, regions and driving Australia's exports ever since," he said.

"Over the past two decades, WesTrac has been at the forefront of delivering Cat machines and products to meet rising demand, especially within the construction and mining industries."

During these 20 years, WesTrac has shifted its focus to emerging technologies and sustainability.

"Over the past 20 years, our customers needs have changed and demands on business operations have increased with the rapid uptake of technology and rise in 24/7 working environments," Mr Howard said.

"We've come a long way since 2004 and change is only going to keep occurring faster – our goal is to stay at the forefront of technology and innovation to ensure our customers continue to succeed from owning and operating Cat equipment."

AMR



KOMATSU: WA'S FIRST ELECTRIC HYBRID WHEEL LOADER AT ONSLOW IRON PROJECT

(Image source: Mineral Resources) Komatsu E1850-3 electric hybrid wheel loader.

WA's first electric hybrid wheel loader has arrived on site at Mineral Resources' (ASX: MIN) Onslow iron project.

The hybrid loader, which is set to undertake load and haul activities at the project, features the full regenerative SR hybrid drive system which feeds power back into the kinetic energy storage system during braking or retarding.

This process helps deliver up to 45% less fuel consumption than comparably sized mechanical drive wheel loaders.

Loader fit out was completed at the Komatsu workshop in Welshpool with CSI Mining Services, a subsidiary of Mineral Resources, constructing the loader bucket.

The loader was then transported to the Ken's Bore mine site by a 13-line platform and trucks spanning a combined length of 55m.

Mineral Resources executive general manager asset management Dale Blyth says the Komatsu E1850-3 is the biggest loader the company has acquired.

"MinRes is committed to investing in the latest technology to power our transition to net-zero operations, while still achieving operational efficiencies," he said.

"Our new Komatsu wheel loader does exactly that, producing substantially less carbon emissions compared to mechanical drives while still delivering higher payloads."

The Onslow iron project is one of the largest iron ore projects in Australia and is set to redefine mining in WA.

It is forecast to ship around 35mtpa of iron ore with an expected mine life of more than 30 years.

As part of achieving net zero operational emission by 2050, MinRes will displace diesel with alternative fuels, renewable solar power generation, energy storage and electrification of mobile equipment and transport at Onslow.

Additionally, road train batteries will be charged with renewable solar and gas-fired energy while greener mining fleets options are examined. **AMR**

10 YEARS AT THE TOP

FIND LEVELTEC AT STAND A350 AT THE QUEENSLAND MINING & ENGINEERING EXHIBITION FROM JULY 23 TO 25.



Leveltec has been designing and manufacturing tilt switches in Australia since the 1980s but in 2013 the company expanded to become a trusted partner and service agent for a number of world class brands, offering customised solutions for bulk handling control across the mining, steel and Ports industries. They have grown from initially providing switches and hardware to building and implementing systems to monitor the flow of bulk solids, gather data through mainly wireless networks and provide failsafe shutdowns in emergency situations.



2024 marks the company's 10th anniversary and they are set for exciting new levels of growth and product development in the near future.

Tilt switches are used in bulk materials transfer applications to trigger alarms arising from blocked chutes and conveyor failures at transfer points. Leveltec's Australian made switches require no electronics to operate. Their contacts switch on extra low and low voltage, up to 250V AC. As a simple device with high IP ratings and encapsulation. This makes them suitable for use in potentially explosive or hazardous environments when they are used in an intrinsically safe circuit.

There are also internally dampened tilt switch options, designed to reduce the likelihood of false tripping in high vibration or high wind applications. Leveltec's unique design incorporates a strong, smooth body to resist the buildup of materials and resist wear.

"What our device [Leveltec tilt switch] does is provide an economical, reliable, and

robust way of monitoring the stockpile levels," Leveltec managing director Ben Stokes said.

Mr Stokes added that Leveltec's tilt switches are asked for by name by all multi-national mining companies right across Australia.

10 Years of Operation

Leveltec's 10th anniversary celebrations also mark their 10th year as a total solutions provider, offering custom systems developed and installed to suit every client's specific needs. They put boots on the ground and visit every site to establish the client's exact requirements and to observe, first hand, any challenges that must be overcome. From there Leveltec are able to draw on their stable of world class products, their experience in the industry and their ability to create both wired and wireless solutions for onsite monitoring and data collection. True turnkey solutions backed up with onsite maintenance.

"In 2013 it [Leveltec] split off from a

group of companies and decided that it was going to start manufacturing its own items for the Australian local market but also with the dreams of becoming a big company and exporting products all over the world," Mr Stokes said.

"We increase service by holding good stock and product and being versatile by being able to mix and match and change to meet market conditions quickly," Mr Stokes added.

Currently based in Gloucester, in regional NSW, Leveltec's next phase of growth will be to expand into WA in order to have a local base to service its mining clients in the west.

After 10 years, Leveltec have integrated proven technology with well-constructed systems to deliver a new level of service and efficiency for their clients. The future looks bright. **AMR**

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Celebrating 10 YEARS

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(L-R) Linguist Dr Angela Terrill, QCoal Foundation chief executive Sylvia Bhatia, Jangga Elder Col McLennan and archaeologist Liz Hatte.

QCOAL FOUNDATION: PRESERVING THE YANGGA LANGUAGE

Members of the Jangga community recently gathered in Townsville, Queensland, to launch the

Let's Talk Yangga Language Resurgence Project, developed with the support of the QCoal Foundation.

Wodjawodja bimbi Yangga, Let's Talk Yangga, is the culmination of a nearly 18-month collaboration to safeguard the rich cultural and linguistic heritage of the Jangga people in Central Queensland.

Revered Jangga Elder, Col McLennan, the last fluent speaker of his language, worked closely with linguist Angela Terrill and archaeologist Liz Hatte, powered by the support of the QCoal Foundation, to meticulously document the Yangga language so it remains a living and thriving language for generations to come.

The project involved recording the Yangga language, mostly on country, and the creation of resources to preserve the language for future generations.

It will facilitate dispersing and teaching of the language to future generations of Jangga people with the aim of ensuring the language's overall survival.

A *Let's Talk Yangga* website is capturing Uncle Col's profound knowledge to prevent the loss of the language and spark its resurgence.

The website will serve as a repository for the Yangga language and help foster a meaningful connection for the Jangga people to their cultural heritage.

It will contain the names of plants whose characteristics may include food, implements and weapons, medicines and ritual and spiritual elements.

Vocabulary will be presented in dictionary format with images to enhance meaning and understanding.

The website will also include pronunciation guides and recordings of Uncle Col saying the words and singing the songs.

Uncle Col says he is very proud to be part of this project.

"As a senior Elder of the Jangga people and a fluent speaker of the language, I want to pass on my knowledge to the younger generations to keep the language alive," he said.

"Language is a critical component of culture and I hope the project will develop a greater sense of identity and pride in Jangga culture and increase the likelihood of our culture surviving and regenerating.

"Once I started working on this project, I was able to remember more words and songs so I am grateful for the support to capture these for our people."



Jangga Elder Col McLennan and Jangga children.



Jangga Elder Col McLennan shows Jangga community members the *Let's Talk Yangga* website.

QCoal Foundation chief executive Sylvia Bhatia says the QCoal Foundation is delighted to support *Let's Talk Yangga*, which fills a key gap in the capture of language from Jangga country.

"Until now there was only very limited recording of the language so we commend the Jangga team and senior elder Colin McLennan for their work to bring this project to fruition," Ms Bhatia said.

"We hope this website will be an important learning tool for current and future generations of Jangga people and will enhance the preservation of their culture and stories."

Dr Terrill says *Let's Talk Yangga* brings together much of what is known of the language in one website.

"We see situations of language loss of First Nations languages all over Australia, but we also see so many examples of strong languages, and languages being preserved and reawakened all over the continent," she said.

"Thanks to Colin's amazing memory we are able to record information on the Yangga language that would otherwise be lost.

"It is a privilege to have the opportunity to record the Yangga language, to pass on the knowledge to future generations and keep the language alive."

UNESCO has declared this decade the International Decade of Indigenous languages, to focus on the importance of preserving the world's rich cultural heritage.

QCoal Foundation supported the project with a \$15,000 Community Growth grant. Since early 2023, experienced linguist Dr Angela Terrill has been recording the language (including songs) with Col McLennan.

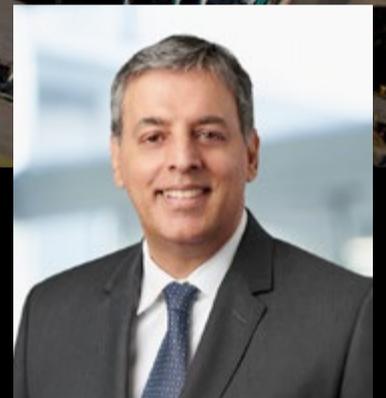
Much of the language recording was completed on Jangga country. In addition, a trip to a local primary school's Indigenous Garden to survey recent language-related activity was a rich source of inspiration on the relationship between language and culture.

The language is now known as Yangga as that is understood to be the original name and aligns with the correct pronunciation. The people and country are known as Jangga. **AMR**

Orica's Kooragang Island in NSW.



WORLD-LEADING CLEANTECH MCI CARBON BREAKS GROUND AT ORICA SITE



Orica managing director and chief executive Sanjeev Gandhi.

Australian clean technology developer MCI Carbon today held a foundation ceremony for its carbon capture and utilisation (CCU) plant 'Myrtle', currently under construction at Orica's (ASX: ORI) Kooragang Island site in NSW.

Funded by a \$14.6m Federal Government grant, the plant is aimed at scaling up the development and demonstration of an engineering process called mineral carbonation, which transforms captured carbon dioxide (CO₂) emissions into building products and other valuable materials.

The technology has the potential to provide a cost-competitive solution for decarbonising hard-to-abate industries

globally and contributing to the circular economy.

Orica managing director and chief executive Sanjeev Gandhi says the innovative project, which is expected to be operational by 2025, aligns with Orica's sustainability and commercial goals.

"The energy transition requires careful planning and policy coordination between governments, regulators, energy suppliers, consumers, and the broader private sector," he said.

"This ceremony today is a great example of business and government working together to drive innovation for a better

tomorrow, as we transition towards a lower carbon future, together.

"We are proud to partner with MCI Carbon, industry, academia and the government as they scale this important technology."

The CCU plant will source its CO₂ directly from Orica's ammonia manufacturing facility, capturing around 1,000t of the greenhouse gas annually.

In addition to supplying the feedstock, Orica has supported the project by providing land, access to utilities, and significant technical expertise.

Partnering with MCI Carbon is the latest

example of Orica's commitment to decarbonising its operations.

Recently, the company completed a \$37m project to install tertiary abatement technology on the Kooragang Island site's three nitric acid plants, reducing greenhouse gas emissions by nearly 50%. That equates to 11% of all chemical process across Australia.

The tertiary abatement project will continue to eliminate 567,000t of CO₂ equivalent from the site each year, which is equal to the emissions from 50,000 homes. **AMR**

RIO TINTO MANAGER OF RANGER REHABILITATION

Under a new management services agreement (MSA), Rio Tinto (ASX: RIO) will manage the Ranger rehabilitation project in the Northern Territory on behalf of Energy Resources of Australia (ERA).

The MSA will build on ERA's existing rehabilitation work with Rio's technical expertise in designing, scoping and executing closure projects.

Transition to Rio Tinto's management will begin immediately and is expected to take around three months.

Under the agreement, Rio and ERA will aim to complete the Ranger rehabilitation project in the safest and most efficient

way, and to a standard that will establish an environment similar to the adjacent Kakadu National Park.

Rio chief executive Australia Kellie Parker commented on the partnership.

"With the signing of this agreement, we are pleased to be able to directly provide more closure and project delivery experience and know-how to this critical task," she said.

"So far, ERA has made progress in key areas, including water, tailings treatment and management and pit rehabilitation.

"We are aligned with ERA in wanting to build on this work using Rio Tinto's expertise in

closure projects and our commitment to strong stakeholder relationships."

Rio will build on the expertise and existing relationships within the ERA team to finalise required studies and execute the necessary rehabilitation activities.

Outside of the Ranger rehabilitation project, management of ERA matters, including cooperate matters, financial affairs, assets and governance will remain the responsibility of ERA.

ERA chief executive Brad Welsh says the company is looking forward to working with Rio.

"The ERA team has worked incredibly hard



Rio Tinto will manage the Ranger rehabilitation project in the Northern Territory.

and made good progress rehabilitating Ranger," he said.

"However, as the project moves into a new phase it will benefit from Rio Tinto's global expertise in mine closure.

"We look forward to working with and supporting Rio Tinto on the safe and efficient delivery of this important project."

AMR



FUTURE-FACING FACILITY



Simon Stone, VP Asia Hexagon. Photo: Hexagon.



Photo: AARP.

A new world-class Australian automation and robotics testing facility serving the mining sector is continuing to expand as a range of organisations, from Tier 1 miners to startups, increasingly utilise the site outside Perth.

The Australian Automation and Robotics Precinct (AARP) was established by the WA Government with a goal to create a collaborative environment that nurtures the development of cutting-edge technologies and techniques to accelerate sector-wide growth and competitiveness.

Test and development activity at the site ramped up significantly in 2023 and is set to continue to grow in 2024 with the opening of the Precinct Headquarters later this year.

Automation and robotics in Australia's mining sector is expected to add \$74b and create 80,000 new jobs by 2030 and the 51ha site in Perth's northern suburbs is already playing a key role in the sector's transformative process.

AARP's national project lead Tamryn Barker says initial interest and uptake has been positive with one Perth-based robotics startup undertaking its first paid trial with a Tier 1 miner following a successful testing programme at the Neerabup centre, about 35km north of Perth.

"This is a big deal, being able to validate significant new technologies with customers at the site and derisk the process on both sides," she said.

Industry uptake

The startup, an emerging WA hard tech developer specialising in designing and manufacturing automated robots to improve productivity and safety in the mining sector, was able to showcase its tech at the AARP in real-world conditions instead of conducting demonstrations at a Queensland mine site.

As an early-stage startup, utilising the

AARP provided the company with low-cost access to test beds, as well as facilitated engagement with potential customers and opportunities to showcase its products at monthly Demo Days at the site, according to Ms Barker.

HydraTune chief financial officer Peter Campbell says his company, a remote hydraulic tuning company, is also realising the benefits of the AARP beyond the ability to test and develop technology at the site.

"To collaborate with other companies and access world-class facilities so close to the city, is so valuable to us," he said.

The collaborative aspect extends beyond startups comparing notes, with established operations and Tier 1 miners increasingly utilising the AARP.

Hexagon is another high-profile company taking advantages of the WA location and onsite testing facilities offered by the AARP.

Hexagon VP Asia Simon Stone says the company is excited to be part of the AARP. "We've done testing and a demonstration here with Mineral Resources to their investors and the media which went super well," he said.

"When you introduce autonomy and innovation like this into an organisation we need to take people along for the journey.

"Creating that right culture, creating a feeling of excitement for this innovation is really important.

"And this is a great facility to help you - everyone is learning here.

This is where we're going to develop what we need, for these machines to be able to make decisions on their own and operate safely, and importantly, to get the hours up to ensure people are comfortable with the tech and to bullet-proof it from a safety and robustness point of view."

"As announced in July 2023 by our chief



The AARP test landscape suits a range of needs along the mining value chain. The largest test bed, the Dirt Lab – Innovation Mine spans over 220,000m². Photo: AARP.

THE FUTURE OF AUSTRALIAN MINING IS TAKING SHAPE AT WA'S NEW HIGH-TECH TESTING CENTRE

executive Paulo Guglielmini, our project with Mineral Resources is the largest single contract Hexagon has ever done," he said.

"We are seriously investing inside WA, having recently opened up a new office in the Perth CBD to accommodate 150 staff and establishing a substantial light industrial facility with around 30 specialist autonomous staff close to the AARP.

"So why WA? The iron ore industry in WA is really well-established. But the ore bodies that are now available are further apart.

"The economics of taking drivers out of the cab is transformative. It makes dirt that was of no economic value, really valuable.

"And especially as there are no drivers available, this brings opportunity for creating new, high-value jobs.

"The disruptive technology of light touch, long haul transport of iron ore is creating an economic resource in Western Australia that wasn't there before and is opening up new revenue streams for the State to invest in schools and communities.

"This technology has applications across Australia. It has applications across industry, including mining, military and agriculture."

Ideal location

Australia is already a world leader in the application of industrial robotics and automation technology, with the Pilbara

region of WA home to almost 75% of autonomous trucks operating globally and the world's largest and longest autonomous trains hauling iron ore from pits to ports.

Leveraging this momentum, the AARP provides companies from diverse industries with seamless access to an innovative environment, essential tools, and comprehensive training required to develop, test, and showcase automation and robotics products and processes.

Launched in October 2021 by DevelopmentWA, the AARP, part of the WA Government's Diversify WA strategic framework and operated by CORE Innovation Hub under the management of DevelopmentWA since 2022, provides six test bed environments which allow companies and researchers an opportunity to accelerate industrial technology development by testing and scaling without interrupting normal production activities, in addition to other facilities.

Multiple test beds

The AARP test landscape suits a range of needs along the mining value chain, in particular exploration and discovery, drill and material movement. The largest test bed, the Dirt Lab – Innovation Mine spans over 220,000m² and has been designed to facilitate activity in these areas:

- Develop: use the test beds to develop and test new mining technologies, such as automation and robotics

systems, before real-world deployment in operations.

- Demonstrate: use the test beds and facilities to demonstrate and train customers on the capabilities and benefits of their existing products, helping to increase sales and market penetration.
- Commission: use the test beds and leasehold lots to commission, optimise and integrate new equipment into their operations, reducing risk and increasing efficiency and productivity.
- Train & Educate: use the Precinct as an industry training hub and where universities can conduct research and provide hands-on learning opportunities for students, giving them exposure to cutting-edge mining technologies and techniques and embedding PhDs in industry projects.

The AARP are also shaping up a collaborative New Energy Zone, which will host infrastructure and activity co-designed with industry. This will include advancing work on the transformative role of automation and electrification; a development ecosystem for robotics and renewable capability with a solar array installation and maintenance area and charging infrastructure for industrial vehicles and energy storage and distribution. In turn, the New Energy Zone will support off-grid capacity to power other users across the precinct, for a truly sustainable hub and catalyst for green tech innovation in heavy industries and beyond.

Other test beds include a Flex Zone for flexible and adaptable technologies in various applications, including drone and smaller ground-going robot operations; a Heavy Zone with a banded perimeter for safe testing of heavy vehicles and large field robotics; an Urban Zone with a test track to help accelerate the pace of urban and light industrial mobility and safety systems and solutions and a large technology showcase area for curated demonstrations and open days, bringing customers and stakeholders close to emerging technologies.

The future of AARP

Over the next three years, the AARP will be further developed, with a state-of-the-art Common User Facility operation building, research and development facilities such as laboratories and design co-labs, and advanced test beds with multiple areas and roadways for physical testing.

Construction is also underway on the Precinct Headquarters, expected to be completed mid this year.

The flagship building will feature co-working offices, research, development, and display areas.

It will also include laboratories, training and workshop facilities accessible to users, partners, and guests, and will be powered by emission-free solar power connected to a battery and microgrid network.

Leasehold lots are currently available on-site for test activities which provide direct access to the test bed areas and can be used for equipment laydown or storage.

The AARP, one of the biggest facilities of its kind in the world, also hosts monthly Demo Days to allow potential users and industry stakeholders to learn more about the project and technological developments.

To find out more visit:
<https://www.thearp.com.au/>

AMR



Hexagon demonstration and testing activities at the AARP with Mineral Resources. Photo: Hexagon.



Photo: Hexagon.

ESG

environmental, social & governance



In this second instalment of the six-part environmental, social and governance (ESG) series, the ***Australian Mining Review*** continues to look at innovative solutions and industry leaders around native title, supply chains and dust management.

This edition, we speak with:

- **National Native Title Council** chief executive Jamie Lowe about the importance of meaningful partnerships between mining companies and local Traditional Custodians
- **Curtin University** Associate Professor Dr Elizabeth Jackson on sustainability in supply chains across the mining sector
- **Glencore Coal** and how it is managing dust and air emissions while improving air quality in the regions it operates
- **DMI65** on water filtration technology
- **Coolmist** on the AJET Mist Cannons for dust mitigation
- **Dust Control Management Services** on using Camfil Cartridge Dust Collectors to ensure the best air quality underground
- **Enviro-Mist** on using high pressure dust suppression systems to reduce dust in difficult environments such as coarse ore stockpiles and ROM bins
- **Aerison** on providing custom-designed solutions to optimise air quality and protect the environment and worker health
- **MIDECO** on Aqua Bat for a safer, greener and most cost-effect dust extraction method
- **Environmental Control Systems** on the FOAM DUST SUPPRESSION SYSTEM for preventing dust becoming airborne
- **Dust A Side** on dust control and dust suppression management systems for roads
- **Liquimix** on protecting the environment against harmful chemicals with polyurea

COLLIE BUSINESS LEADING THE WORLD IN WATER TREATMENT TECHNOLOGY

In 2001, Clive Hawkes and Keizo Suzuki founded Quantum Filtration Medium in Bunbury, WA, with a mission to revolutionise water filtration.

Their groundbreaking product, DMI65®, tackled stubborn contaminants like heavy metals without harsh chemicals, marking a significant advancement in water treatment.

DMI65® isn't just another filter media; it is a game-changer. Engineered with

their novel infusion technology to tackle heavy metals such as iron and manganese, using less chemicals and eliminate the use of potassium permanganate.

These days operators are using DMI65® to remove toxic substances like arsenic and lead.

It promises a transformative solution to some of the most pressing water quality challenges facing communities globally.

With DMI65®, Quantum gained traction locally, earning trust from clients such as Saint John of God and Bunbury Health Campus.

However, recognising the need to expand globally, Quantum ventured into Southeast Asia with support from Austrade.

Despite challenges, their filtration

solutions, powered by DMI65®, gained widespread recognition in the region, establishing Quantum as a leader in water treatment technology.

As global water concerns intensified, Quantum expanded its export markets to over 100 countries, including India, China, USA, and Africa.

In 2023, backed by the WA Government, Invest and Trade WA, South West Development Commission and greater Collie community, they began constructing the DMI65® factory in Collie, WA, with completion expected this year.

The factory, boasting advanced automation and safety measures, will produce over 25,000 metric tonnes of filtration media annually in its first phase.

It promises to create new jobs, promote sustainability and contribute to the circular economy.

The completion of the DMI65® Factory signifies Quantum's commitment to innovation and environmental responsibility.

It heralds a new era in water filtration technology, celebrated globally.

As Quantum continues to inspire future generations, DMI65® remains a beacon of hope for clean and sustainable water solutions. **AMR**



In 2023, backed by the WA Government, Invest and Trade WA, South West Development Commission and greater Collie community, Quantum Filtration began constructing the DMI65® factory in Collie, WA, with completion expected this year. The photos were taken of the construction in March.



"Thank you to Invest & Trade WA, South West Development Commission and the Greater Collie Community for supporting Quantum Filtration Medium"

New Quantum Filtration - DMI65® Media Factory Opening 2024





Dhawura Ngilan

BUSINESS & INVESTOR INITIATIVE



RAISING THE BAR

ON FIRST NATIONS CULTURAL HERITAGE PROTECTION

Business and investment leaders have taken a pivotal step by committing to a new best practice standard in the management of Aboriginal and Torres Strait Islander cultural heritage.

The *Dhawura Ngilan Business and Investor Guides* were launched in Canberra on March 19 by the First Nations Heritage Protection Alliance (FNHPA).

Dhawura Ngilan means 'Remembering Country' in the Ngunnawal Language.

The Guides are inspired by, and take the name from, the *Dhawura Ngilan* Vision, drafted by Heritage Councils across the country with the backing of the FNHPA. This Vision sets the course for First Nations heritage over the next decade.

Dhawura Ngilan offers practical steps for the mining industry to integrate local knowledge and cultural heritage practices throughout a mine's lifecycle.

FNHPA co-chair and Ngalia cultural and community leader Kado Muir says the launch of "the *Dhawura Ngilan Business and Investor Guides* heralds a new period in Australia's business relations, with commitment from the private sector to reach beyond legislative standards and implement leading practice for cultural heritage as defined by First Nations peoples".

With businesses and investors stepping up to integrate the *Dhawura Ngilan* Vision within their operations, over the next 12-18 months key businesses and investors, including BHP, will implement the Guides to put the First Nations-led advice into action.

BHP president Australia Geraldine Slattery says "we are grateful to the First Nations Heritage Protection Alliance for their leadership in this initiative and we look forward to working with Aboriginal and Torres Strait Islander partners to further embed the *Dhawura Ngilan* vision".

BHP is providing \$1.2m in funding to support the Initiative's workplan, with Lendlease, HESTA, KPMG Australia and Perpetual also supporting.

Federal Environment and Water Minister Tanya Plibersek delivered a keynote speech at the launch.

The FNHPA is currently working with the Federal Government to co-design new national cultural heritage legislation due to serious deficiencies in the current legislative framework.

The Minerals Council of Australia (MCA) welcomed the launch in a statement.

"The Initiative underscores the importance of collaboration between industry and Traditional Custodians in preserving, protecting, and promoting at least 65,000 years of cultural heritage," the statement said.

"The MCA embraces the principle that effective heritage management requires both relationships and regulation.

"The *Dhawura Ngilan Initiative* represents a unique opportunity for the sector to contribute to the vision of preserving Aboriginal and Torres Strait Islander heritage for future generations."

The *Dhawura Ngilan Business and Investor Guides* comprehensively outline the steps businesses should take to uphold the principles of Free, Prior and Informed Consent (FPIC).

They also address the due diligence investors should undertake to manage the legal, financial and reputational risks associated with First Nations cultural heritage destruction.

The Guides were drafted by Terri Janke & Company, a 100% Indigenous owned and run law firm, in consultation with First Nations, business and investment groups.

Led by FNHPA, in partnership with the UN Global Compact Network Australia (UNGCNA) and the Responsible Investment Association Australasia (RIAA), the *Dhawura Ngilan* Business and Investor Initiative supports the private sector to have meaningful and rights-respecting engagement to protect Aboriginal and Torres Strait Islander cultural heritage.



Q&A WITH NATIONAL NATIVE TITLE COUNCIL CHIEF EXECUTIVE JAMIE LOWE

The National Native Title Council (NNTC) is the peak body for the native title sector.

Its members are made up of the Traditional Owners of Australia's lands, waters and resources and their representative bodies.

The Council advocates for the rights and interests of Traditional Owners through strong advocacy, targeted networking and by providing opportunities to members to develop their professional skills to engage across the native title sector.

The *Australian Mining Review* speaks with NNTC chief executive Jamie Lowe about the importance of fostering meaningful partnerships between mining companies and local Traditional Custodians.

AMR: How do native title, the mining industry and ESG intersect within Australia?

JL: For mining to take place on native title land, a mining company generally needs to negotiate with native title holders in relation to the impact of mining activities and reach agreement on the protection of significant cultural heritage sites, financial compensation, and employment and training, amongst other things. For

the NNTC, socially and environmentally responsible mining involves respecting First Nations peoples' right to true self-determination – their right to speak for and manage their own Country, to govern their own communities, to participate fully in decision-making and to self-determine their own social and economic development. This right is protected under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Environmental, social, and governance (ESG) criteria are a set of principles that investors use to assess companies' performance through the lens of sustainability, including to assess companies' social licence to operate. Businesses are increasingly focussed on these metrics as they can be crucial to receiving loans, grants, and other funding. The integration of ESG into the operations of businesses can encourage better engagement with First Nations communities and protection of their heritage as ESG frameworks directly impact how mining projects are planned, financed, constructed, operated, and decommissioned.

AMR: What is the First Nations Heritage Protection Alliance?

JL: The First Nations Heritage Protection Alliance is a coalition of member organisations representing First Nations peoples from across Australia – including major Native Title, Land Rights, Traditional Owner and Aboriginal and Torres Strait Islander community-controlled organisations. It seeks to strengthen the laws policies and procedures around

the recognition, respect, protection and celebration of First Nations Cultural Heritage in Australia. The strength of the Alliance comes from the breadth and diversity of our membership and the unified position we seek on heritage protection matters. It strives to enhance the capacity of First Nations peoples to fully manage and control their Cultural Heritage, fostering self-determination to benefit culturally, spiritually and economically.

AMR: What is the impact on business of not addressing cultural heritage risks?

JL: Businesses and investors can face grave consequences, including financial, legal and reputational damage if they fail to adequately address cultural heritage risks. The destruction of First Nations cultural heritage has a deep and often irreversible impact on communities and to the world's heritage. Respecting the right of First Nations people to decide what happens on their Country in accordance with their right to Free Prior and Informed Consent (FPIC) and building long-term constructive relationships with First Nations communities is directly linked to a mining company's long-term success. Significant financial costs stem from project cancellations, delays, legal fees, reputational damage etc. Investors need assurance that the companies in which they invest are mitigating this risk by respecting First Nations heritage.

FPIC is a specific right for Indigenous Peoples, enshrined under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), to give or withhold consent to a project that may affect them or their territories. FPIC enables Indigenous Peoples to negotiate the conditions under which the project will be designed, implemented, monitored and evaluated.

AMR: Who are the partners and supporters of the *Dhawura Ngilan Business and Investor Initiative*? How do you envisage the Initiative being rolled out?

JL: The *Dhawura Ngilan Business and Investor Initiative* is led by the First Nations Heritage Protection Alliance. We are working on this Initiative in partnership with responsible investors and businesses, including the Responsible Investment Association Australasia (RIAA) and UN Global Compact Network Australia (UNGCA). We enlisted the support of Terri Janke and Company to draft the guidance through consultation with various stakeholders. BHP, Lendlease, HESTA, Perpetual, and KPMG have provided financial support to the Initiative.

Over the next 12-18 months key businesses and investors will implement the Guides to put the First Nations-led advice into action. The ultimate goal is for sustainable "business as usual" implementation of the *Dhawura Ngilan Vision*. We hope the Australian mining industry will integrate the Principles and Guides including in their policies, strategies and operations throughout a mine's lifecycle. The Guides are also important for governments, particularly when they act as project proponents and funders, and we are engaging with government departments and financing agencies to discuss implementation of the guides. Finally, the Guides are important for First Nations communities as they provide a tool for them to hold companies and investors to account on the steps that need to be taken regarding free, prior and informed consent.

For further information about the Initiative, visit: <https://culturalheritage.org.au/how-we-work/>



NATIONAL NATIVE TITLE COUNCIL CHIEF EXECUTIVE JAMIE LOWE

Jamie Lowe, a proud Gundjitrara Djabwurrung man, first joined the National Native Title Council (NNTC) as Chair in 2017. Two year later, he was appointed CEO, charged with supporting First Nation's people's right to true self-determination in advocating for their right to speak for and manage their own Country; to govern their own communities; to participate fully in decision making and to self-determine their own social and economic development.

In 2021 he was appointed as the Indigenous Specialist Representative for the Australian Heritage Council – the principal adviser to the Australian Government on heritage matters.

In July 2018 he joined the Victorian Heritage Council as an Indigenous Specialist Representative and is a joint council member of the Coalition of the Peaks. Jamie was instrumental in the Closing The Gap Agreement with the Federal Government, that came into effect July 2020.

Prior to joining NNTC Jamie was CEO of

Image: NNTC CEO Jamie Lowe Photography Studio Australia

the Eastern Maar Aboriginal Corporation in South Western Victoria, awarded Native Title in 2011. Today he represents the Eastern Maar People as an elected representative on the historic First Peoples' Assembly of Victoria, the representative elected body tasked with negotiating a Treaty with the Victoria Government.

Internationally, Jamie is the NNTC representative on the United Nations Permanent Forum on Indigenous Issues (UNPFII) – a high level advisory body to the New York based UN Economic and Social Council.

As a key influencer, Jamie firmly believes that creating economic independence and maintaining and growing cultural identity are vital in creating a self-determining nation of First Nations peoples, and will continue to tirelessly advocate for a national Treaty whilst remaining a strong advocate for Traditional Owners and communities across Australia.

Highly regarded by the media, Jamie is regularly interviewed across all ABC, SBS and NITV platforms, The Financial Review, The Age, The Sydney Morning Herald, The Australian, The Western Australia, WA Today and Indigenous media platforms.

SUSTAINABLE SUPPLY CHAINS

Q&A WITH

DR ELIZABETH JACKSON,

ASSOCIATE PROFESSOR OF SUPPLY CHAIN MANAGEMENT AT CURTIN UNIVERSITY



Dr Elizabeth Jackson is an Associate Professor of Supply Chain Management at Curtin University and is a global supply chain expert in road and maritime transport, agri-food supply chains including textiles such as wool, cotton and hemp, as well as circular supply chains such as recycling.

(CONTINUED FROM FRONT COVER)

AMR: Can you give us a brief overview of the disruptions that have been happening to the global supply chain over the last four to five years?

EJ: Everything in the commercial world and supply chain world seemed to be going smoothly until the COVID-19 pandemic. It's the pandemic that has unhinged so many local, national and global supply chains. It's been a series of events, since the pandemic, that really triggered this cumulative impact on supply chain performance, particularly in Australia, where we're seeing often catastrophic climate events – for example, massive fires and floods – that are disrupting our supply chains and our ways of manufacturing and transport. Take, for example, the military conflict in Ukraine and the Middle East, related hostility in the Red Sea – these

military events seem to have arisen quite close together, comparatively speaking, from before the pandemic. We've also seen the frequency of industrial action, as well, and how all of this is linked to financial, economic and societal events. Since the pandemic, we have had cost of living crisis, rising inflation, the lack of availability of products and the rising cost of key business inputs for industries, like agriculture and mining, such as diesel and fuels that power industries. These are all cumulative events and issues. Many of them are not new issues, for example, military conflicts, industrial action and climate changes have been happening for a long time. But it's the fragility that we experienced during the pandemic, that hasn't allowed us to catch up with our "business as usual" process and these events have really amplified the impact on how supply chains work in numerous industries, including mining, agricultural, the primary industries, building and construction – all industries that are very reliant on imports.

AMR: How are supply chains adapting to these disruptions, particularly after the COVID-19 pandemic?

EJ: What we're seeing globally is supply chains are trying to get shorter. The pandemic made us stop and think about the length of our supply chains and how it adds complexity to the sourcing of goods and services. There was an incident in 2013 in the United Kingdom where horse meat was found in products that were labeled as frozen beef lasagna. This was a watershed moment, putting supply chains under the microscope, in terms of authenticity of products and the trust consumers had in these products. If a mining company orders a drill bit that is made of titanium, it trusts that it is made of titanium and not something else. The spotlight that the COVID-19 pandemic shone on supply chains was how exposed we were to global transport systems. Australia, as an island nation, has prospered from international

trade, with many of our local manufacturing industries shut down because of the ease and cost efficiencies of global trade. When our trade links are cut off for any reason, we become very exposed. So the way supply chains are now adapting is that they are looking to source goods from closer to home. There has been a marked shift in reliance, particularly globally, away from Chinese manufacturing.

The COVID-19 pandemic really taught the world that we were over reliant on Chinese manufacturing. There is a difference in commercial values between China and Western countries. This really shocked the world and big companies like Apple, for example, have been developing strategies to source from Asia and in particular Southeast Asia. They've been going to countries like Vietnam, India, Indonesia and Malaysia to try to be more agile and have more control over where their products are sourced from.

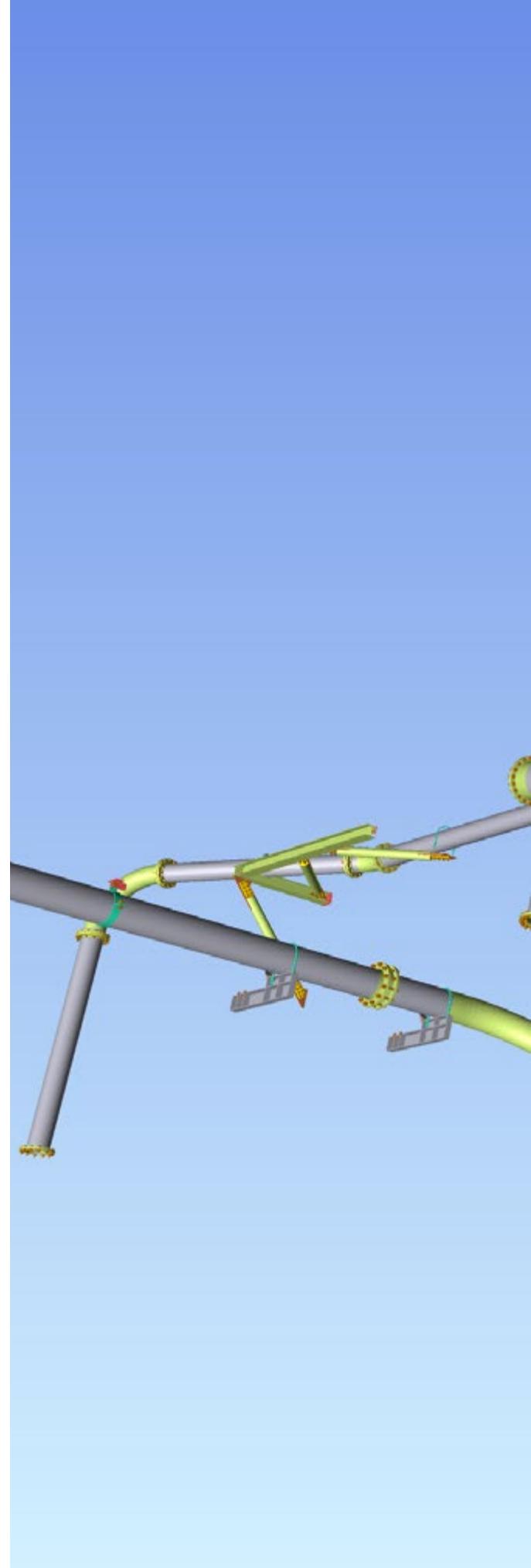
AMR: What role do governments play in Australian supply chains?

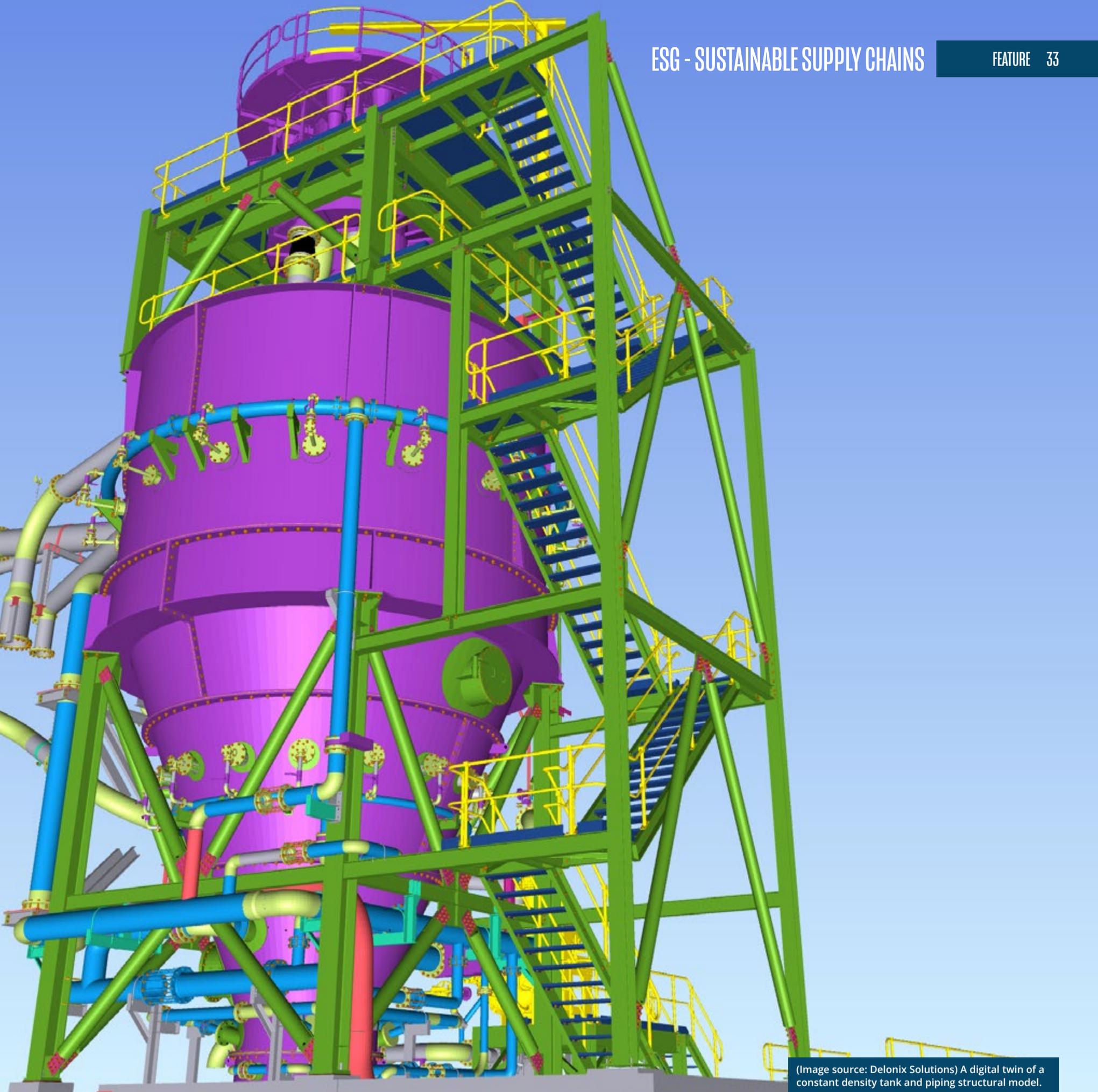
EJ: The Federal Government is pivotal to supporting supply chain activity. It might appear on the surface that supply chain activity is a commercial, industrial aspect of society, but supply chains are also reliant on so many government-owned assets, for example, road, port, rail and air transport infrastructure. Government ownership of transport infrastructure is very important. The other important role that governments play is with their licensing and approval. It is being argued amongst industry circles that current government policy is too strict and does not allow businesses to do what businesses need to do to keep being

commercial. Policies must enable supply chain growth and development.

AMR: Where does technology fit amongst supply chains right now?

EJ: There are many different types of players in the mining industry – the big players who have big balance sheets, high costs, high revenues and high turnovers. But there are also a lot of smaller businesses and consultancies that are often family businesses, for example, the small family-owned transporting companies that service the mining industry. There is a range of adoption of supply chain technologies to improve the supply chain activity in the mining industry. Big mining businesses are extremely advanced with adopting artificial intelligence, machine learning for predictive maintenance programs with seamless ordering of parts and maintenance requirements through very sophisticated computer technology. For example, the adoption of





(Image source: Delonix Solutions) A digital twin of a constant density tank and piping structural model.

blockchain technology makes sure that product authenticity flows through the supply chain. This is very important in mining products that are sourced within Australia and countries that don't have as good and sophisticated environmental and social governance (ESG) around the

“THE ADOPTION OF BLOCKCHAIN TECHNOLOGY MAKES SURE THAT PRODUCT AUTHENTICITY FLOWS THROUGH THE SUPPLY CHAIN.”

mining practices that Australia does. When we sell a bag of lithium from Australia, we can be sure that it is a very ethical product. We need to be able to

demonstrate that and blockchain is a technology that can do it. There's another technology that's coming up in the mining industry called digital twins, a mechanism for simulating scenarios. This is great in supply chains for planning and product delivery – it is value added through the supply chain. Technology is a great investment for doing things better. The downside, however, is that they come at a cost. Against the background of an economic environment with big inflation, big diesel prices and high labour costs, small operators in the mining sector could be criticised for not adopting this technology quickly. But there are very good reasons for that, which are associated with the cost of doing business at present. The adoption of technology in the mining industry is a fascinating case study on

what is currently happening and how technology can help, if businesses can afford it at present.

AMR: In what ways can supply chains help improve ESG in mining?

EJ: The big ESG issues at the moment in supply chains nationally is the reporting of Scope Three emissions. These are essentially the emissions that come from supply chains and how goods are moved through the through supply chain. The reporting of Scope Three emissions for mining businesses is becoming increasingly important because of government pledges, not only within Australia, but to the world, that Australia will achieve carbon neutrality by 2050. The Federal Government is starting with big business, which includes some mining companies, amongst others in Australia. They are starting to report on their emissions. Those obligations will filter down to smaller businesses as the emissions

reporting policy becomes phased in across all business types. It is important to start with gaining control of Scope Three emissions reporting. The reason that this is the place to start with is because ESG Scope Three emissions reporting provides a framework for not only what a business does, but also what its business partners do. A lot of people think that supply chains is just moving goods from one place to another. The philosophy of supply chains, which a lot of people don't understand, is that it's a value creation process. A good example is in the mining industry, where you take something out of the ground as raw material, then change or morph it into a computer chip or a piece of metal. Supply chains are, in the most sophisticated way, the collaboration of businesses that have different roles in the manufacture of a particular good or product. Those businesses share values about what they want to produce for a particular consumer. Another example is that the Mercedes Benz supply chain



has very different values than the Toyota supply chain. While they both manufacture vehicles, the Mercedes Benz supply chain will have a very different attitude towards how suppliers and buyers collaborate amongst each other to provide products that are suitable for Mercedes Benz quality vehicles. That's not to say that Toyota is

“BRAND AUSTRALIA IS EXTREMELY POWERFUL.”

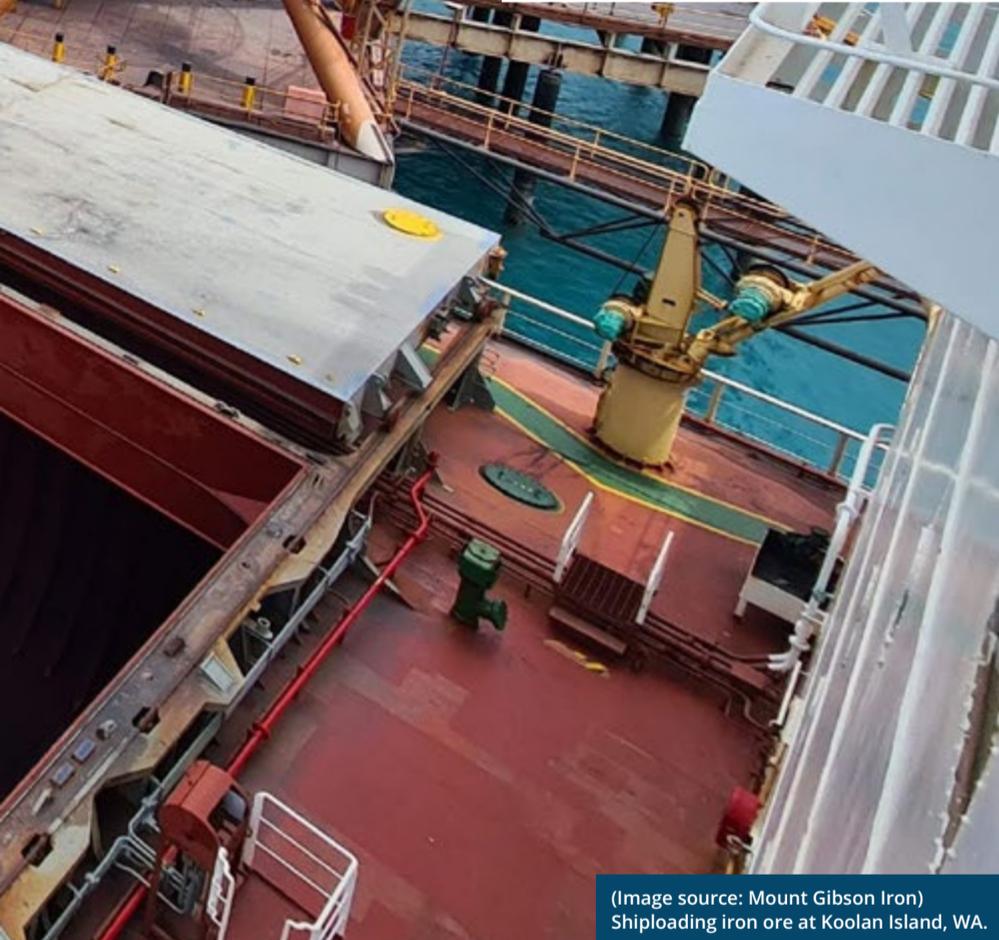
any worse. They're just different – they're servicing different markets. It's this collaboration between players in supply

chains that's going to be important to Scope Three emissions reporting and the identification of collaborative relationships in supply chains. In the mining industry, the importance of identifying modern slavery in supply chains is a very important part of ESG. Responsibility comes under “Social” and “Governance” in ESG. What we saw was a lot of mining companies and indeed, textile companies, sorting through their global suppliers to make sure that there was no modern slavery in their supply chains. That forced manufacturers and retailers to put their suppliers under the microscope by getting to know their suppliers and clearly communicating to them that modern slavery does not align with Australian values. This is going to be the same with emissions reporting into the future – and all aspects of the E, the S and the G moving forward in supply chains.

AMR: What can Australia do to improve its own internal supply chains?

EJ: The adoption of technology is going to ease pressures. However, as I said earlier, this does come at an enormous cost. It is going to be difficult, particularly the very small organisations, as they're going to need support. That support will need to come from the government, in terms of investment, but also from industry organisations and peak industry councils through the provision of information and support to their members in facilitating that change. The other one is how governments deal with the progress of industry and commerce – and the investments that they're prepared to make. It also requires taking a very hard look at the imposition of red tape and compliance that is quite often perceived by industry as being a significant imposition to the progress of commerce right throughout the supply chain. Another one is this idea of shortening supply chains and doing what is possible to invest and purchase inputs either within Australia or closer to





(Image source: Mount Gibson Iron)
Shiploading iron ore at Koolan Island, WA.

“OUR SUPPLY CHAINS HAVE BEEN ENGINEERED, OVER A 30 OR 40 YEAR PERIOD, TO BE EXTREMELY PRECISE.”

home. If there are relationships that can be developed within Australia or closer to home – and I'm thinking Southeast Asia, Indonesia, Malaysia, Vietnam. What I'm advocating is risky, it can be expensive but, at the same time, disruptions are also very risky and can do a lot of damage. The closer to home we can have our manufacturing and service provision, it is a good thing. It is making our supply chain more resilient – not only bouncing back from adversity but, what I would say, bouncing forward from adversity. So when there is a disruption, we come out of it in a better state than when we went in.

AMR: What are your suggestions on improving global supply chains?

EJ: I would suggest trying to source closer to home. I understand the difficulties of sourcing within Australia and the costs that it incurs. However, sourcing closer to home in Southeast Asia, looking at supply chains and how they can be made more agile, in terms of where import products are sourced from, I think this is important

and quite interesting from the perspective of breaking the rules. Supply chains over the last 30 or 40 years have been working very hard to minimise costs and waste. Waste in the mining industry means, for example, machines sitting idle for too long, stock in warehouses sitting on shelves for too long. Over the last four or five years, with supply chain disruptions that we have been experiencing and the ongoing issues that we're facing with climate disruptions, the inclement and disruptive weather events are occurring more in remote regions, where a lot of mining companies have their heartbeat, it's making us realise that these rules that we've been working so hard to establish over the last 30 or 40 years may not be so great. We need a little bit of wiggle room and a little bit of fat in our supply chains to buffer against these disruptive events that seem to be occurring more and more frequently. An example is spare parts on a shelf. Many companies have strict KPIs about the length of time spare parts are on the shelf. We have to start easing up on those rules because they're doing a

disservice, in terms of being able to keep our flows of products going so that we can service our customers.

AMR: Which industries or customers are most impacted by supply chain disruptions, apart from mining?

EJ: The building industry, the agriculture industry and the automotive industry. What characterises these industries is that they are desperately reliant on imports from overseas. With the building industry, materials such as wood, iron and steel come from distant markets. With the agriculture industry, materials such as diesel, fertilisers, pesticides and chemicals come from overseas and, perhaps, value-added in Australia. Conflict in the Ukraine had a terrible impact on fertiliser manufacture, for example, not necessarily because that's where fertiliser comes from but because of the availability of gas, which is a major component of fertiliser manufacture. So it's not necessarily the product, but it's the secondary components of the manufacturing processes that are equally important as well. These types of industries are reliant not only on inputs, but processes that go into input manufacture from abroad, which have made us extremely vulnerable.

AMR: What is the impact on Australia if there are further supply chain disruptions?

EJ: As an island nation, we are at the mercy of availability of big cargo ships that import and export our raw materials. We must be able to have access to maritime transport as it's the only method of transport that can take the quantities of products that we need. It is also the most environmentally responsible method of transport. It is also a method of transport that can take dangerous goods. Air transport is too small, expensive and environmentally

unfriendly. When we don't have access to those ships, we start to get a backlog of product and, when that product is stored for too long, it starts to take up valuable warehouse space. Our supply chains have been engineered, over a 30 or 40 year period, to be extremely precise with how much space we have available for stock. If the stock can't leave our country, it starts to take up space, leading to a stop in the manufacturing process. This happened during the COVID-19 pandemic and we started to lose money and reputation. A lot of countries come to Australia and engage in commerce with our country because we are a reliable and ethical supplier of raw materials. Brand Australia is extremely powerful. The minute our supply chains fail, we can't provide our overseas customers with what they need in the quantities and qualities of products that they require. They have become used to Brand Australia. This is why I would argue we need a little bit of fat in the system to keep supplying our overseas customers in the manner that they have been accustomed to.

AMR: On a final note, what are some of the big trends in supply chains now?

EJ: The big trends for supply chains in high-income economies are sustainability, ethical production systems and ethical supply chains that do the right thing by people, the planet and the environment. It is about trying to strike a balance between keeping society in the privilege place that it has become used to but achieving that in a way that is going to meet all those ESG requirements. That is the major challenge at the moment for global supply chains in high income economies. And is that going to happen? I would suggest through the adoption of technology and through support for, particularly, small and small-to-medium-sized enterprises.

AMR

BREATH OF

Mining is dusty work with operational and human activities generating both large and small dust particles.

Left unchecked, these activities which include bulldozing, dragline removal of overburden, shovel excavation, blasting, vehicles travelling on unsealed roads, vehicle exhaust and emissions, could have harmful effects on health, the local community and environment.

Particulate matter, or PM, describes the range of particles or dust that exists in the air we breathe and could be made up of acids, chemicals, metals, soil, dust or allergens.

PM is measured in micrometres or microns across the diameter of a particle, with larger particles (more than PM10) remaining in the throat and nose, lesser than PM10 entering the lungs through inhalation and PM2.5 potentially entering the bloodstream and air sacs deep in the lungs.

On a larger scale, various industrial processes such as the running of power stations, farming activities, use of wood heaters or smoke from bushfires also increase particulate matter in the air.

There are understandably community concerns around visible dust, particularly from open cut mining operations, as well as the health impacts of finer particles.

Health effects include irritated eyes, nose and throat, worsening symptoms of asthma and lung diseases, heart attacks and arrhythmias for short term exposure (hours to days) and reduced lung function, development of cardiovascular and respiratory diseases, increases rate of disease progression and reduced life expectancy in long term exposure.

Vulnerable sections of the population, particularly children, the elderly and those with respiratory or heart conditions, including diabetes, are more susceptible to the health effects stemming from increased dust and air pollution.

Glencore Coal is one of the largest coal producers in Australia, with operational mines across NSW and Queensland, has been taking huge strides towards dust control and air emissions at its sites.

With a commitment to mining responsibly and managing potential impacts from its operations, Glencore Coal has been proactive in implementing systems and procedures to the benefit of the local communities and ensure compliance with environmental conditions.

The company effectively manages air quality issues using real-time monitoring, transparent reporting and emerging technologies to assess its operations' actions and performance.

Glencore Coal is also playing a leading role in its

work with neighbouring communities, peak industry groups and regulatory authorities to study and respond to potential cumulative air quality impacts on the regions in which it operates.

Air Quality Management Protocol

Glencore Coal's Air Quality Management Protocol provides sites and projects with clear guidelines on what is required to ensure best practice dust management.

Key initiatives by Glencore Coal include:

- minimising its active mining footprint to the smallest area practicable by promptly rehabilitating disturbed areas;
- installing over 100 real-time air quality and noise monitors, both on-site and within our neighbouring communities;
- using continuous dust monitors, with pre-determined levels triggering an alarm to notify mine supervisors to review operations;
- using environmental cameras to monitor operations and dust levels;
- running 24-hour hotlines for residents to report concerns, and initiating immediate investigations into each complaint received; and
- altering or stopping operations at open cut mines in adverse weather conditions.

Air Quality Control System

An air quality improvement project initiated by Glencore Coal in 2010 identified procedural and



(Image source: Glencore) Air quality and noise monitoring is an important part of operations at Glencore.

FRESH AIR

engineering measures to be implemented for improvements in air quality management, with additional tools investigated including camera technology and the ability to forecast conditions to assist in planning operational activities.

What transpired was the Air Quality Control System (AQCS), a fully automated system that provides personnel with information on daily environmental risks associated with air quality, noise and blasting.

Glencore Coal implemented the AQCS at all its open cut coal operations across NSW with the aims of improving the management of environmental impacts at each site.

The program, introduced in 2012, is believed to be a first for the coal mining industry in the NSW Hunter Valley.

It is part of broader project to improve air quality management across its coal operations and minimise impacts from blasting, air quality and noise at each open cut mine site.

The AQCS provides a daily email with information for each site that is used together with extensive air quality and noise monitoring to plan daily mining activities.

Based on years of research across Australia and

overseas, including detailed analysis of concerns associated with air quality, the AQCS presents the following information in its daily emails:

General forecast: a general five-day weather forecast to provide a broad indication of upcoming conditions for weekly mine planning purposes;

Winds: wind conditions for the next two days, as hourly predictions, with changes in wind speed and/or direction used to inform the timing of specific activities such as blasting;

Dust: prediction of daily dust risks, represented as an air quality index consistent with the Office of Environment and Heritage (OEH) air quality index, which indicated the likely higher and lower risk areas, in terms of dust, to inform planning around work areas and intensity of activities; and

Noise: predicted of noise risks at specific locations, showing if the weather conditions are likely to increase or reduce noise at a particular location, relative to the mine, over the next two days, with these predictions used to inform decisions on timing of noise generating activities.

There is also a dedicated website for Glencore staff to better understand the detailed information used in the daily environmental forecast summary email.

The program was awarded the NSW Minerals Council's 2013 Environmental Excellence Award.

Benefits of the AQCS include:

- environmental issues given more focus with forecasts tabled and discussed at daily pre-shift meetings;
- increase in the number of employees empowered with responsibility for environmental management;
- productivity improvements due to identification of favourable environmental conditions; and
- modifications to mining activities as appropriate to the environmental risks.

Workplace education for dust management

Glencore Coal strongly believes its employees play an important role in managing dust at its open cut mining operations, so much so that dust and noise management is a compulsory element of its workplace training.

Training simulators using specially-designed software are used to test the knowledge and skills of its operators in identifying issues and responding appropriately when it comes to dust management.

This includes requests for additional water carts or even stopping operations if required.

The aim is to control dust at the source before it becomes an issue for the local communities. **AMR**



(Image source: Glencore) Simulators are being used to educate Glencore Coal's workforce on dust management.



DUST SUPPRESSION ON OPEN CUT MINE SITES

Open-cut mining is a common form of extraction for minerals in Australia. The major reasons for open-cut mine operators to seek solutions for dust suppression across large areas are worker health and safety, environmental protection and the protection of neighbouring communities.

Dust generated by material handling or fragmentation is difficult to manage in small confined areas and it is considerably more challenging in extremely vast areas.

In these scenarios, it is vital to select equipment that is very adaptable and can adjust to a variety of conditions. Effective dust suppression solutions need the ability to switch between fixed and mobile systems in order to reach all points across a large area.

The best solution for dust suppression in open – pit mines

AJET Mist cannons are the ideal method for properly suppressing dust generated in iron ore, gold, nickel, copper, coal, bauxite, cement, lime or asphalt producing facilities.

The mist cannons technological and innovative features have a significant advantage in the combination of low or high water pressure and a channeled air flow capable of producing a high concentration of nebulised water droplets. This allows the mist cannons to operate in a wide range of conditions, suppressing even the smallest dust particles across broad areas. Another significant benefit is energy efficiency: water usage remains extremely low in comparison to the surface area being treated.

Strategic placement of dust suppression systems

CoolMist Systems Australia offer solutions for an entire site, focused on minimising

and mitigating dust to reduce health risks and protect environmental impact on areas of heritage and cultural significance.

“Strategic placement of equipment can deliver the most effective outcomes”, says Managing Director Kim Smith. “Our technical specialists can assist in determining the best points where equipment should be deployed.”

Once the areas of concern are identified, the correct size and configuration of the AJET mist cannon/s can be recommended. These are often located in areas where items are in free fall, such as loading and unloading sites, processing, crushing or transport. Depending on the location and / or operational constraints, static fogging lines and other fogging equipment may be recommended.

AJET Mist Cannons

CoolMist Systems Australia's wide range of AJET Mist cannons are versatile and offer technical attributes to meet all requirements. All machines adapt to work in open areas and inside buildings.

Our range includes:

- Semi-automatic mist cannon dust suppression machines
- Electronic mist cannon dust suppression machines
- Customised mist cannon dust suppression machines

Common features to AJET mist cannon dust suppression systems feature:

- Powerful throw distance from 20 metres up to 90 metres. Cannons with 150 metre throw are available on request
- Cannon rotation angle up to 340 degrees, tilt range from -15 to +50 degrees
- Nozzles orifices are adaptable to the customer's working requirements

- Optional: QRM (Quick release manifold) nozzle crown allows quick interchange of blocked nozzles and minimises machine downtime
- A touch screen control centre for easy programming of the machine
- Electronic rotation of the fan which is separated from the machine body for simple and intuitive management. This allows for installation with the fan positioned at height with the control instruments on the ground
- Optional Variable Frequency Drive (VFD)
- Radio remote control
- Self-priming multistage vertical electric pump

Possible configurations include:

- Fixed base with electro-welded and hot galvanised steel platform
- Three (3) wheeled trolley for maneuverability on site
- Hydraulic articulated arm gives users the ability to reach points that other dust suppression systems might find off limits
- Cannon mounted on a pole
- Cannon mounted on a wall
- Customised configurations to client's requirements

Customised AJET Mist Cannons

When standardised solutions are not compatible with the site situation, CoolMist solutions go beyond standard systems providing customised and proprietary equipment to help mitigate the dust issues on site.

Tanks, generators and cannons can be configured with any combination suitable to offer a solution to meet client requirements.

Mounted on flatbed trucks, trucks with roll-off system or on trailer for towing, these options make an ideal dust suppression

system that can be used in worksites in continuous movement and where there is neither water nor electricity.

Recently an AJ30-CM was installed in a semi-enclosed rom bin space. Because the electronic rotation of the fan can be separated from the machine body, the cannon was positioned at height with the PLC Control panel, pump and filtration system on the ground. This made it easier for the operator to regulate the machine even in the most difficult situations, allowing it to operate safely, securely and effectively. The operator is extremely satisfied with the results as the dust generated has been suppressed to a negligible level.

For more information, sales, rentals or demonstration, contact CoolMist on 1300 266 564 or visit www.coolmist.com.au.

AMR



EFFECTIVE DUST CONTROL WHEN YOU NEED IT



Dust control over large open areas and inside buildings is vital to protecting your operation & staff.

CoolMist® Systems customised misting systems provide an affordable dust suppression solution in areas where extraction is not possible or cost-efficient.

Since 2005, we have supported numerous clients with our tailored dust control solutions.

Our industrial dust suppression misting systems are used throughout Australia in mining operations, waste transfer facilities, recycling facilities, bulk processing facilities, excavation, and construction sites, building demolition, and asbestos remediation work.

For professional advice, design, installation, and service contact:

Phone:
1300 266 564

Email:
sales@coolmist.com.au

or visit our website:
www.coolmist.com.au

CoolMist
SYSTEMS AUSTRALIA

OPTIMISE DUST CONTROL WITH DUST MANAGEMENT SERVICES

With a rich legacy of over 35 years, DMS stands out as the industry leader in designing, manufacturing, and installing top-of-the-line dust extraction and collection systems across diverse sectors. When it comes to comprehensive dust management solutions, we're your trusted partner.

Since 2012, DMS has been at the forefront of introducing groundbreaking products to the Australian market. From cutting-edge dust collectors to innovative wind fences, wet scrubbers, fog dust control systems, and beyond, we continuously raise the bar in environmental technology.

Our impressive track record speaks volumes about our unwavering commitment to reducing emissions and creating healthier, safer workplace environments. At DMS, we don't just meet standards; we exceed expectations with every solution we deliver.

BHP Port Hedland Wind Fence

We're incredibly proud of our standout achievement: playing a pivotal role in the groundbreaking BHP Port Hedland Wind Fence project. This project truly highlights our dynamic collaboration with industry giants like WeatherSolve Structures and GHD Consultants, where we've

come together to deliver cutting-edge environmental solutions.

As experts in designing and manufacturing industrial, recreational, and agricultural environmental control systems, WeatherSolve Structures brings a wealth of knowledge and expertise in handling extreme environmental conditions, ranging from hurricanes and cyclones to intense heat and cold. Their projects span across thousands of acres globally, featuring perimeter fences reaching heights of up to 30m, and even taller when necessary.

These innovative wind fences are meticulously crafted to withstand cyclones, utilising mesh panels that effectively reduce wind speeds and safeguard BHP's stockpiles, significantly minimising the risk of dust lift-off. With wind speeds decreased by up to 60% and fugitive dust reduced by an impressive 84%, these fences boast fabrics that undergo rigorous aerodynamic porosity testing. The Port Hedland wind fence project stands as a testament to our commitment and capabilities, representing a multi-million dollar endeavour for DMS.

Fog Dust Control

DMS, in collaboration with our esteemed

technical partner, The Raring Corporation (TRC), is at the forefront of supplying cutting-edge ADS™ dry fog dust collection systems. These systems are not only highly efficient and patented but also environmentally friendly, using minimal water, no chemicals, and causing negligible moisture increase in materials.

Our dry fog dust collection technology has gained significant traction, being deployed across multiple BHP sites and experiencing rapid expansion within the mining sector. Our latest achievement includes a groundbreaking project with the Mid-West Ports Authority in Geraldton, where we've implemented a state-of-the-art ship loader fog system.

Teaming up with The Raring Corporation (TRC), we're revolutionising dust collection across industries, offering innovative ADS dry fog systems that deliver efficient, chemical-free solutions while minimising moisture impact on materials. Our patented technology has earned accolades for its remarkable ability to reduce dust levels by up to 90%.

Dust Extraction for Newmont Mining

We're excited to announce our collaboration with Newmont on cutting-edge underground ventilation filtration

systems. This partnership showcases our expertise in dust extraction, utilising state-of-the-art Camfil Cartridge Dust Collectors to ensure the very best air quality underground.

Working With CECO Environmental

DMS proudly collaborate with industry giants like CECO Environmental, leveraging their expertise in wet scrubbers, cyclones, and other clean air technologies to bolster our environmental stewardship. Our joint efforts have led to significant reductions in emissions across multiple industries.

More information on CECO Environmental can be found at www.cecoenviron.com

Our Services

For comprehensive dust and fume extraction solutions, structural wind fencing, industrial vacuum systems, and more, contact DMS today to optimise your workplace environment. Let's work together to create a cleaner, safer workplace for everyone.

For more information visit
www.dustman.com.au

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DUST CONTROL SYSTEM DESIGN, SUPPLY & INSTALLATION AUSTRALIA-WIDE



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OUR SERVICES

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- ✓ ADS™ Fog Dust Control Systems
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- ✓ Structural Wind Fences
- ✓ Industrial Vacuum Systems
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ENVIROMIST DUST SUPPRESSION TECHNOLOGY

Exposure to respirable dust in mining environments has been shown to lead to lung diseases such as pneumoconiosis (i.e. silicosis), and cancer as well as pulmonary diseases. The Occupational Health and Safety Act and associated regulations - both state and federal - put the onus on mine owners to reduce the risk to both workers and the environment from dust emissions.

EnviroMist is a leading developer and supplier of High Pressure Dust Suppression Systems capable of significantly reducing dust in difficult environments such as ROM Bins and Coarse Ore Stockpiles without affecting ore moisture levels. EnviroMist utilises its R&D findings to implement systems that determine the actions/mechanisms which cause dust creation and then develop solutions to suppress the dust by injecting billions of micron sized droplets to the most appropriate locations. In ROM Bins this normally involves creating a pressure curtain which resists penetration by the air generated during truck dumping operations. COS systems involve positioning the sprays

and increasing the nozzle exit velocity to intersect falling material streams at a location where the material stream separates due to gravitational acceleration. The challenge with COS systems is to design the system to operate efficiently in adverse wind conditions which render low pressure dust suppression systems ineffective.

Research has shown that to effectively capture an airborne dust particle with a water droplet the water droplet diameter needs to be of similar size to the dust particle. When water droplets are much larger than dust particles, the dust particles are less likely to be captured. Most low pressure dust suppression systems cannot reduce the droplet size sufficiently for efficient dust capture, and therefore require the injection of large volumes of water to improve dust capture efficiency. This leads to downstream material handling issues, as ore streams become oversaturated. EnviroMist high pressure systems create an average droplet size of approximately 38 micron - meaning that these systems produce 7 trillion water

droplets in a standard truck dump cycle, yet only consume approximately 200 litres of water per dump cycle. The large number of droplets produced, along with their positioning within the confines of ROM Bins significantly increases the chance of dust capture therefore reducing fugitive dust emissions from the Bin.

Design developments from a recent project have shown that EnviroMist spray bars and nozzles can also operate on much lower pressures without significantly increasing droplet sizes. The main advantage of lower pressure systems is that energy consumption is reduced compared to high pressure systems, but as the exit velocity (or energy) of the water is significantly reduced, lower pressure systems require a higher number of nozzles to resist the air flows from dumping operations and still effectively capture dust emissions.

A recent project at Peabody Energy's Wambo mine resulted in significant reductions in respirable dust around the working areas of the longwall. An existing spray system was replaced with a custom

designed EnviroMist spray arrangement which utilised existing pumps on the longwall for spray water supply. Water consumption levels for the design limited water consumption to a maximum of 63 l/min at the highest operating pressure. After installation and adjustments during commissioning of the system, an independent testing company determined respirable dust level reduction of between 60-80% when compared to the original spray system operations. The impressive results are a result of the combined efforts of the Mine Engineering Team and EnviroMist Engineers.

EnviroMist systems have been applied to many types of ore and operations - from longwalls and other Coal handling equipment in underground mines, ROM Bins and COS stockpiles in Coal surface mines, Iron Ore mines in the Pilbara region, and materials handling equipment within hard rock mining operations.

For more information visit
www.enviro-mist.com.au

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AERISON: LEADING AIR POLLUTION CONTROL IN THE RESOURCES INDUSTRY

In the dynamic landscape of the mining industry, where health, safety, and legislative compliance are indispensable, Aerison stands out as the definitive provider of premier air pollution control solutions. With over 40 years of pioneering achievements, Aerison is the Australian leader in the delivery of innovative environmental control solutions, directly addressing the multifaceted health and legislative challenges that face the sector today.

Aerison's comprehensive range of solutions is engineered to not only meet but often surpass industry standards, championing environmental stewardship and the protection of worker health. This unwavering dedication makes Aerison your pivotal ally in navigating the complexities of the legislative landscape, ensuring operations are in line with stringent emissions standards and worker safety protocols.

Tailored Solutions for the Resources Industry

Acknowledging the unique pollution control challenges within mining, Aerison specialises in custom-designed solutions. From baghouses and wet scrubbers to fog-based management systems and industrial wind fences, Aerison boasts the in-house expertise required to tackle the most rigorous demands. This bespoke approach ensures that every Aerison solution aligns precisely with the specific needs of each project.

Beyond deploying turnkey environmental solutions, Aerison's commitment extends across the entire lifecycle of your asset. This includes maintenance services for both new (greenfield) and existing (brownfield) projects, alongside detailed engineering assessments and consultations, all designed to enhance efficiency, compliance and safety over the long term.

A rich history of delivering over 600 pollution control solutions to Australian Industry

Aerison has earned the trust of industry giants, including BHP, RTIO, FMG, Alcoa, Newmont, Talison, Norther Star, to a broad spectrum of multiple EPCMs and emerging market participants. Our project portfolio spans a range of commodities such as iron ore, gold, lithium, nickel, copper, manganese and other rare earth metals. Leveraging our broad expertise, we are adept at evaluating dust management challenges and crafting solutions that

enhance emission control effectiveness while ensuring value for investment.

Innovative Technologies & Comprehensive Solutions

At Aerison, we pride ourselves on delivering a wide range of advanced pollution control technologies, both through our own innovations and in collaboration with esteemed partners such as Donaldson, Ducon environmental and Dust Systems International. Our comprehensive approach ensures that we can offer solutions that cover every aspect of environmental management, combining the best of Aerison's products with the specialised capabilities of our tech partners.

Our Dry Filtration and Collection Capability:

- **Large Industrial Baghouses:** Custom-designed to handle various dust loads and particle sizes, these systems are essential for industries generating significant particulate matter, offering robust and reliable filtration at 99.95% efficiency.
- **OEM Cartridge and Baghouse Systems:** Utilising cutting-edge filtration technology from partners like Donaldson, these systems employ sophisticated media to effectively capture a wide range of dust and fume types, ensuring cleaner air output and enhanced worker safety.
- **Dry ESP** – Electrostatic Precipitators are an industrial filtration device that removes fine particles like dust and smoke from gas flows. Aerison have delivered several high efficiency ESP solutions in Australia.
- **High-Efficiency Cyclones:** Using centrifugal force to remove larger particles from gas streams, Aerison have pioneered and customised cyclones which can be used as standalone dust separation systems or part of an initial multi-stage emission control solutions.

Wet Particle Collection Technologies:

- **Wet Scrubbers:** These systems are designed for efficient particulate removal from flue gases, using water or other liquids to capture dust before it can escape into the atmosphere.
- **Chemical / Gas Scrubber – Packed Towers:** Utilising various chemical reactions, these scrubbers remove harmful compounds like sulfur dioxide, acid mists and ammonia from industrial emissions, supporting

regulatory compliance and environmental protection.

- **SCR DeNOx & VOC Systems:** Selective Catalytic Reduction units are critical for reducing nitrogen oxides (NOx) and volatile organic compounds (VOCs) in exhaust gases, using catalysts to promote chemical reactions that break down these pollutants.
- **Wet Electrostatic Precipitators:** Similar to their dry counterparts, wet ESPs use electric fields to remove contaminants, particularly effective in moist or sticky conditions where traditional ESPs might falter.

Dust Suppression:

- **Mist Spray Technology:** Direct application of water can be a highly effective solution for dust suppression, and Aerison have been delivering highly effective turn-key solutions including pump skids, water distribution piping, instrumental panels and specialised nozzle selection. We have you covered from crushers through to your conveyor stack outs and storage piles.
- **Dry - Fog Technology:** Fog-based dust control systems are innovative solutions designed to manage and mitigate airborne dust particles in industrial environments. These systems reduce water usage and use various techniques to create a fine mist or fog of water droplets that effectively captures and settles dust particles from the air.

Other Technologies:

- **Industrial Wind Fences:** Strategically placed barriers that reduce the velocity of wind over open areas, minimising the amount of airborne dust generated from stockpiles and other sources.
- **Regenerative Thermal Oxidisers (RTOs):** These units destroy airborne contaminants, including hazardous air pollutants and volatile organic compounds, by heating them to a high temperature, an effective way to improve air quality and meet stringent environmental regulations.

By combining these diverse technologies, Aerison delivers comprehensive systems that not only meet the strictest environmental standards but also enhance economic efficiency and operational functionality. Our strategic partnerships with leading technology providers amplify our capability to of-

fer tailored and effective solutions, addressing the unique challenges faced by our clients in the mining industry.

Cost of Emission Reduction

At Aerison, we understand that effective pollution control is not just about meeting regulatory standards but doing so in a cost-effective manner. Our holistic approach to dust management means we assess dust issues comprehensively to tailor solutions that offer the best value in terms of \$/emission reduction. By leveraging our extensive expertise and a wide range of innovative solutions, we ensure that our strategies not only mitigate negative health impacts but also optimise economic efficiency, providing measurable value to our clients.

Why Choose Aerison? The Premier Choice for Mining Pollution Control

Choosing Aerison means partnering with Australia's leader in Air Pollution Control who are dedicated to innovation, health, safety and compliance. Here are compelling reasons why Aerison is the superior choice:

- **Over 40 Years of Industry Leadership:** Proven track record of success and innovation.
- **Australian Owned and Operated Business:** A true EPC who can deliver turnkey solutions and ongoing asset management and maintenance services.
- **Custom-Designed and Holistic Solutions:** Tailored to meet the unique challenges across the entire resource industry, Aerison provide solutions focussed on offering the best value for money and taking into consideration the customer constraints.
- **Audits and Consultancy:** Our team are highly trained in various Acts and Regulations, and offer expert assessments to enhance system performance and maintain safety while minimising compliance costs.
- **Strategic Global Partnerships:** Access to global expertise and cutting-edge technology for your benefit.

With Aerison, you gain a partner committed to delivering world-class engineered systems with a steadfast focus on health, safety, and compliance. Aerison's comprehensive approach and innovative solutions chart the path toward a more sustainable and legally compliant mining future. Choose Aerison for a decisive step towards achieving excellence in industrial environmental management.

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AERISON



ONE TEAM SEAMLESS DELIVERY

Aerison is a provider of multi-discipline industrial services to the minerals and mining, oil and gas, non-process infrastructure and utilities sectors.

Key areas of expertise:

- Engineering and Design
- Multi-Disciplined EPC Projects
- Environmental Engineering and Construction
- Fabrication
- Sustaining Capital, Maintenance and Shutdown
- Project Services
- Electrical and Control Infrastructure
- Power Generation Services



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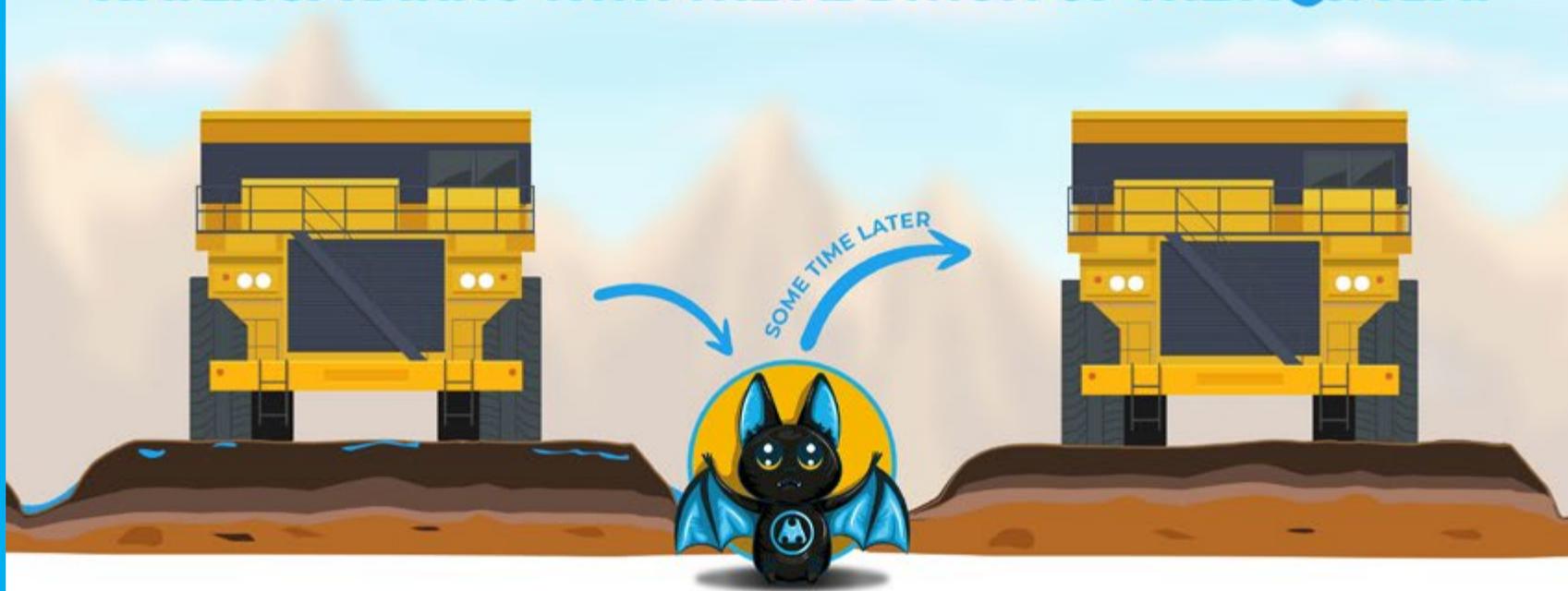


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Australia

FOAM DUST SUPPRESSION

AN INNOVATIVE DUST CONTROL SYSTEM

Environmental Control Systems was formed 15 years ago to provide an integrated design, build and installation service for dust suppression in mining, quarrying and bulk mineral processing and handling facilities.

ECS brings together a wealth of experience and expertise in chemistry and engineering to effectively tackle a longstanding problem of fugitive dust emissions, with site locations in Perth, Adelaide and Mackay to service the country and abroad. Increasingly, operations and communities are seeking solutions to dust pollution especially where it can and should be managed and controlled.

ECS has developed a highly effective FOAM DUST SUPPRESSION SYSTEM that can effectively suppress dust by preventing dust from getting airborne whilst not adding excessive moisture to the material being handled and/or processed.

Dust is an inevitable by-product from the extraction and crushing process at many mine sites and depending on the nature

of the mineral, particle sizes and moisture content, the dust is released into the atmosphere.

To prevent the dust particles from becoming airborne, foam is introduced at specific points in the crushing, screening and conveying process. Using the ECS foam dust suppression system is becoming more recognised as the most efficient way of controlling fugitive dust emissions whether it be on the surface in quarries, open cut mines, ports or underground mines.

The foam works as a dust suppression method, ensuring that the fine dust particles generated in the crushing and handling process do not get airborne therefor stays with the crushed material rather than escaping to the atmosphere. The foam is introduced at selected points in the crushing, screening and transferring circuit.

The foam is created from millions of tiny bubbles and as a dust particle is released from the material, one of the tiny bubbles

is burst, thoroughly wetting the fine dust particle making it heavier and preventing it from getting airborne.

Foam is produced by adding ECS Dustchem 76 foaming agent to water and then introducing compressed air in a controlled way to optimise the quality of the foam. Design and application of the foam is often tailored to each different application with attention paid to crushing capacity, material type and plant layout.

ECS foam dust suppression systems have multiple key advantages compared to alternative dust control systems with the key difference being a foam dust control system prevents dust from becoming airborne in the first place instead of trying to capture the fugitive dust that is already airborne.

Other advantages include:

- Once treated, the dust will remain with the material and will not be released at subsequent transfer points, screens, stack outs or load outs

- Foam systems considerably less amount of water compared to traditional water spray systems
- Foam systems require a fraction of the energy required to run large and cumbersome extraction plants
- Large nozzle openings are used, making nozzle blockages a thing of the past
- Maintenance cost is very minimal
- Provides a safe working environment
- Improves relationships with neighbours
- Help comply with regulations
- Minimal moisture addition – thus ensures effective screening
- Reduces corrosion problems
- Improves product yield/retention
- Application equipment is fully automated
 - Does not require any operator intervention
- Significantly reduces maintenance time and helps prolong equipment life

For more information visit
www.e-cs.com.au or call 1300 957 772.

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You crush the rock, we'll stop the dust

Environmental Control Systems' FOAM DUST SUPPRESSION SYSTEM effectively suppresses dust by preventing it from getting airborne whilst not adding excessive moisture to the material.

Advantages over alternate dust control systems include:

- ✓ Prevention of dust getting airborne
- ✓ The dust remains within the material
- ✓ Less water is used
- ✓ A fraction of the energy is required
- ✓ Large nozzle openings make nozzle blockages a thing of the past
- ✓ Minimal maintenance costs
- ✓ Reduced corrosion problems
- ✓ Provides a safe working environment



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**Environmental
Control Systems**

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Backed by decades of experience, Dust-A-Side Australia has built upon its wealth of project experience, expertise and a global network to offer highly effective dust control, road management, erosion control and dust suppression for multiple industry applications.

Dust-A-Side Australia dust-control management systems move beyond simply applying water to the road surface.

"On most mining, construction or industrial sites, the standard method

of dust suppression is to utilise water. However, the costs associated with relying on water for dust control can be quite high, not to mention wet roads create other dangers, including vehicle instability and slippage." said Shaun Cockman, Dust-A-Side Australia Managing Director

By treating the road with a dust suppressant comprising binder properties, the requirement to routinely re-water the road is removed, which helps mitigate downtime and slippery surfaces.

Furthermore, constantly spraying down haul roads causes damage to the running surface as valuable binding materials may be washed away. This ultimately leads to the formation of potholes that need to be repaired, driving up overall road maintenance and repair costs. This also means downtime which impacts production levels and profitability in the long run.

Not to mention, water application only is ineffective at suppressing dust in high temperatures as it



evaporates quickly, which means clients spend large amounts of money in labour and fuel during the warmest months just to prevent roads and materials from drying out as watering carts need to run around the clock to keep up.

Additional health and safety benefits flow from Dust-A-Side Australia's dust control solutions.

"Whether it's operators in air-conditioned cabs, production and maintenance teams, or nearby communities, we're engaged in reducing visible and respirable dust that

people are exposed to on the ground," said Mr Cockman

Dust-A-Side Australia, a division of the Colas Australia Group, has become synonymous with excellence in Dust Control, Road Management, Erosion Control and Dust Suppression Systems. Founded in 1973 and operating in Australia for decades, we offer unparalleled solutions to mining, civil, infrastructure, quarry, agriculture, rail and heavy industry clients. **AMR**

Find out more, visit <https://dustaside.com.au/>

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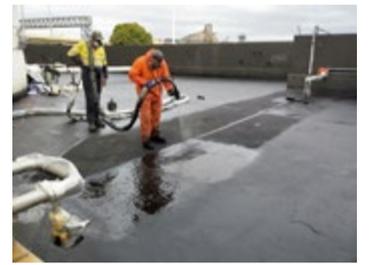
THE CHOICE PRODUCT IN THE MINING INDUSTRY

Billions of dollars are spent by municipal councils and industrial and mining companies to develop infrastructure to process potable water, wastewater, and sewerage. Chemicals created in wastewater and sewerage environments, particularly sulphuric acid, attack the cement, further exposing cracks and deteriorating concrete infrastructure, leading to leaks into the environment. As these assets deteriorate over time, it is essential to find solutions to both repair the damage and prevent further deterioration. Early detection of damage and subsequent treatment and lining will extend the life of the asset while ensuring the safety of the environment.

When it comes to environmentally safe protective coatings in the mining industry, few companies have developed products that will protect the environment, not just the assets. Liquimix specialises in manufacturing protective coatings that protect assets in the mining industry and the environment.

Liquimix's pure polyurea range contains no volatile organic compounds (VOC's), is safe for use in potable water assets, and protects the environment from hazardous chemicals leaking into the flora and fauna. Liquimix's pure polyurea is the preferred product in the mining industry for bund lining, providing primary and secondary containment for chemical tanks, sewerage treatment plants, and wastewater facilities. If one of these assets has a leak, it will leak into the environment, and the damage it will cause will be detrimental to the environment and the people around it.

Tufflon-P80, specifically, has passed AS/NZS 4020:2018 standards and is Australian-made under ISO9001, which makes it the ideal product to protect water assets and pond lining. Tufflon-P80 also offers great chemical resistance, which makes it an outstanding lining solution for secondary containment bunds. Tufflon-P80 has been specified and used widely around Australia and New Zealand in caustic and fuel bunds, especially in the mining sector.



With its zero VOC, faster development of physical properties, and elastomeric nature, Tufflon-P80 is ideal for use with geofabric on unstable substrates or where movement in the substrate is expected soon after application, such as when temperatures drop rapidly during the night. Tufflon-P80 also tolerates higher heat, up to 120°C, allowing hot asphalt to be applied directly over it for a short duration. It is the most recommended product for applications that require a fast return to service while protecting the asset and its surroundings for a proven 20+ years, depending on the service conditions.

Ideal for mining equipment, Liquimix's polyurea, Tufflon-D60, protects tippers, trucks, buckets, and more from being damaged. Tufflon-D60 is specifically formulated for protecting steel assets in harsh environments, steel castings for mining applications, and offshore pylons in marine environments. Its impact-resistant properties make it ideal for heavy transport

steel and aluminium tipper applications. It can also be used as pipeline protection for mining and gas operations, railcar linings, marine applications, and to protect steel assets against wear and corrosion. Which inevitably prevents the need to recycle loads of machinery and equipment, which helps reduce greenhouse gas emissions.

Liquimix is your protective coating partner from start to finish.

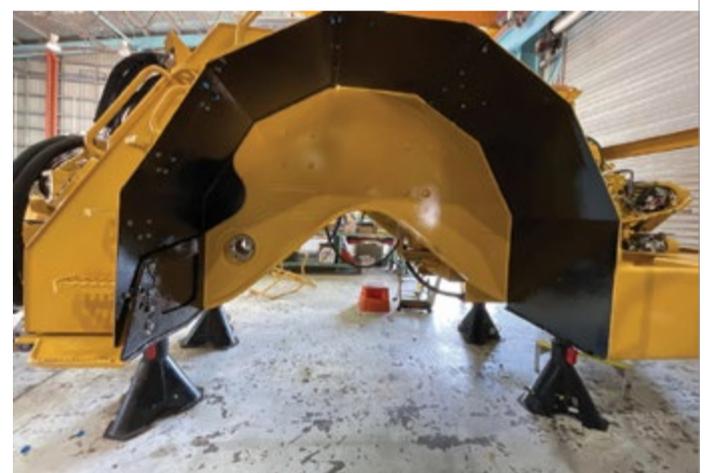
With over 40 years of history (established in 1980), Liquimix has a solid background and a proven system to help protect Australian assets and the Australian environment. With a sole focus on protective coatings, Liquimix offers a wide range of services that complement its great products. The benefits include a full specification and coating technical support services, as well as sales and hire of the Graco Plural equipment used to apply the coatings. We also offer technical training as well as application training to ensure the stakeholders involved deliver quality work. **AMR**

PROTECTING THE ENVIRONMENT AGAINST HARMFUL CHEMICALS WITH PURE POLYUREA



LIQUIMIX

construction chemicals



Our pure polyurea range contains no volatile organic compounds and protects the environment from hazardous chemicals leaking into the flora and fauna. Each polyurea product exhibits outstanding abrasion and corrosion resistance, perfect for use in bund lining, wastewater facilities, chemical tanks and sewerage treatment plants.

Tufflon-P80

- Great chemical resistance
- Fast development of physical properties
- Tolerates heat up to 120°C
- Elastomeric nature

Tufflon-D60

- Impact-resistant properties
- Extraordinary strength
- High adhesion of 14MPa

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AUSTRALIA'S ROCK-SOLID DRILLING INDUSTRY



JEFF MILLER,
ADIA CHIEF EXECUTIVE

(IMAGE SOURCE: ADIA)

Australia's resources industry is a pillar of the country's economy with Australia being one of the largest exporters of coal, iron ore and bauxite. As the demand for materials grows, Australia's drilling industry will play a key role in ensuring supply can keep up with demand.

The *Australian Mining Review* sat down with Australian Drilling Industry Association (ADIA) chief executive Jeff Miller who provided some insight into Australia's drilling industry and its future.

AMR: Can you tell us about the current situation within Australia's drilling industry?

JM: Drilling is a bit of a mixed bag at the moment. There are some sectors that are doing really well and there are other areas that are struggling. It would be no surprise to anyone that those that are exposed heavily to say nickel or lithium are struggling now, whereas companies involved in iron ore or gold, commodities which are both enjoying stable prices, their fortunes are brighter. The water well and geotech sectors tend to be much more perennial and, we're hearing that there is much less volatility and conditions across those sectors. It could even be described as buoyant. Underground drilling seems to be holding up too, although there are reports that margins are being squeezed in that sector.

AMR: What are the current challenges facing the Australian drilling industry, and how will these be mitigated?

JM: A lot of drillers are exposed to commodity prices and the fortunes in mining, so for the drillers that have that exposure the biggest challenges they will face is having enough capacity when things are going really well. The tougher question they'll have during quieter times is what to do with idle equipment and of course, idle people, when conditions aren't there to support their drill rig fleets and their staff. Diversification is one way drilling companies deal with fluctuations in commodity prices. Larger companies make sure they are hedged against various mineral types and even repurposing their fleets into different drilling types.

The other key challenge is how do we keep the people we engage safe? How do drillers make sure that they have productive and profitable businesses at all

stages of the economic cycle? That will be an ongoing challenge, because the consequences for not keeping people safe can be severe.

AMR: How is training keeping up with innovation and evolving industry regulations?

JM: One of the things that keeps drilling businesses safe, productive and profitable is a commitment to making sure that all of our teams are well trained and well skilled for the tasks that they need to undertake. One of the challenges around training is how do we make sure it keeps up with safety demands. We have to step back and ask are we genuinely training people and equipping them to be safer and more productive in what they do and not just ticking boxes. It is not good enough for us to do something just because it has the appearance of being the right thing to do.

Training has to be responsive, and we have to be honest when ADIA offers training that it is actually going to help make businesses safer, more productive and more profitable. Are the training methods we're using driving the right level of engagement in the people who are being trained? Is it meeting their needs? Is it meeting the needs of the company? We have to step back and ask are we serving Gen Y and Gen Z who are entering the industry with old styles of training or should we be thinking about more online based training and learning that adapts to particular people's learning styles.

AMR: How is sustainability and the transition to renewables influencing mining projects across Australia, and what is the impact for drilling operators?

JM: Australia follows very rigorous and high standards for its mining operations and ESG obligations are taken very seriously. There are other markets in the world that perhaps don't mine to those levels of environmental safety and governance that are observed in Australia. One of the many reasons why some other markets can get their minerals to market cheaper is because they don't have the same standards that they adhere to, whereas Australia does.

One of the interesting challenges Australia faces is how does it become competitive on a global

stage where it has some of the highest standards for mining but at the same time the product has to be competitive in a world market. It's a balancing act because no one wants to see the environment degraded unnecessarily in the pursuit of finding renewables.

If there is no market for the commodities that we have in the ground because our cost structures are so high and our minerals are not competitive, then those minerals are going to stay in the ground. The issue is how do we find that right balance? How do we make sure that everybody globally adheres to the standard? They are really tough questions, and none of these issues are going to be easily resolved.

AMR: With continued technological advancements, including smart drilling, 3D modelling and automation, what do you see the future trends of drilling in the mining industry?

JM: The interesting thing about technology and the future trend in mining is that nothing stays still for long. Drillers are always trying to find a competitive advantage. They're always trying to find new ways to make sure that the metres drilled can be done safely, cost effectively and profitably, in other words, how can they drill more metres for the same inputs.

I don't think it'll ever get to that stage where there's not people involved; I think drilling is far too complex for that. But the idea that people are further away from the equipment, their control panel is further away from the operational part of the drill rig so should something go wrong they're out of harms way. The spirit of innovation is definitely alive and well in the drilling industry and if you couple it with 3D modelling, automation, and other technologies and it is inevitable that great things are going to continue happening.

For us to transform to a renewable green future, Australia and the world needs more drilling, not less. But what will that drilling look like? We hope it'll be far safer, far less of an impact on the environment, far more sustainable and profitable for the drillers because that will underpin our transition to the green future that we all look forward to. **AMR**



WA WATER BORES ARE THE EXPERTS



WA Water Bores is Western Australia's newest specialist in water well drilling based out of Geraldton, servicing the resources sector across the state and offering the very best in project management.

Utilising modern equipment and technology, WA Water Bores provides a quality assured process to deliver end-to-end solutions and all the reliability you would come to expect from a professional business.

With more than 15 years' experience in the industry and an intimate knowledge of various drilling applications, WA Water Bores founder James Harrington and his team of specialists have the expertise and knowledge to offer cutting edge drilling innovation to clients not only in WA but across the whole of Australia.

A TEAM OF EXPERTS

With WA Water Bores' commitment to undertaking significant drilling projects and providing a detailed consultation process prior to work commencing, James has put together the most experienced and skilled

team who are all fully dedicated to implementing the highest standard of performance.

The combination of full industry experience and a complete range of deep well drilling equipment means the team at WA Water Bores has a track record of being one of the best in the business. Each team member is skilled in water well drilling with quality workmanship practices, an accurate knowledge of geology and ground water development, and each is dependable and reliable in providing positive results every time, on time.

Completing a large number of projects across WA since its inception in July 2022, you will not find a better partner for your project – because no matter the size, scale or complexity of the job, the team at WA Water Bores will finish on time and within your set budget – with no compromise to quality of work.

SERVICES

Delivering unparalleled quality and service, WA Water Bores specialises in all aspects of water well drilling, including but

not limited to: Mud Rotary and Rotary Air Hammer Drilling, Complete Bore Field Installations, Water Exploration Drilling, Mine Site Water Supply and Dewatering, TSF Recovery Bores, Water Monitoring Bores, Piezo Installations, Breakthrough Holes for Underground Dewatering, TSF Geotechnical Holes and Water Injection Bores, plus so much more.

WA Water Bores are also experts in Angled Paste Holes, achievable with James' years of experience in producing outstanding results and taking the guesswork out of a challenging operation or project.

With all these services on offer, WA Water Bores' equipment is maintained to the highest standard. The company's fleet consists of 4 drill rigs and a large range of ancillary equipment to back up its operations.

There is also a custom built Air-Core system specifically designed for the exploration of Palaeochannel sands.

AN EFFICIENT SYSTEM

Thanks to WA Water Bores setting itself

up with a fully automated IMS system, the team can concentrate on getting your water well drilling project finished efficiently rather than having to focus on managing paperwork to get all drilling and reporting processes complete.

All safety and training systems are set up in a cloud-based software system with input data uploaded via smartphones or tablet devices, whilst documents, policies, management plans, procedures, reports and registers are held and integrated into the software system.

EXCELLENCE IN DELIVERY

WA Water Bores has developed its business to provide first class drilling solutions with a pursuit for excellence in its delivery.

Offering exceptional value in the water well drilling industry, James and his experienced field crew at WA Water Bores works with you and your requirements for purpose built drilling to ensure the completion of projects on time and on budget.

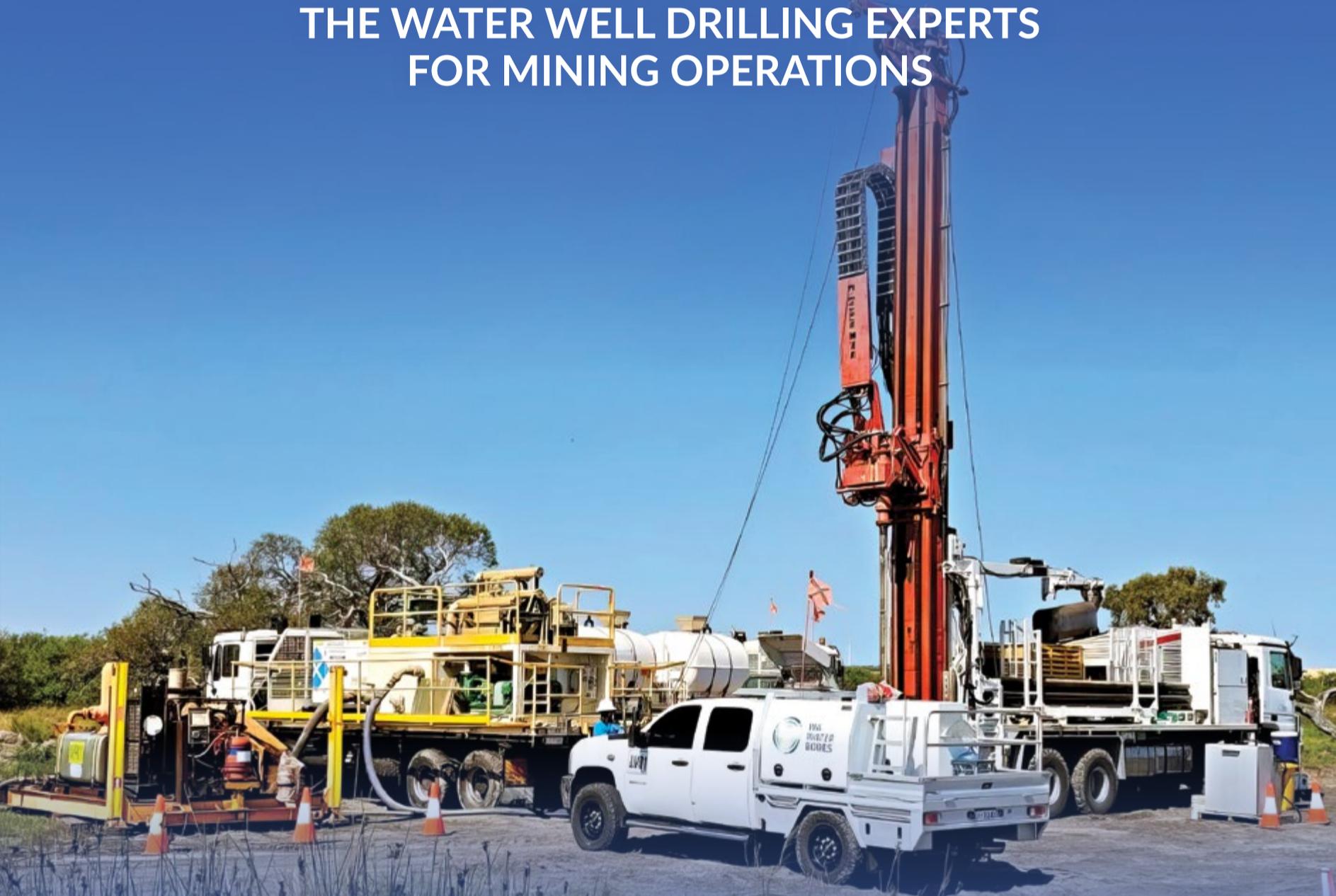
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DIAMOND DRILLING & RC SERVICES



Topdrive Drillers Australia provide contract Diamond Drilling and RC services to the mining and minerals industry in Australia.

Safety, core recovery, sample presentation and quality control are major priorities for us here at Topdrive Drillers, and we use only the very best equipment to achieve top quality samples and service.

We can undertake PQ, HQ, NQ and triple tube diamond drilling and we also offer services in mud rotary, reverse circulation and wedging or directional control to depths of 3,500m.

What Makes Us Different?

Our people are the key to our success.

Topdrive Drillers backs our teams with a tailored equipment suite, suited to your requirements and where the business owner actually runs the business so you can get decisions and advice directly

without delay unlike the much larger companies.

Topdrive Drillers' intimate team boasts over 125 years combined field and management experience, and today we provide contract RC and Diamond Drilling services to the mining and minerals industry all across the country. Experience ranges from the remote desert drilling operations to mine site geotechnical and directional resource drill outs.

What Services Do We Provide?

Our main priority is to ensure the best possible safe quality and cost-efficient outcomes for all our customers.

Boasting a complete set of support equipment and experienced backup, Topdrive Drillers ensures that all remote drilling sites are completely self-sufficient. Our extensive list of support equipment includes mobile workshops, support trucks and a fully-equipped site office/mobile

workshop are backed with experienced management and field staff.

Diamond Drilling: From small footprint shallow angle drilling rigs suited to tight access hilly terrain or environmentally sensitive areas to the larger deep holes with directional drilling requirements with wedging, (Navi) down the hole motor directional drilling, to the depths in excessive of 3,000m.

- NQ2, HQ, HQ3, PQ and PQ3 triple tube coring to depths of 3,500m
- Coring from surface and mud rotary
- Geotechnical coring in difficult ground conditions
- Directional controlled drilling options and experience second to none
- Multiple intersection holes
- Small foot print environmentally sensitive capabilities with Low impact drilling

Reverse Circulation Drilling: Deep reverse circulation capability is here,

adding to our fleet with the correct equipment to ensure we remain ahead of the game. We have all the safety features considered for this rig suite.

In recent times we have utilised our multipurpose rig for reverse circulation due to the high demand for RC drilling. To help our key clients, we have moved this rig to a full scale RC rig with drilling capabilities reaching 400m; this package is backed up with 2,400cfm @ 1,000psi and allows efficient drilling to reduce costs and improve sample quality when intercepting water at depth.

Our RC team has a combined experience of more than 50 years so this is no disadvantage to our clients as the level of experience within our team is consistent with the high quality drillers we have.

Topdrive Drillers are committed to providing a safe, environmentally conscious service to their valued clients, utilising our crews' skillsets and quality equipment. **AMR**



Diamond Drilling & RC Services

Specialising in core recovery, sample presentation & quality control

Topdrive Drillers Australia provide contract Diamond Drilling and RC services to the Mining and Minerals Industry in Australia.

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- ✓ Reverse Circulation ✓ Depths of up to 3,500m
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Solar powered Solutions by



Assent Engineering's hydraulic jack up bases are electrically operated and remote-controlled.

Assent Engineering, a leading provider of custom equipment for the mining industry, has developed a Hydraulic Jack Up Base that is 100% operated from solar power. This innovative design not only showcases Assent's ability to provide solar powered solutions to meet individual project needs, but also highlights their commitment to energy efficiency and environmental sustainability.

The Hydraulic Jack Up Base is electrically operated and remote controlled, with a solar-charged battery pack on board to drive the hydraulic motor. This feature not only reduces the environmental impact of traditional diesel engines, but also future proofs the machine in line with the growing demand for renewable energy solutions in the mining industry.

In addition to being energy efficient, the

remote control feature of the base creates a safer working environment as operators have greater visibility during loading and unloading. This minimises the chances of errors and accidents, providing peace of mind to users.

Furthermore, the Hydraulic Jack Up Base eliminates the need for working at heights, as all operating components including the oil tank, batteries, and the hydraulic pump are mounted at ground level. This allows for easy access to service points without the need to climb up on the back of a trucks.

With over 50 machines already built and distributed across Australia, Assent Engineering continues to work closely with clients to manufacture machines tailored to their specific requirements. Whether used for mounting drill rods, compres-

sors, water tanks, fuel tanks, or a combination of both, the Hydraulic Jack Up Base offers a versatile solution to the current shortage of suitable trucks in the mining industry.

For companies looking to optimise their fleet and increase efficiency, Assent also offers the option to hire Hydraulic Jack Up Bases for short or long-term contracts. With a team of highly qualified staff specialising in bespoke builds, Assent Engineering is dedicated to providing innovative solutions to meet the unique challenges faced by the mining industry.

Assent Engineering is a renowned provider of bespoke builds in the mining industry, with a strong focus on renewable energy solutions. Clients frequently turn to us with drill rig and handling challenges, knowing that we have the expertise to design and

manufacture customised equipment to effectively address their needs.

Our equipment portfolio emphasises automation and the hands-free operation of drilling equipment. From hydraulic breakout systems and drill mud cleaning systems to component storage and transport solutions, we are dedicated to enhancing efficiency and productivity in mining operations. Additionally, our services extend to general repairs and maintenance on drilling equipment, ensuring peak performance and longevity.

At Assent Engineering, our team comprises highly qualified professionals who are recognised experts in their respective fields. With a combination of draftsmen, mechanical fitters, boilermakers, and mechanical engineers, we bring a diverse skill set to every project. **AMR**



ASSENT ENGINEERING Pty Ltd

The Hydraulic Jack Up Base is 100% operated from solar power, showcasing **Assent Engineering's** commitment to energy efficiency and environmental sustainability.



Features

- ✓ Solar powered battery pack to power hydraulics
- ✓ Remote control, gives the operator better visibility
- ✓ All operation components mounted at ground level
- ✓ Jacks up to 1800mm high to fit under flatbed trucks
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BET ON BARTLETT AT EVERY DEPTH



Mineral exploration is tough work at the best of times, but drilling in remote and isolated areas of Australia comes with added challenges.

When Bartlett Resources Director Gerry Bartlett set out in the drilling industry over 30 years ago, he couldn't have imagined his company would grow into the drilling contractor it is today.

The Serpentine based exploration drilling contractor offers a specialised service in Air Core (AC) and slimline Reverse Circulation (RC) drilling for mining companies in diverse geological environments across the country.

Gerry and his team bring a wealth of knowledge in mineral exploration to every

drilling project, proving the magic formula in his success and the level of quality of service his customers have come to expect.

"We are a company committed to tackling exploration projects in extreme environments, which has made us leaders in our field," Mr Bartlett said.

"Delivering a first rate service and exceeding clients' expectations is a core focus for us, and extensive skillset and experience are simply a bonus."

As leaders in AC and slimline RC drilling, Bartlett Resources utilises a range of drilling techniques to achieve the best project outcomes in different environments. From Rotary Air Blast (RAB), mud rotary and

geotechnical SPT drilling, to exploratory earth probing and soil sampling, you can be assured Bartlett has the right methods to suit every application.

Mr Bartlett said the company has recently completed drill programs in the Goldfields, Kimberley and Pilbara regions.

"In order to perform at our peak, and meet the demands of projects in these locations, we run an extensive fleet of drill rigs, rotary splitters, drilling equipment and support vehicles ready to engage any project, anywhere," he said.

"We have undertaken extensive rebuilds of two AC drill rigs with safety and reliability being the forefront of our construction requirements.

"With a quality line-up of field service equipment, we can optimise machine availability, whilst maintaining a low impact on the environment."

Safety is clearly a top priority in any drilling environment. Bartlett approaches every contract with the highest safety standards, from their equipment and drilling personnel, to logistics management and safety compliance.

The company is capable of meeting the strictest project requirements, providing customised solutions and competitive rates to suit unique site needs.

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FIVE-YEAR MILESTONE FOR CARMICHAEL MINE

The Carmichael mine is a thermal coal mine in Queensland's North Galilee Basin, about 160km northwest of the town of Clermont.

Construction of the mine began in June 2019 after the Federal and Queensland governments granted final approvals.

This year in June marks five years since the beginning of construction on the Carmichael mine, with the first stage of development currently complete.

Bravus Mining and Resources chief operating officer Mick Crowe says the project has now railed 10mtpa of high-quality thermal coal for export to nations overseas as planned.

"We said at the outset of the Carmichael mine and rail project that we'd deliver more than 1,500 direct jobs during the construction and testing and commissioning period," he said.

"We well and truly exceeded that with more than 2,600 people employed at the peak of construction and more than \$2b paid to regional Queensland contractors and businesses.

About 88% of the contracts went to Queensland business.

"That investment in jobs and contracts has flowed on in production and today we have more than 750 people working at Carmichael at any one time, with another third of that number on their operations swing," Mr Crowe said.

"Importantly the bulk of these people live in a regional city or town named Townsville, or Rockhampton, or Clermont, or Charters Towers or Mackay, and that's something we're very proud of."

Carmichael is one of more than 100 coal mines in Australia, comparable in capacity to existing mines in NSW's Hunter Valley and Queensland's Bowen Basin.

At around 10mtpa, Carmichael produces just a fraction of both Australia's coal production and export which in FY21 equalled 363mt, of which 192mt were thermal product.

Data from the World Coal Association

shows 151GW of new coal-fired power is under construction in 16 countries and due to come online by 2026.

151GW is more than double all existing capacity in the Australian energy market.

"There's no question that Australian coal will play a role, alongside renewables, as part of the global energy mix that delivers reliable and affordable power with reduced emissions intensity," Mr Crowe said.

"Our advantage is we have all of our key Federal and State approvals in place, and we have the low-cost, high-quality reserves to be mining profitably through the price cycles for decades to come.

"We are already meeting the rising demand for thermal coal in our region with a product that not only has a lower emissions profile than coal supplied by international competitors, but one that is mined responsibly in a highly regulated environment with the right checks and balances in place.

"That's good news for those nations trying to lift their citizens out of energy poverty, and it's good news for regional Queensland and the thousands of people who want a job in mining or to supply to our industry."

Mr Crowe says the business' focus is on continuing to export coal to meet growing global demand for thermal coal for energy, particularly in India and Southeast Asia.

While the Carmichael mine currently produces 10mtpa of high-quality thermal coal, it has approvals in place for up to 60mtpa.

The open cut mine uses truck and shovel, with its coal handling and processing plant (CHPP) having a bypass circuit (crushing and screen 1,500tph) and wash plant (single module 1,250tph with dense medium cyclone, spirals and dry co-disposal technology).

Train loadout is 3,500tph with coal from the mine railed along the 200km narrow gauge Carmichael Rail Network (CRN) and Newlands Rail System for export via the North Queensland Export Terminal (NQXT), which is Australia's most northerly coal export port and about 25km north of Bowen.

The recent 10mt railed milestone covers the coal shipments sent during testing and commissioning of the mine's export infrastructure and those tonnes railed to the port for export during the first year of mining operations.

All of the coal was safely transported from the mine to the NQXT by the Bowen Rail Company, also a Bravus Australia company, established in 2020 and now employing more than 150 people in the local Bowen community to run, support, and maintain its locomotives and rollingstock.

Prestigious mining awards for leading environmental management and Indigenous engagement

Bravus Mining and Resources has been recognised in prestigious mining awards for its leading environmental management and Indigenous engagement programs at the Carmichael mine near Clermont in central Queensland.

The regional Queensland business has been named a finalist in both the Excellence in Environmental Management and Sustainability and the Indigenous and Community Engagement categories at the 2023 Australian Mining Prospect Awards.

The Prospect Awards are among the most respected national industry awards for Australia's mining and minerals processing sector.

Bravus Mining and Resources head of community, communications and ESG Kate Campbell says the nominations acknowledged the company's significant investments in responsible mining practices.

"The Carmichael mine has some of the strictest environmental conditions of any resources project in Australia's history," she said.

"That means we also have some of the best environmental monitoring and scientific research programs in the world, especially in the areas of groundwater and species management.

"Being a finalist in these awards is due recognition of the outstanding work our talented environmental teams and their research and Traditional Owner partners

do at Carmichael to ensure we continue to operate in a way that is responsible, sustainable, and protects the environment and our neighbours."

The Excellence in Environmental Management and Sustainability nomination is for innovative AI-supported monitoring of the endangered Black-throated Finch.

Bravus Mining and Resources developed a targeted Management Plan to protect local Black-throated Finches and their habitat and researchers built an automated call recogniser to help track bird movements and to identify individual bird's home ranges, providing insights into their day-to-day behaviour.

The automated call recogniser has proved a more accurate method to detect the finches than visual surveys and the findings have been published in scientific journals to improve surveillance of other rare birds around the world.

The Indigenous and Community Engagement nomination is for collaboration between Bravus Mining and Resources and Wangan and Jagalingou Traditional Owner business, Woongal Environmental Services, for ecological management of the 33,000ha conservation area that surrounds the Carmichael mine.

Bravus Mining and Resources' Indigenous Participation Plan has a \$250m First Nations contracting and business development commitment.

Woongal was initially engaged for monitoring and surveying across the mining lease and in the Doongmabulla Springs Complex area but has since expanded its services at the Carmichael mine to include fauna spotting and catching, erosion and sedimentation control, weed and pest management, fencing, research into groundwater-dependent ecosystems, and road and track maintenance.

A dozen people have been employed by Woongal Environmental Services the service the contracts the business has received from Bravus Mining and Resources.

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PETRO INDUSTRIAL CUTTING-EDGE FUEL FARMS & LUBRICATION SOLUTIONS



Aerial view of fuel farm.

Amidst the dynamic realm of industrial technology, PETRO Industrial emerges as a beacon of innovation, reshaping the Carmichael Mine with cutting-edge tailored fuel and lubrication solutions. Central to this ground-breaking initiative is PETRO Industrial's revolutionary multiple fuel farms and lubrication storage system, tailored specifically for the Bravus Mine Group.

PETRO Industrial faced the formidable task of establishing three 1.2million litre fuel farms and one bulk Lubrication Station that manages both fresh and used oil storage for a fleet of heavy and light mining vehicles, all within the challenging confines of an extremely remote location.

Undeterred, PETRO Industrial leveraged its expertise, resources, and visionary approach to not only conceptualise but also engineer, fabricate, install, and commission in Northern Queensland, a project of unprecedented scale and complexity.

The cornerstone of PETRO Industrial's customised solution was the establishment of three strategically positioned modular fuel farms across the mining lease.

Each farm boasted a line-up of 12 interconnected diesel tanks, with a colossal capacity of 110,000 litres per tank. To ensure seamless refueling operations,

PETRO designed two stations for heavy vehicles and one for lighter vehicles, all feeding from a centralised filling point.

In alignment with PETRO Industrial's steadfast dedication to environmental stewardship, spill containment units have been strategically incorporated into every refueling station, ensuring adherence to eco-friendly practices and regulatory stan-

dards. PETRO Industrial takes immense pride in crafting solutions that not only withstand the rigors of nature but also endure the test of time. Additionally, we included solar-powered control modules to each fuel farm, housing all the switchboards, electronics, and the management interface for the pumps and dispensing.

Dispensing module high flow refuelling point.



To streamline operational flow at the Carmichael Mine and enhance oversight of fuel consumption, PETRO Industrial has introduced the groundbreaking iPETRO Fuel Management System. This innovative solution enables real-time monitoring, tracking and documentation of all dispensing points, significantly enhancing the efficiency and accuracy in fuel management. PETRO Industrial's innovative approach to lubrication storage and dispensing is epitomised by the deployment of a Multi-Compartment Lubrication Tank. This solution offers convenient refilling points while feeding into a dispensing module that provides access to eight distinct lubrication points within a single unit, enhancing efficiency and simplifying maintenance operations.

As a hallmark of quality and innovation, PETRO Industrial's solution for the Bravus Carmichael Mine showcases excellence in the mining sector. With meticulous planning, expert execution, and a commitment to sustainability, PETRO has revolutionised operations and set a new standard in industrial fuel and lubrication solutions.

Positioned at the forefront of the evolving mining industry, PETRO Industrial continues to drive change and set benchmarks.

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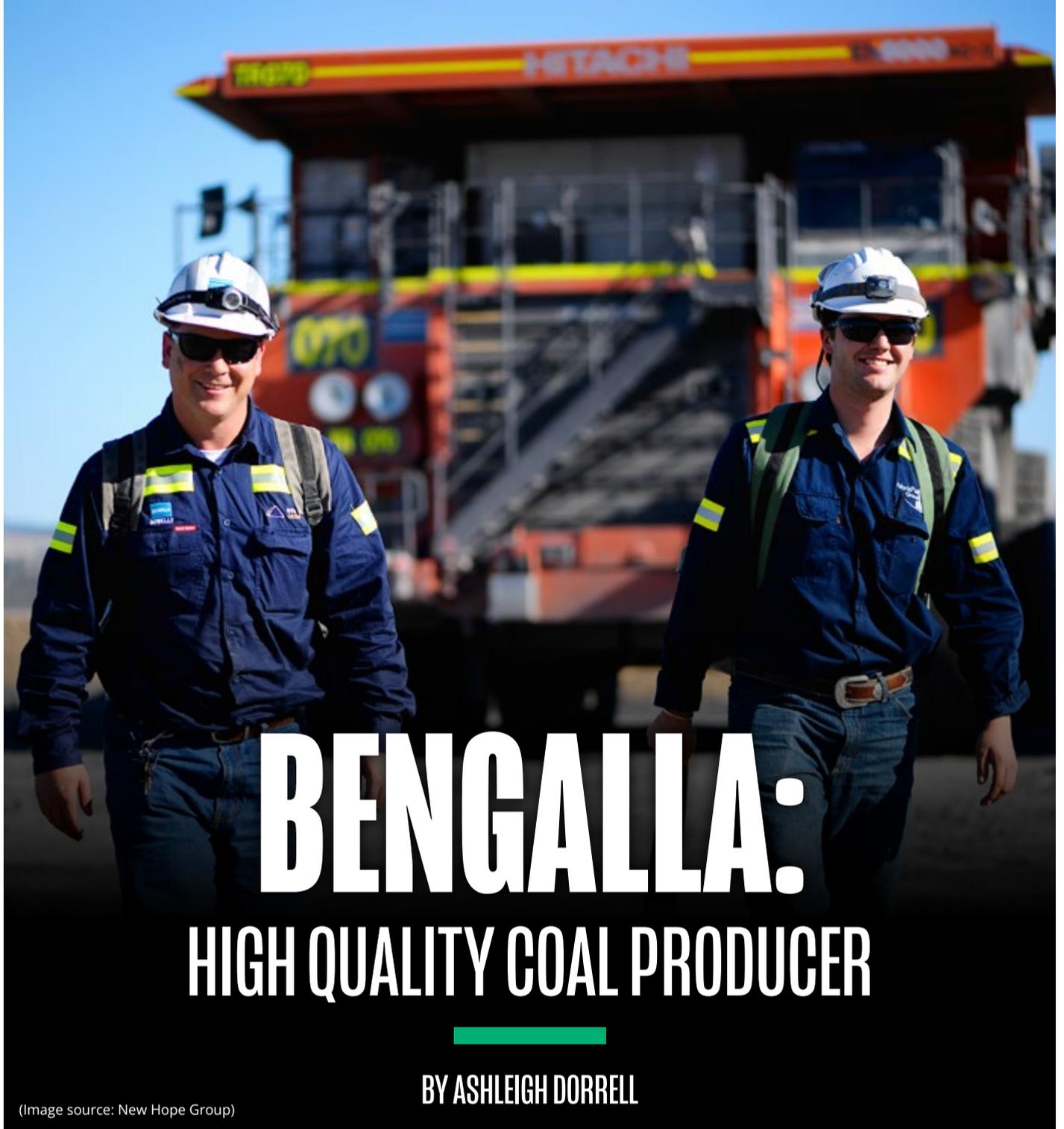
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BENGALLA: HIGH QUALITY COAL PRODUCER

BY ASHLEIGH DORRELL

(Image source: New Hope Group)

Located around 4km southwest of Muswellbrook in the Hunter Valley region of NSW, the Bengalla coal mine plays a significant role in supplying thermal coal to domestic and international markets.

The mine is operated by the Bengalla Mining Company (BMC), which is a joint venture between New Hope Group (80%) and Taipower (20%).

Operations

Bengalla is a single pit open cut, multi-seam mine with product extracted using dragline, truck and excavator methods, with employees working in shifts to keep the mine operating 24hrs a day, seven days a week. In 1996, Bengalla received an initial 21-year development consent which was renewed in March 2015 and extended mining through to 2039.

Once the coal is extracted, it is processed at the Bengalla Coal Handling Preparation Plant to produce a range of thermal coal products to meet customer specifications. Bengalla's coal products are predominantly gCNEWC benchmark.

Coal products destined for export are loaded onto trains and transported to the Port of Newcastle for shipment. Domestic coal is transported to energy generator customers via rail.

Due to periods of disruptive weather in the second half of 2022 and the first half of 2023, production of saleable coal at Bengalla in FY23 totalled 9mt, down 3% compared to FY22. During the year, a third haulage corridor, expected to improve mine haulage productivity by 7.5%, was constructed.

As Bengalla emits over 100kt of scope one emissions per year, the mine is subject to the Safeguard Mechanism under the *National Greenhouse and Energy Reporting Act 2007* which requires emissions from operations to be kept below applicable baseline limits.

Bengalla's greenhouse gas emissions have been below the baseline limit for each year it has been covered by this mechanism. In FY22, Bengalla's scope one emissions were 725,774t CO₂-e (carbon-dioxide equivalent).

As there is no tailings dam at Bengalla, the fine reject material is treated, dewatered, and placed in reject cells within the overburden emplacement area in a controlled manner.

Since 2005, 308ha of land has been rehabilitated at Bengalla with efforts focusing on restoring the land to a combination of pastoral grassland and high-density woody vegetate land.

Bengalla Growth Project

Beginning in 2022, the \$200m Bengalla growth project will see an increase in production capacity as well as an uplift in the quality of product. The main production objectives are scheduled to be achieved by mid-2024.

The expansion is divided into three parts — mining, coal handling preparation plant (CHPP) and infrastructure.

Mining

In the mining expansion, a further 18 machines, which includes six new Hitachi EH5000 trucks and a Liebherr R9800 excavator, will be purchased. Additional

equipment such as a Cat MD6250 drill, a couple of dozers, a grader and a watercart will be delivered by mid-2024. This equipment will enable Bengalla to increase delivery of run-of-mine (ROM) coal from 12.5mtpa to 13.4mtpa.

Coal Handling Preparation Plant

To deal with the extra ROM tonnes, the CHPP is getting an upgrade to increase throughput and product quality.

The spirals and tailings circuit will be upgraded, resulting in plant input increasing from 11mtpa to 12.9mtpa. This upgrade will deliver an improved average quality of products to align with the market demand for high-quality coal.

A new processing building is being constructed on the northern end of the plant which will house a further four belt press filters.

In the future, upgrades to the raw coal reclaim circuit will be introduced to keep up with the upgraded plant.

Infrastructure

The increase in output requires more people onsite for the construction and continuing operations, as well as a reconfiguration of the infrastructure area as the pit shell progresses through the existing facilities.

To cope with the staff increase and pit progression, further carpark spaces, administration and bathroom buildings, plus maintenance and warehousing facilities will be built. **AMR**

LEADERSHIP & PERFORMANCE PARTNERS

PROVIDING ITS SERVICES TO BENGALLA



With over 50 years of combined experience working with businesses from a variety of industries across Australia, Leadership & Performance Partners designs, develops and delivers professional development programs to increase the competence and confidence of people from all levels of an organisation.

Leadership & Performance Partners works with businesses, individuals and teams to achieve positive, long-term behavioural change to become more effective and efficient in the workplace. Rather than a 'one-size-fits-all' approach, Leadership & Performance Partners tailor professional development solutions for clients to meet their outcomes and goals.

The company uses accredited psychomet-

ric tools to support its programs including DISC, MLQ, HBDI Myer Briggs Type Indicator, LSI1 and LSI2, and 360 Feedback. Coaching support may also be provided by Leadership & Performance Partners to assist individuals and businesses to achieve their goals.

Working with Bengalla

Since 2019, Leadership & Performance Partners have been working with Bengalla to provide professional development programs and workplace coaching with programs such as:

Bengalla Talent Identification Program

- Every year since 2021, Bengalla has identified leaders within their business, including step-ups, supervisors, managers and superintendents who have the

potential to develop and move into higher positions. This program involves a 360 feedback, DISC assessment, one on one coaching sessions and face-to-face workshops.

Bengalla On-Boarding Program

- As a result of rapid recruitment at Bengalla, Leadership & Performance Partners assisted in the development and delivery of onboarding sessions for new employees.

Team Focused Workshops

- These workshops focused on areas such as emotional intelligence, influencing skills and dealing with difficult people. The workshops are developed at the request of individual departments to meet their specific needs.

On-Site Coaching Support

- Provided in 2023 to OCE's, Leadership & Performance Partners spent time in the field with these leaders to provide timely feedback and suggestions on improving their leadership capabilities.

Other programs include professional development sessions delivered at Bengalla U Days and the provision of DISC reports and de-briefs to personnel from Bengalla.

This work has seen Leadership & Performance Partners develop a strong relationship with Bengalla management and personnel, with improvements in leadership capabilities observed across the business. **AMR**



Leadership & Performance Partners

Developing programs suited to your needs, people and business environment.



Leadership & Performance Partners is committed to working with businesses and individuals to develop programs that are suited to specific needs.

Working with you, your organisation, team and stakeholders to gain an understanding of professional development requirements and desired outcomes to tailor a program that will deliver the best results.

Training and programs include:

- ✓ Crucial Conversations
- ✓ Negotiation Skills
- ✓ Situational Awareness
- ✓ Critical Thinking and Decision Making
- ✓ Dealing with Conflict
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FOSTERVILLE:

VICTORIA'S GOLDEN EAGLE

BY ASHLEIGH DORRELL

(Image source: Agnico Eagle) Scott Perdon, Senior Technician.

With 2023 production totalling 277,694oz, Agnico Eagle Mines' Fosterville mine in Victoria is the largest gold producer in the state.

Previously owned by Kirkland Lake Gold, Agnico acquired Fosterville in February 2022 following the completion of the merger between the two companies.

Spanning an area of 1400km², Fosterville hosts numerous brownfield and greenfield exploration targets. Exploration programs to date have traced only 20km of potential gold-bearing structures, highlighting untapped exploration potential.

Notably, the presence of visible gold becomes increasingly significant at depth and is observed more frequently below a depth of 800m within the Lower Phoenix and Harrier gold systems.

History of Operations

Gold was first discovered at Fosterville in 1894 with operations continuing until 1903 where the mine lay dormant until 1988. Between 1988 and 2001, 240oz of gold was poured from heap leaching ore derived from shallow oxide open pits.

In 2015, the Eagle Zone was discovered after high-grade visible gold mineralisation was intersected at depth, and a year later in 2016, the ultra-high-grade Swan Zone was discovered. The discovery of the Swan Zone transformed Fosterville into one of the world's richest gold mines.

The discovery of these zones significantly improved the overall mineral reserve grade and production profile with exploration work in 2016 finding similar visible gold mineralisation in the Harrier Zone.

In 2021, an \$80.5m exploration program was undertaken, including the development of a twin exploration drive from the Fosterville mine to Robbins Hill. This work interested high-grade quartz with visible gold 500m down-plunge from the Swan Zone.

Current Operations

Current mining activities are focused on the Central, Phoenix and Harrier underground ore zones with underground mining undertaken using a conventional fleet including jumbos, production drills, loaders, trucks and ancillary equipment.

In 2023, 84,310m of exploration drilling, across 309 holes, was undertaken, comprising of 68,687m of underground drilling and 15,623m of surface drilling.

This drilling encountered high grade gold and demonstrated the potential for several zones at Phoenix and Robbins Hill to provide additional mineral resources and mineral reserves. Up to 301.4g/t gold was intersected at Robbins Hill, while up to 120g/t gold was intersected at Phoenix.

Once received, ore is processed at the Fosterville mill which has the capacity of 2275t per day. First, the ore is crushed



(Image source: Agnico Eagle) Ariel view of Fosterville gold mine operations.

and grinded then followed by flotation, bacterial oxidation and carbon-in-leach circuits.

Production began in April 2005 with the one millionth ounce of gold produced in December 2015. In March 2023, Fosterville produced its four millionth ounce of gold.

Future Work

Throughout 2024, Agnico expects to carry out 38,700m of drilling with a focus on the extensions of the mineral reserves and mineral resources at Lower Phoenix and Robbins Hill. A further 36,500m of underground and surface exploration drilling has been planned to test new geological targets.

Additionally, preparation is underway for surface exploration programs to identify favourable structural environments with folding and faulting similar to the fault that hosts the Swan Zone. Drilling will then be undertaken on any new prospective targets.

Based on current and historical exploration as well as the results received to date, Agnico Eagle's long-term goal

for Fosterville is to establish the mine as a long-line asset through the successful replacement of mineral reserves.

With a mine life up until 2031, the company believes the potential exists to discover further high-grade zones that could potentially support high production levels.

Fosterville Community Grants Program

2024 marks the 19th anniversary of the Fosterville community grants program with 258 community groups awarded a total of \$500,000 since then.

Grants of up to \$5000 are available to eligible applicants to support a wide range of community group or activities that benefit the communities surrounding the Fosterville mine.

This grants program aims to support the projects that provide specific sustainable outcomes which have long lasting benefits to the wider community.

Previous recipients include the Junortoun Fire Brigade, Eaglehawk North Primary School, Heathcote SES and the Ironbark Tennis Club. **AMR**



(Image source: Agnico Eagle) Ariel view of the Ellesmere Pit and rehabilitated McCormick Waste Rock Dump.



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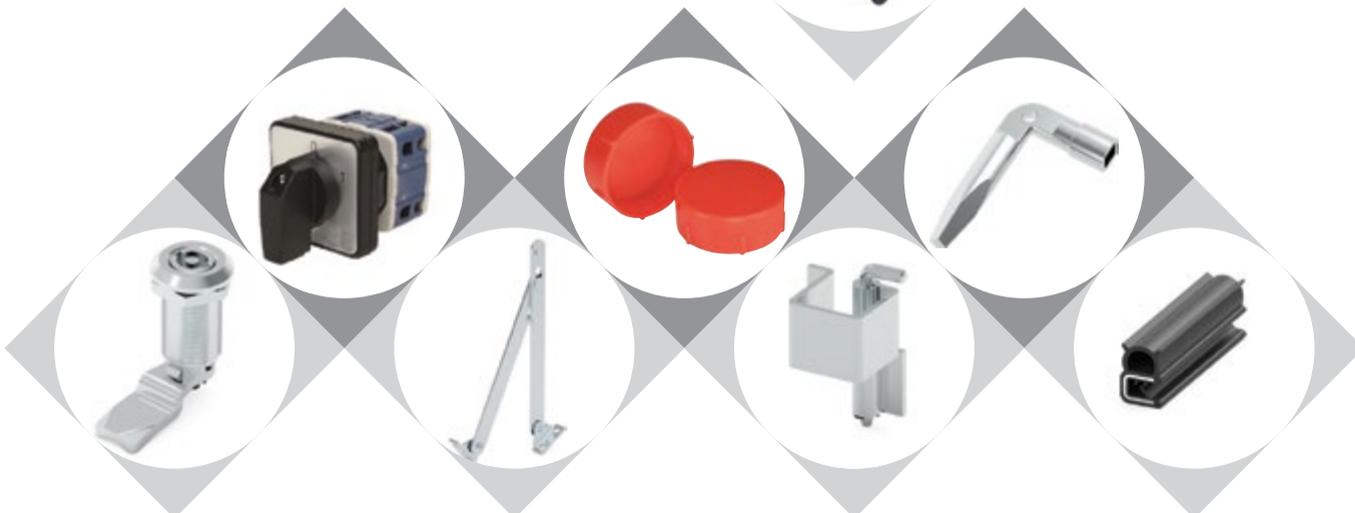
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GRUYERE:

ONE OF AUSTRALIA'S MOST SIGNIFICANT UNDEVELOPED GOLD DEPOSITS

BY KATE DZIENIS

Tier 1 gold production and exploration company Gold Road Resources (ASX: GOR) produced 64,323oz of gold from its Gruyere gold mine in the March quarter, despite significant rain occurrences.

Located in the Yamarna Greenstone Belt in WA's north-eastern Goldfields, Gruyere is held in a 50:50 joint venture with Gold Fields. It currently has a mine life in excess of 10 years and is claimed to be one of the most significant undeveloped gold deposits in Australia.

First gold was delivered in the second quarter of 2019 and since that milestone the Gruyere joint venture has successfully yielded 918,479oz of gold up until December 31, 2022. The Gruyere JV also hosts open pit mineral resources of 6.69moz and ore reserves of 4.05moz.

Weather Impact

Throughout March and early April 2024, production at Gruyere was impacted by sustained rainfall and extended road closures. The mine was hit with more than 50% of average annual rainfall for the region in the first two weeks of March, with more than 140mm just this month alone. This weather resulted in road closures in the Laverton and adjacent shires – in particular Great Central Road, the main supply route to Gruyere, which had been shut since March 5, 2024 due to areas of extensive flood damage.

Mining and processing operations have resumed at Gruyere, with consumables transported via the Northern Territory and Warburton to the east of Gruyere while repairs continue on the Great Central Road.

This saw reduced mining, however, the processing of low-grade stockpiles has continued through most of the rain impacted period but plant operations were suspended from March 28, 2024, with a scheduled plant shut down for maintenance brought forward to minimise the impact on annual gold production.

Mining

Gruyere's mining contractor was successful in the recruitment of labour to support the ongoing expansion of mining rates at the gold mine, with the workforce achieving desired numbers in February with total material movement rates ramped up to the targeted annualised daily rates in late February and early March, prior to rain.

Production

Gruyere produced 64,323oz of gold at an all-in sustaining cost (AISC) of \$2194 per attributable ounce during the March 2024 quarter. In the December quarter,

74,659oz was produced at an AISC of \$1973 per attributable ounce.

Following the rain event, 2024 annual guidance for Gruyere is anticipated to be in the lower half of guidance of between 300,000oz and 335,000oz and the upper half of attributable AISC of between \$1900 and \$2050 per ounce.

Gold Road has cautioned though that the impacts of the rain will result in lower than previously anticipated production in the June quarter.

The company reported that mining rates were at desired levels during February and early March, prior to rain impacts, and that production remains guided to continue ramping up throughout the calendar year with stronger production performance expected in the second half of the year.

Additionally, Gold Road has said it began

drilling to test further mining opportunities beneath the Gruyere ore reserve.

Financial & Corporate

As of March 31, 2024, the company held cash and equivalents of \$146.2m with no debt drawn.

Gold Road reported that its gold sales totalled 32,325oz at an average sales price of \$3137oz for a sales revenue of \$101.4m. The company had 1825oz of gold doré and bullion on hand as of March 31.

The company's attributable operating cash flow from Gruyere for the quarter amounted to \$57.9m, with free cash flow standing at \$5.5m. The company's corporate all-in cost, which includes growth capital and corporate and exploration costs, was reported at \$2638oz for the March quarter.

Gold Road disclosed that its cash and equivalents amounted to about \$146.2m, with no debt drawn.

Exploration

Gold Road's exploration strategy remains focused on discovering economic gold deposits that can be developed as standalone mining operations, creating shareholder value through organic growth.

The rainfall had significantly impacted on Gold Road's exploration efforts during the quarter, leading to delays or suspended programs at Gruyere, Yamarna (including Gilmour) and Mallina but it noted some encouraging reverse circulation drill intersections were returned from immediately north of the Gilmour resource at Yamarna and included 4m at 7.37g/t gold. **AMR**



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FORGING AHEAD: NEW ACLAND STAGE 3

BY ASHLEIGH DORRELL



(Image source: New Hope Group) New Acland Mine.

Containing more than 500mt of coal, the New Acland Coal Mine is located 35km northwest of Toowoomba in Queensland. It is operated by New Acland Coal (NAC), a subsidiary of New Hope Group.

New Hope Group purchased the mine in 1999 and for the past 25 years the mine has economically contributed to the Darling Downs region.

Operations at New Acland began in 2002 with the mine officially opening in March 2003 by then Queensland Premier Peter Beattie. It expanded to stage two in 2005 and by 2012 the mine produced 5.09mtpa of thermal coal.

New Acland Stage Three

For the past 17 years, New Hope has been advocating and fighting for the progression of stage three work and in October 2022, the Queensland Government approved New Acland Stage 3.

The stage three project expands the existing New Acland coal mine to produce up to 5mtpa of coal over a mine life of 12

years and involves the development of three new pits within the Manning Vale and Willeroo resource areas.

Working in partnership with local contractors and suppliers – where possible – New Acland Coal will build a materials handling facility, train load out facility, rail lines, roads, dams and bridges. Teams will also be needed to supervise demolition and rehabilitation projects on site.

Since its approval, New Acland Mine Stage 3 has progressed rapidly with the workforce growing from 20 employees to more than 150 in the past 18 months.

“Stage 3 is constantly evolving, with our people currently prioritising coal extraction from Manning Vale East Pit,” New Acland mine general manager Dave O’Dwyer said.

Work is also underway on the 13.5km Lagoon Creek Conservation Zone which will see more than 3000 trees planted over the next 10 years.

Running through the New Acland Mine,

the Lagoon Creek Conservation Zone will see the vegetation corridor along Lagoon Creek widened to more than 100m, enhancing animal and plant biodiversity.

Lagoon Creek will complement rehabilitation outcomes from previously mined areas and strengthen New Hope’s commitment to environmental sustainability and progressive rehabilitation practices.

“In total, more than 135ha of land alongside Lagoon Creek will be prioritised and planted with native vegetation, including eucalyptus, paper bark and other refuge trees, designed to significantly boost the local koala population,” Mr O’Dwyer said.

“New Acland Mine is home to one of Australia’s most ambitious and practical land management programs. Established more than 17 years ago, the progressive rehabilitation program returns mined land to agricultural and conservation uses while contributing to the region’s agribusiness industry.

“To date, more than 740ha of land has been rehabilitated. Of this, 349ha has been formally approved as progressively rehabilitated mined land by the Queensland Government.”

First Coal

Sixteen years in the making, first coal from New Acland Stage 3 was achieved in September 2023 with this marking an important milestone for the company.

“It was a breakthrough moment for the entire team, including our people and the



(Image source: New Hope Group) New Acland mine general manager Dave O’Dwyer.

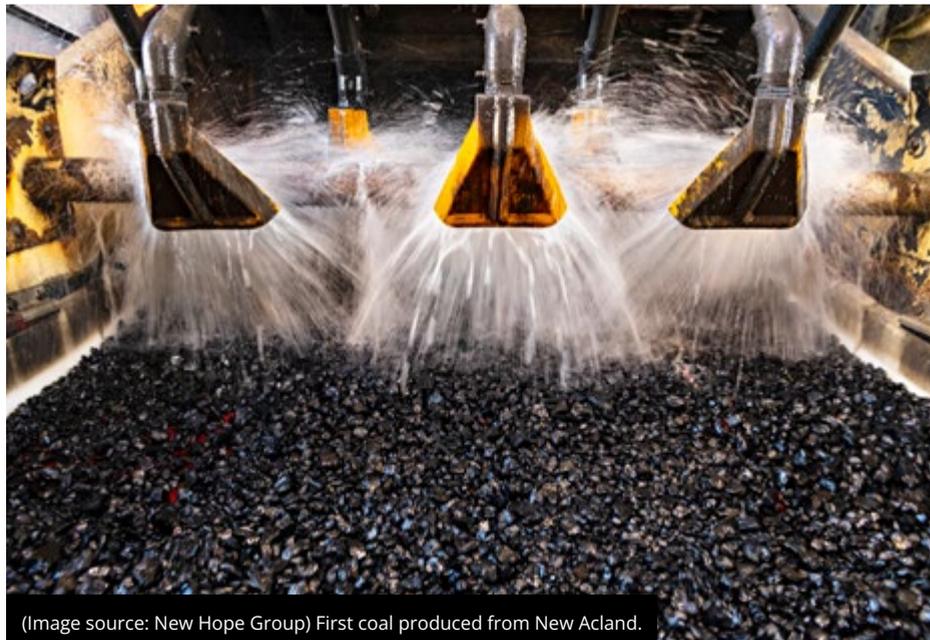
local community, who stood beside New Hope Group as we secured the necessary approvals for stage three from the Queensland Government,” Mr O’Dwyer said.

“Achieving first coal was a surreal moment and triggered a significant ramp-up on site and a wave of additional milestones, including more job opportunities, first washed coal via the onsite coal handling and processing plant and the first shipment of coal from New Acland Mine to the Port of Brisbane in more than two years.”

Future Operations

New Acland Mine Stage 3 will progress from the Manning Vale East pit to the Willeroo pit, then the Manning Vale West pit, however, the mining footprint will remain relatively small due to New Hope’s rehabilitation program.

As production increases from stage three, New Hope’s workforce will more than double in size to 400 full time roles over the next two years. **AMR**



(Image source: New Hope Group) First coal produced from New Acland.

CRITICAL INPUT

CHARTS NEW HORIZONS IN SUPPLY CHAIN MANAGEMENT



Pivotal years managing supply operations for a remote mine in Papua New Guinea not only shaped Tim Griffiths' expertise but also ignited the spark that would lead to the founding of Critical Input.

Managing Director Tim Griffiths, who acquired a degree in Bachelor of Business in Supply Chain before 'supply chain' had entered the vernacular, said these were transformative years that forced him to innovate against a backdrop of extreme conditions.

"Managing a supply operation that was the lifeline of an entire community was profound," Tim explained.

"It brought to life the critical importance of every link in the supply chain - thus the inspiration behind the name 'Critical Input'.

"It instilled in me the drive to deliver solutions that not only meet but also anticipate the needs of clients, no matter how challenging the environment."

The Evolution Of Critical Input

This year, Critical Input quietly

celebrated 17 years of steady growth and sustainability.

"Critical Input has evolved from a single-person operation to achieving this significant milestone," Tim said.

"Proudly 100 per cent Australian and 50 per cent Indigenous Australian owned and operated, we break barriers and challenge the norms of larger consultancy firms by placing a sustainability focus at the heart of our improvement works.

"All our consultants are senior in their experience and specialists in their field.

"We also have a gender pay gap that defies industry standards with women earning 7 per cent more at our firm."

The Trifecta Of Values

Critical Input's success is firmly rooted in its commitment to three foundational values: process, people, and principles.

"It's a trifecta that guides us towards operational excellence - without process, there is no destination; without people, there is no evolution; and without principles, there is no integrity," Tim said.

A Holistic Approach

With a respected name in the business process optimisation landscape, Critical Input is pioneering innovative pathways for supply chain management and project efficiency.

"At Critical Input, we don't just address immediate challenges - we design and executive strategies that foster long-term resilience and efficiency," Tim said.

"Our approach centres on understanding the issue at its core, ensuring that we're not just applying a band-aid but curing the ailment."

Forward-Thinking And Social Responsibility

Looking ahead, Tim noted the shifting tides in supply chain management towards sustainable and socially responsible practices.

"We're moving towards a holistic understanding of supply chains that factor in environmental and social responsibilities alongside operational efficiency," Tim said.

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MOUNT GIBSON IRON

CAPITALISING ON KOOLAN ISLAND

BY KANE DIVE



Dump trucks parked between shifts at Koolan Island, March 2023.

In 2023, Mount Gibson Iron's (ASX:MGX) flagship Koolan Island operation celebrated its 40th anniversary. Located in the Buccaneer Archipelago 140km north of Derby, and renowned as the birthplace of WA's iron ore industry, Koolan Island is a major producer of high-grade hematite ore.

Mount Gibson chief executive Peter Kerr says the last 12 months has been very positive for Koolan Island with strong results reported in the first half of FY24.

"We generated significant cashflow from increased high-grade iron ore sales flowing from our prior completion of the two-year waste stripping program in the Main Pit, as well as the restoration of the processing plant to full capacity," he said.

"We capitalised on the substantial ore stockpiles previously built during processing plant repairs and delivered increased ore sales into a strong iron ore market.

"This enabled us to deliver record six-monthly sales of 2.5mwt of high-grade (+65% Fe) iron ore and helped us to add almost \$200m to our cash reserves over the period.

"Those ore stockpiles have now been monetised, so operations are back to a more normal footing with shipments aligned to ore production."

Mr Kerr says that "Koolan presents unique operational challenges given its location, seasonal weather impacts, and complex geotechnical requirements".

"However, we are well positioned to achieve our FY24 sales guidance of 3.8-4.2mwt, and to generate healthy cashflow over the mine's remaining three years, obviously subject to iron ore prices," he said.

Koolan Island's Resurgence

Since the reconstruction of the seawall was completed back in 2018, Koolan Island continues to perform in line with expectations.

Mount Gibson achieved solid ore sales of over 0.7mwt in the March quarter. This was despite experiencing weather interruptions as part of Northern Australia's wet season, and a ship-loading interruption in late March, which delayed a couple of shipments up until April.

The first nine months of the year saw sales total 3.2mwt, and as a result, at the end of March, the company's cash and investment reserves balance totalled \$430m (excluding its holding in Fenix Resources), an increase of \$72m over the quarter.

"We are continually seeking and actively assessing a range of potential opportunities, primarily in base metals and bulk commodities in Australia," said Mr Kerr.

"The western end of Main Pit is nearing its planned final depth.

"Production from that specific area is scheduled to conclude around the mid-2024.

"We will then switch the haul ramp back to focus on production in the eastern half of the pit.

"The western end will largely serve as a capture point for dewatering, allowing

us to manage normal groundwater flow while we mine the eastern half of the pit."

Community Engagement

As a company that's been in production since 2004, Mount Gibson has always placed great importance on establishing close cooperative relationships with its local communities, Traditional Owners and local contractors.

"We have always been a significant employer and user of local skills, services and suppliers, for our operations in both the Mid-West region and at Koolan Island in the Kimberley," said Mr Kerr.

The company has a highly-valued longstanding relationship with the Dambimangari People, the Traditional Owners of Koolan Island. Both parties work closely in the areas of employment, training, environmental management, as well as the assessment of potential future commercial opportunities for Koolan Island once mining is complete.

Mr Kerr highlighted that Indigenous Australians represent over 16% of the Koolan team, with approximately 17% of its workforce living in the surrounding Kimberley region.

"Mount Gibson also makes a substantial

contribution to the broader community relative to our modest size," he said.

"In the last financial year, the company's total economic contribution to Australia came in just under \$380m, which includes all payments to Australian suppliers and contractors, our employee wages, government taxes, royalties and community contributions."

Exploration on the horizon

From an exploration perspective, Mount Gibson have been testing the potential for base metals on tenements near and north of the old Tallering Peak mine in the Mid-West. The company also continues to assess a number of farm-in opportunities in WA primarily targeting base metals.

"At Koolan Island, we are focused on how we can convert more of our known resources to reserves," said Mr Kerr.

"Depending on iron ore prices, there may be some scope to extract a little more out of the Main Pit, and potentially blend medium-grade material from satellite deposits.

"Outside our continued focus on base metals, we also have an existing portfolio of minor investments in a number of junior resources companies with projects we believe offer future potential."

In terms of innovation in materials and equipment, Mount Gibson recently adopted customised blast hole casing designs, which extend blasthole depths in friable and wet high-grade ores for improved blasting productivity.

"We are also assessing potential renewable power and carbon reduction enhancements to some of our on-site power generation equipment," said Mr Kerr.

"Technological advances in emission intensity and carbon reduction, are an important consideration for the new resources development opportunities being explored." **AMR**



High grade ore mining in the upper east end of Main Pit at Koolan Island, February 2024

TOUGH AS THE ELEMENTS®: DOMESHELTER™ FABRIC STRUCTURES FOR PORTABLE BUILDING SOLUTIONS



With temperatures reaching 50°C and severe winds of nearly 300km/h, Australia is a harsh environment with people and assets needing to be protected, particularly in the country's mining and resource operations.

Built to withstand the country's harsh climate, DomeShelter™ Fabric Structures are designed, engineered and manufactured in Australia to International standards – ISO 9001 and ISO 45001 and delivered to the remotest sites worldwide for easy installation.

One such remote location is Koolan Island off WA's coast, with Koolan Iron Ore requiring another Workshop area to house large dump trucks and other mining equipment.

Already tried and tested to the harsh conditions of the area — which gets wind

gusts up to 290km/h and salty spray from the nearby water — a DomeShelter™ Structure was the obvious choice.

Koolan Iron Ore wanted to facilitate quick and efficient servicing to minimise downtime, while providing a safe and cool environment protected from the elements where staff could perform their duties.

Balancing operational and production targets whilst also keeping a safe worksite has a considerable influence on mine site infrastructure requirements.

Effective project management requires infrastructure solutions that comply with the strict engineering and quality standards while remaining on budget. These solutions should minimise maintenance requirements, reduce environmental footprint and be suitable for transportation and installation in extremely remote locations.

DomeShelter™ Structures can be customised to suit a wide range of Industries — from Mining, Defence, Aerospace, Construction, Agriculture and Transport — with a range of add-ons available.

Add-ons include lighting, gutter systems, internal walls, tropical roofs, endwalls and doors, and they offer significant benefits over steel sheds, using substantially less materials and typically not needing lengthy planning and approvals processes.

Additionally, DomeShelter Australia offer a maintenance program that can be carried out where a DomeShelter™ Project Manager visits the site annually to conduct inspections and provide detailed reports on the Shelters' condition. Clients can easily arrange these maintenance visits by contacting a DomeShelter™ Representative.

Some DomeShelter™ Structures have been onsite for over 12 years and are still going strong — a testament to the durability of the Structure.

With over 30 years of industry experience, DomeShelter Australia has developed an unrivalled knowledge in fabric shelter manufacturing, with over 8000 DomeShelter™ Fabric Structures installed in over 48 countries.

The ever evolving and dynamic nature of mining work sites necessitates accessible and durable infrastructure solutions for Workshops, Warehousing, Maintenance and Tyre Bays and many other applications. DomeShelter Australia provides trusted and durable solutions that are Engineered to Protect®. **AMR**



High Quality, Australian Made Fabric Shelters

ENGINEERED TO PROTECT

DomeShelter™ Structures are your choice for versatile, low-maintenance portable Fabric Structures that truly perform.

- Australian Made
- Unique Design Methodology
- Globally Delivered
- 30+ Years of Industry Experience



www.DomeShelter.com.au

sales@domeshelter.com.au

+61 8 9690 1100



Design your own Shelter today!



**MOVE
BANK**

**KEEPS YOUR
MONEY ON TRACK**

Whether it's financing your latest four-wheeled toy or your family home, accessing the required funds at a competitive rate isn't always easy. But, there's one Aussie bank that's shaken up the financial sector and kept the rail industry on the move since 1968.

Initially known as Railways Credit Union which supported Queensland rail workers in purchasing residential property, the bank rebranded to MOVE Bank in 2018. It has since diversified its service offering across the industrial transport and logistics sector, while maintaining its rich heritage within Australia's regional communities.

MOVE Bank operates on a national level and remains committed to helping railway workers and their families build stable financial futures.

Unlike traditional financial institutions, the member-owned bank remains focused on providing quality, competitive banking products and services to members of the rail, transport and logistics industries.

"At MOVE, 100% of our profits are

reinvested back into the business (our members), which helps us continue to deliver exceptional service, competitive rates, and a range of award-winning products that meet their individual financial needs," said MOVE Bank CEO Mike Currie

"Being an Authorised Deposit Institution means funds held with the bank carry the protection offered under the government-backed Financial Claims Scheme, providing the same level of safety as any other Australian bank. It is also fully licensed as a credit provider and adheres to the stringent regulatory criteria that govern all Australian banks."

A key differentiator is MOVE's personalised service and member-centric offerings, as well as minimised fees and highly competitive rates, all of which are focused on benefiting the financial position of its members.

Currie added it's simply about providing exceptional products and features designed to meet varying individual needs. "From home and car loans, to credit

cards, savings accounts, and insurance, MOVE offers a complete range of banking services geared toward improving our members' financial wellbeing, particularly one that fits the rail, transport and logistics industries."

The Queensland Rail Connection

Leveraging an experienced team and deep roots in the rail industry for 55 years, MOVE Bank is actively engaged in the communities in which its members live and work. This extends into educational initiatives that give members opportunities to learn and improve their financial wellbeing.

"We see education as fundamental to improving financial wellbeing, so we have representatives from different areas of the bank run seminars and lunch-and-learn sessions for Queensland Rail employees," said Currie.

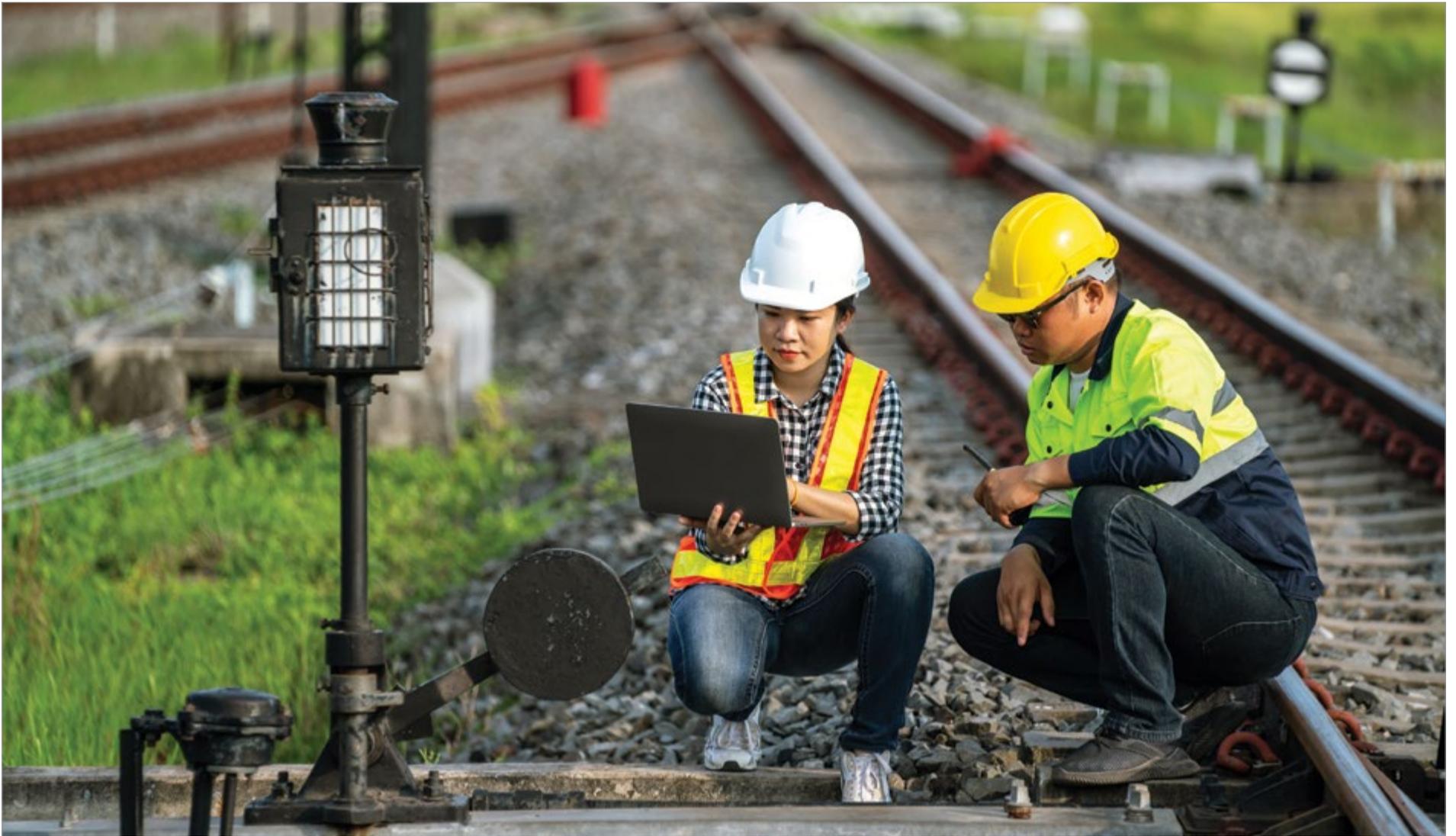
"These seminars cover everything from banking essentials, to navigating the property buying process. We also regularly engage with new Queensland Rail employees during their induction

program, introducing them to the benefits of mutual banking and discuss different financial products available."

MOVE Bank's partnership with 'Your Financial Wellness', an obligation-free financial health check and informational program, available to all MOVE Bank members. The program features self-paced tutorials, on-demand webinars, and budgeting tools that allow members to review their current financial situation and help them create a roadmap for financial success.

Members also benefit from access to the MOVE Life quarterly newsletter, which provides tips and insights around budget planning and how to manage spending during holiday seasons. The bank has a free, simple to use budget planning tool available that allows members to review their budget and determine how much disposable income they have available to spend on things such as gifts, holiday accommodation and leisure activities. **AMR**

**For more information, visit
www.movebank.com.au**



Ready to make the MOVE?

Scan the QR code to get started



LOOKING FOR A BETTER BANK?

HOME LOANS | CAR LOANS | CREDIT CARDS | SAVINGS | INSURANCE

Let's get MOVEing!

Since 1968, **MOVE Bank** (formerly Railways Credit Union) has recognised and championed the indispensable role of the rail sector in propelling Australia's development.

Our Team

MOVE Bank is a refreshing alternative to the major banks. Focusing on outstanding service and benefits for our members rather than profits for shareholders.

No matter what financial stage you are at in your life, join **MOVE Bank** today and embark on a journey toward a brighter financial future!



Why Choose MOVE Bank?

- ✓ Competitive Rates
- ✓ Award-winning Products
- ✓ Dedicated Team

1300 362 216
info@movebank.com.au
movebank.com.au

Railways Credit Union Limited trading as MOVE Bank - ABN 91 087 651 090 - AFSL / Australian credit licence 234 536

GEAR UP FOR SAFETY,

USE LAYFLAT HOSE

Safety at the workplace has been a topic of discussion since the Industrial Revolution. Companies today make employee safety a high priority when making strategic decisions. Crusader Hose offers layflat hose solutions to help companies gear up to increase their capabilities and competitiveness in the market with reliable and safe solutions.

Employee and public safety first became a concern during the Industrial Revolution of the mid-1700s. Problems were then seen as isolated 'broken parts'. Today, after the input of many generations, a holistic systems approach is employed.

Companies generally prioritise safety as a critical factor when deciding what equipment to buy. They often consider various aspects such as equipment safety features, potential risks associated with its use, and the manufacturer's reputation for producing safe and reliable products. Safety considerations are integral to protecting employees, avoiding accidents, and safeguarding a company's reputation and assets.

With a rich history spanning over 38 years, Crusader Hose has established itself as a trusted supplier of quality layflat hose to numerous industries and customers. Originally starting as a fire

hose manufacturer, the company has expanded its offerings to include fuel hose for the Australian army and other foreign government defence and energy agencies. Today, their range of layflat hose solutions includes hose that is designed for dewatering applications in the mining space. With safety factors of 2:1 pumping up high pit walls is reliable and safer to instal than rigid steel or poly pipe.

The strength and safety of Crusader layflat hose starts in the weaving process.

Many people may be familiar with ordinary, cheap layflat hose often used for pumping water out of a dam or emptying a pool. These hoses are cheap because they are braided and are designed to work in low-pressure scenarios. Once high-pressure pumping is applied, these hoses will fail. This could give a bad perception or reputation for layflat hose in general.

Crusader Hose layflat hose is not braided. Their layflat hoses are woven on European looms with interlocking warp and weft polyester yarns. It is the high-tenacity polyester fibres and the weaving method that gives their hoses a high-burst pressure of up to 100 bar. To support the hose's watertight, UV-stabilised, and abrasion-resistant properties, the hose is extruded with thermoplastic polyurethane. This is the



High-pressure pumping up high mine walls.



Crusader Hose layflat hose is woven using high-tenacity fibres.

technology that sets Crusader Hose flexible pipelines apart from ordinary layflat hose.

Several mines use Crusader Hose layflat systems for dewatering and also for high-pressure pumping up high pit walls. The feedback from the end-users is, "Awesome!" says Francois Steverlynck, Managing Director of Crusader Hose. "Together with our complete Layflat Hose Systems, you can easily pump directly up a 400m high mine wall, without the need for anchoring. The flexible hose adapts to the terrain and stays in place. The systems allow mines to fulfil the KPIs in an efficient manner, which is important to remain competitive in today's challenging environment."

An illustration of trust

One application that is critically dependent on the safety and reliability of Crusader Jetline™ layflat hose is for Flyboard aquatic and aerial acrobatics.

Performers or aspirants connect their Jetline™ hose to a jet ski. The jet ski works as a high-pressure pump and lifts acrobats 20 metres up in the air by diverting the water through the woven layflat hose.

Ritchie Gregg from Jetpack Entertainment & Events travels all over Australia with his performers, executing wild and crazy stunts with his flyboard.

Ritchie sets up his temporary pool, which is only 1.5 metres deep, in country towns such as Kalgoorlie. The jet ski uses that water to send the performers up into the air, where they do double somersaults and

JETPACK ENTERTAINMENT PERFORMERS FLY UP TO 20M IN THE AIR USING CRUSADER HOSE LAYFLAT HOSE.



Ritchie Gregg with Francois Steverlynck.

other technical gymnastic manoeuvres. It is critical that he has a safe and reliable hose on which he can depend on his life and his employees' lives. "I have come to depend on the quality of woven layflat hose from Crusader Hose," says Ritchie. "It is super flexible, and the couplings are securely attached."

Gearing up

Crusader Hose challenges the mining industry to embrace layflat hose as their new capability for pumping up high mine walls. "You don't need to take the long way out of the pit," says Francois; you can go straight up! There is no temperature derating on Crusader Hose, so it could be used safely under the baking Pilbara sun. It is flexible and easy to handle, making pipeline installation a quick and efficient process."

Fully made and developed in Australia, Crusader Hose stands by its products and is ready to service and support the mining industry with long or short lengths. Technical training and installation support are offered to ensure safe, cost-effective and independent redeployment solutions.

AMR



GOLD STANDARD IN THE MINING INDUSTRY

The iconic LEVERLINK Motor Base was developed more than 30 years ago and is the gold standard in the mining industry.

Leverlink's motor bases are designed and manufactured in Australia at Leverlink's Brisbane facility. This eliminates the often unreliable supply chain from overseas. Total production control is maintained at all times, allowing delivery targets to be met as required by the client.

Safety and Long Service are the designs' primary objective. A single mechanical

adjusting screw allows for the tensioning and re-tensioning of the v-belts without the risk of trip and slips, strain injury or working at heights. The adjusting mechanism is enclosed and lubricated avoiding unforeseen mechanical seizures. The service life is between 10 and 15 years. Refurbishment can be undertaken which will extend to life as much as 30 years. This is unheard of in today's throw away society.

For more information visit www.leverlink.com.au.

AMR



Reducing Maintenance Costs - It's your choice



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- Safety hazards

SINGLE ADJUSTING SCREW

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DONT BE LEFT IN THE DARK.



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HYDRATORQUE HAS HYDRAULICS COVERED

Hydraulic systems and their components are the lifeblood of any industrial plant equipment and earthmoving machinery. They are essentially required to shift heavier loads and generate higher forces. That's why they are common in complex systems where industrial valves, pumps, cylinders and motors exist such as excavators, front-end loaders, dump truck trays, scissor lifts, gearboxes, drill rigs, conveyors and crushing systems.

The tough conditions associated with surface and underground mining applications mean that more power is required. The larger the system, the higher the pressure or torque needed. This inevitably leads to component wear and machine breakdown. Therefore, maximising performance of these systems and protecting their critical parts requires regular repair and maintenance to prevent breakdown and reduce downtime.

Aussie owned Hydratorque has a wealth of experience in the world of hydraulics. For over 25 years, the company has provided sales, service, technical support and system engineering for the industrial mining, exploration, construction, agricultural, transport and marine sectors.

Hydratorque managing director Matt Buldo said the company's in-depth understanding of the mining industry, combined with the technical aspects of how hydraulic systems function, makes them a unique service provider.

"The application and support of hydraulic systems and components requires a high level of experience and know-how," he said.

"That's why we only work with the best fluid power manufacturers globally to deliver proven, high performance hydraulic products to meet the demands of the toughest worksites. We've partnered with brands such as Parker Hannifin, Denison, Voac, Commercial, Rexroth, Sun, Hydraforce, and Racor Filtration, to name a few."

HYDRAULIC SERVICES

A fully equipped hydraulic service centre in Brisbane enables Hydratorque to provide quality testing and repair for a wide range of hydraulic equipment. This is backed by a team of experienced technicians that undertake continuous in-house training to keep them at the forefront of their field.

In order to achieve the highest industry standards, Hydratorque's purpose-built facility features a variable drive test bench, a cylinder repair bench with high torque and long-stroke capacity, and in-house machining capabilities.

"Supported by a comprehensive service program, our service centre specialises in the repair and servicing of all hydraulic components" said Buldo.

"From piston pumps and motors, cylinders, power units and valves, to final drive, top drive and pump drive gearboxes. We have built a reputation for the repair of piston pumps and motors, providing access to genuine parts. All repairs comply with strict quality control procedures and in accordance with manufacturer's tolerances. Our technicians can also provide full inspection and root cause analysis reports as required."

When it comes to onsite diagnostics and technical support, Hydratorque supports all hydraulic systems from start to finish. With approved business partners and 24/7 field service, quick response times and emergency breakdown support, customers have unique access to services when and where they need them.

In conjunction with an in-house system design team, the company helps customers transition their projects from the design stage to full-scale operation. This involves installation and commissioning of hydraulic components and complete systems, turnkey installation of projects, as well as engineering, technical support and consultation at every stage of the process.

PERSONALISED DRILL SUPPORT

Hydratorque offers a drill support program that aims to provide drilling partners with an elite service solution tailored to their machines and site requirements. The range of solutions are designed to suit all major drilling equipment brands including



CAT, Terex, Bucyrus, Reedrill, Atlas Copco and Sandvik.

Buldo highlighted a core service the company provides is machine diagnostics, fault troubleshooting, and failure analysis.

"Whether you're running hydraulic, pneumatic, or mechanical systems, our technicians offer an unmatched level of diagnostics and testing for rotary and top hammer machines, and Cubex equipment including CANBUS based automation ready systems, and the Australian built Vigilante PLC systems.

"Additionally, we supply a full range of components, filtration audit and analysis,

component repair and rebuild, testing in either our workshop or on your site, as well as a service exchange program for popular units.

Customers also benefit from Hydratorque's detailed machine auditing and assessments. By partnering with production, maintenance and planning personnel, the company can develop deep insights of specific project and site requirements, and offer a solution that best aligns. **AMR**

For more information, visit <https://hydratorque.com.au/>

HydraTorque

Phone:
3390 7188

FLUID POWER SOLUTIONS



Australian owned company Hydratorque has provided comprehensive hydraulic sales, service, support and system engineering for over 25 years. We work with the world's leading fluid power manufacturers to provide our customers with the highest performing products for the industrial mining, exploration, construction, agricultural, transport and marine sectors.

HYDRAULIC PRODUCTS

- Pumps
- Motors
- Valves
- Filtration
- Hoses & Fittings

HYDRAULIC SERVICES

- Variable Drive Test Bench
- Cylinder Repair Bench with High Torque and Long Stroke Capacity
- In-House Machining
- Piston Pump & Motor Repair
- Onsite Diagnosis & Support
- Installation & Commissioning
- Maintenance Programs
- Service Exchange Programs

DRILL SUPPORT

- Personalised Drill Support
- Machine Fault Troubleshooting & Failure Analysis
- Hydraulic Sales, Repairs & Exchange Programs
- Machine Auditing & Assessment
- Final Drive & Top Drive Assembly Overhauls



Contact  **HydraTorque today!**

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25 YEARS
1998 - 2023

DIGGING DEEP

UNCOVERING AIR COMPRESSION LEAKS IN MINING OPERATIONS

The mining industry plays a vital role in extracting valuable resources from both the surface and subterranean layers of the Earth. Mining operations require robust and dependable equipment to ensure the safe and accurate extraction of minerals and metals.

The Importance of Detecting Compressed Air Leaks in the Mining Industry

Compressed air systems are prone to leaks, which can increase energy costs by causing the compressor to work harder. Leaks tend to occur in joints and weak points and cause fluctuations in pressure levels. This can reduce the efficiency of air-operated tools and increase the time required to complete work. Leaks also increase the runtime and unnecessary cycling of the compressor, which shortens equipment service life and drives up maintenance costs.

The Importance of Acoustic Imaging Cameras for Detecting Compressed Air Leaks in Mining Operations

Acoustic imaging cameras have become



a valuable and efficient resource for detecting compressed air leaks in mining operations. These cameras offer the advantage of swiftly and precisely pinpointing the origin of a leak, requiring minimal training from operators, even in

environments with high levels of noise and complexity. As a result, mines can promptly take corrective measures to decrease energy wastage, mitigate safety risks, and optimise the performance of their equipment.

To meet the mining industry's challenges, mining companies can turn to technology, with a particular emphasis on condition monitoring. The FLIR Si2-Pro acoustic imaging camera offers a powerful solution for condition monitoring in mining and is specifically designed to discover compressed air leaks as well as partial discharges such as corona and arcing in medium and high voltage electrical systems.

Built with 124 microphones, the FLIR Si2-Pro can detect and pinpoint even very quiet noises from a long distance, making it ideal for the harsh environment of mining operations. The FLIR Si2-Pro precisely detect, locate, and measure compressed air leaks, gas leaks, and partial discharges. Identify and quantify both minor and elusive issues from up to 200 m (656 ft) away—boosting operational efficiency and ensuring safety.

For more information about acoustic imaging cameras or about this application, please visit:
<https://www.flir.com.au/products/si2-pro>

AMR

DISCOVER THE POWER OF ACOUSTIC IMAGING IN LEAK, PARTIAL DISCHARGE AND MECHANICAL FAULT DETECTION



The FLIR Si2-Pro:

- ▶ BEST-PERFORMING LEAK DETECTOR ON THE MARKET
- ▶ REDUCE OPERATING COSTS
- ▶ INSPECT FROM SAFE DISTANCES
- ▶ AVOID CRITICAL FAILURES IN POWER DISTRIBUTION
- ▶ DETECT FAULTY BEARINGS FOR CONTINUOUS OPERATIONS

 **FLIR**[®]



CDS - THE ABLE IN CABLE

Celebrating 25 years in 2024

Cable Distribution Services is a premium cable supplier and leading distributor of quality power, communications and fibre optic cables, connectors and accessories for the electrical and communications industries.

In the energy sector, Cable Distribution Services specialises in a wide range of underground and above ground low and medium voltage power cables and systems for the mining and heavy industrial industries.

For your communications needs, Cable Distribution Services offers specialised products for mining, marine and off shore installations as well as a comprehensive range of optical fibre and copper cables and connectivity solutions.

From concept to completion, Cable Distribution Services delivers tailored cable and system solutions to meet your requirements - including design, manufacture, testing and approval of custom cables - with typically the

lowest Minimum Order Quantities (MOQs) in the industry.

Cable Distribution Services was founded by Ross Wasserman who began his cable career as an apprentice electrician in South Africa with a large cable manufacturer, commissioning and maintaining an array of cable manufacturing lines. He emigrated to Perth in 1995, working for a cable specialist, and eventually founded CDS in April 1999.

This year marks Cable Distribution Services' 25th year in operation.

Another milestone soon to be achieved is that of the company's General Manager, Ross Jackson, who next year will celebrate 40 years in the cable industry. With an extensive manufacturing, sales development and management background across the mining, power utility, marine, oil and gas, infrastructure, communications, renewables and OEM industries, Ross joined Cable Distribution Services in 2016 and has been an integral part of the company's diversification and growth.

Together with their dedicated team, they are always willing to go above and beyond to service your needs and exceed your expectations.

Comprehensive Services

Cable Distribution Services has one of the most comprehensive stock holdings in the industry available for despatch in standard packs or cut-to-length, supplied with the correct cable accessories for your project. With a global network of suppliers, they can assist in supplying items unique to you or your project and delivering them in the quickest possible time, whether by air or by sea.

An innovative strength of the business is their reverse logistic solutions and end-of-project material demobilisation model, offering best 'green business' practices, and value add services from cut-to-length cables for both power and communications.

THE RANGE

Water: One of CDS main strengths is the supply of cable for pumping and dewatering - stocking a wide range of flexible cables since their inception.

A new development in the expansion of this range is the recent release of their Aquable screened rubber cables with pilot conductors; which are a culmination of extensive R&D to ensure

their performance and suitability when installed in the often rugged conditions encountered in Australia.

Mining: Heavy duty flexible cables for open pit and underground mining operations are available in low and higher voltage configurations.

Oil & Gas: When the project demands a combination of sophisticated technology and rugged durability, CDS have the solution with a diverse range of products for the offshore and onshore, petrochemical and marine industries.

Data Comms: CDS offer end-to-end connectivity with harsh environment fibre optic cables, patch cords, fibre trays, adaptors and connectors, including custom pre-configuring and assembly of fibre optic breakout trays (FOBOTS) and pre-terminated fibre optic cables for mining, industrial and ruggedised applications, assembled in their in-house purpose-built fibre termination facility.

Industrial: A wide range of application-specific energy and communications cables including flexible, LV power, control, rubber, submersible, armoured, instrumentation, EMC/VSD and fire rated products.

Material Handling: Energy chain, drag chain, pendant, festoon and reeling cables to suit any hoist and crane application.

Cable Distribution Services aim is to be more than just a supplier, but a true partner, delivering products in full and on time, to specification, and at the lowest cost possible.

With technical experience spanning more than 100 years and the backing of some of the world's leading and most innovative cable manufacturers, their reputation is built on a history of reliability, high quality and integrity. There is a reason that they are commonly referred to as The **able** in **Cable**. *AMR*

ENERGY
CABLES



ENERGY
ACCESSORIES



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Cable Distribution Services



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CDS AQUABLE® cable is designed for both flexible and fixed installations where an electrical screen is required, indoor, outdoor, industrial, mining, quarries. VFD EMC compatible. Motor mains and submersible pump applications, in various water conditions. AD8 permanent submersion to 500m depths under certain circumstances.

APPLICATIONS:

- Designed for pumps in waste water
- (EMC) Compatibility
- Mining & Dewatering
- Industrial sites, Chemical plants
- Hazardous locations
- Seawater

FEATURES & BENEFITS

- Mechanically tough for Australian conditions
- Pilot (control) Cores (x4) included
- Flame-Retardant IEC 60332-1-2
- Australian Core Colours - Red, White, Blue, GN/YW
- Pressure Extruded EPR inner bedding
- UV Resistant
- Oil Resistant

STOCKING RANGE:

- 3core & earth (Plus 4x Pilots) 6mm² to 120mm², other sizes available on manufacture
- Available in 500m drum lengths or cut to length



CDS - Approachable, Reputable and Dependable

Freecall: 1800 GET CABLE (438 222)
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YOUR PARTNER IN SUCCESS: DRIVE PERSONNEL

In today's dynamic landscape of workforce solutions, Drive Personnel is the dependable and reliable labour hire company reshaping the way the mining, civil and construction industries in Australia meets its staffing needs. As a leading player in its field, Drive Personnel has time and time again demonstrated its commitment to excellence through focusing on its delivery of tailored solutions that align seamlessly with each client's requirements.

Thanks to a rigorous vetting process and a vast network of skilled professionals, Drive Personnel ensures that every placement meets the highest standards of professionalism, delivering top-tier talent that enables mining, civil and construction companies to thrive in their exploration and processing environments.

At Drive Personnel, we're not just about finding the right people for the right jobs. We take the time to understand what each company needs, and what each skilled individual wants, fostering long-term partnerships that go beyond simply staffing solutions. We offer strategic insights, personalised support and proactive collaboration that drive tangible results and sustainable growth for everyone involved.

Need Staff?

Finding the perfect fit for your team on-site can be time consuming and costly, but at Drive Personnel we're your strategic ally in navigating the road to provide contract workers, and helping you build a strong, reliable team that drives your mining operations forward.

What sets us apart from other labour hire and recruitment companies is our deep pool of talent and expertise. We've spent years building relationships with skilled

professionals who are ready to take on roles in the mining, civil and construction sectors, from heavy machinery operators and skilled technicians to supervisors and admin staff. Our turnaround time to find the right fit for the role you need filled is fast and efficient, delivering results that exceed your expectations every time; from supplying one individual to fill in annual leave, to a 30-person team within a day or two for shutdown, we've got the resources that will see the outcome you want.

When it comes to advantages, partnering with us will see a significant reduction in administrative burden. Recruitment is a resource-intensive process, but by working with Drive Personnel, we take care of all the logistics associated with onboarding and payroll, saving you time and money, offering contract staffing solutions that adapt to your needs. Whether you need extra hands for a short-term project or a long-term solution for ongoing operations, we've got the flexibility to meet your needs, no matter how big or small.

Need Work?

Skilled professionals are the lifeblood of every operation, and at Drive Personnel we're not just connecting people with jobs – we're forging pathways to success in the dynamic and fast paced world of mining, civil and construction.



Whether you're a seasoned mechanical fitter or boilermaker, a highly skilled operator or a superintendent, we have the developed networks to find you work that aligns with your lifestyle, expertise and ambitions. From open-pit mines to underground operations, our team works closely with leading mining companies across the country to match you with the roles you're looking for, and we have the ability to design schedules of work that suit your family and lifestyle.

But Drive Personnel isn't just about finding you a job – we're about building your career. We believe in long-term partnerships so you can thrive in your career. Single payslips assist with any future financial borrowing needs, and you're never considered 'just a number'. We help you put your best foot forward to land the jobs that will keep you engaged and excited about where life takes you, meaning our flexible approach means we can adapt to every request.

White Collar Opportunities

In a move that promises to reshape the landscape of staffing solutions, Drive Personnel's recent acquisition of **Anderselite** marks a new chapter in the journey towards our vision of industry excellence. This new partnership is poised

to revolutionise the way we access talent and navigate workforce management, now bringing Anderselite's rich history and extensive experience into Drive Personnel.

The acquisition gives us a significant increase in supplying skilled labour hire in human resources, admin and office staff, transport logistics and executives, plus so much more – showcasing a shared commitment to understanding the evolving demands of the mining workforce.

Roles

Drive personnel delivers a comprehensive range of solutions tailored to meet the diverse staffing needs of mining, including:

- Supervisors & Management
- Planning, HSE & QA, Admin
- Truck, Crane, Loader
- Plant Operators
- Operators
- Supervisors & Management
- Planning, HSE & QA
- Project & Admin Staff
- Formwork, Steel & Concrete
- Exploration & Technical Mining
- Executives, Human Resources & Admin
- Transport Logistics
- Plus so much more



If you're tired of waiting weeks, or even months, to find the skilled labour or job you need, head to our website and get in touch today. With our rapid response times, extensive network of talent, and unwavering commitment to excellence, we'll help you get ahead of the curve and seize every opportunity that comes your way. **AMR**

For more information visit
www.drivepersonnel.com.au



Drive Personnel



Building Better Teams

Drive Personnel are the leaders in civil, mining and construction labour hire, providing high quality trades committed to safe and successful project delivery throughout WA and Australia. There are numerous benefits to engaging with Drive Personnel as your preferred option.

Employers:

- Peak skilled labour supply without internal recruitment onboarding costs
- Tangible, known cost of labour versus unknown recruitment team overheads and intangibles
- Reduced admin burden for internal staff to recruit, onboard and maintain compliance and work schedules
- Significantly faster access to skilled and compliant labour, our employees are already onboarded and ready to assist
- Simple access to contingent or roster backfill employees

Employees:

- Consistent work across multiple, well-regarded clients
- Ability to design a schedule of work to suit family and lifestyle
- Variety of work projects and locations to keep you engaged
- Genuine care and interest in our employees, never 'just a number'
- A single payslip to help with any borrowing needs

We can assist with:

- ✔ Superintendents/Supervisors
- ✔ Mechanical Fitters
- ✔ Rope Access Trades
- ✔ Scaffolders
- ✔ Civil Trades – Mining and Commercial
- ✔ Electricians
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 BASELINE
ONSITE


 JOBFIT


 JOBFIT

BECOMING AUSTRALIA'S LARGEST CORPORATE HEALTH SERVICES PROVIDER

The mining industry is the key driver for economic growth in Australia and the health and wellbeing of people that work in the mining industry is critical in ensuring that the sector operates without interruption.

Jobfit was founded in 1996 and is Australia's leading provider of occupational health services specialising in pre-employment medical assessments, periodic medical assessments, health surveillance medicals and injury management services.

Jobfit is one of Australia's largest wholly owned occupational health providers with 50 clinics nationally and 350 plus staff across the country, the team includes nurses, doctors, allied health staff, located in metropolitan and regional areas.

Baseline Onsite was founded in 2010 and focuses on providing remote care services to clients through onsite specialist medical services, security, training and security to the mining, energy, oil and gas and construction industries. Baseline Onsite currently employs 250 people across the country, the workforce is a mix of paramedics, nurses, trainers, doctors and security staff.

In November 2023, Baseline onsite merged with Jobfit to create Australia's largest corporate health and site services business.

Combining our 250 onsite team members with Jobfit's 350-strong workforce will mean a bigger, stronger service offering, further supporting the occupational health and medical needs of our clients. Jobfit CEO Vikas Dogra says the merger is an exciting opportunity for both businesses.

"The merger of Baseline Onsite and Jobfit



will mean joining the forces of two highly regarded occupational health entities to create an outstanding service offering to the market," Mr Dogra said.

"We have now bought both businesses together to create this large end to end services supplier that can cater to pretty

much every corporate health need that a client has, whether they want to come into our clinic or want us to come to them remotely," Mr Vikas said.

"Baseline also sets up permanent clinics in the mining towns and remote sites, so we create clinics with doctors and

nurses to provide accessible care to our mining communities, and we also provide ambulances and paramedics to take care of emergencies."

According to Mr Vikas, the company has been growing at double digit percentages ever since the merge last year.

"With the merger we've already achieved around 15% to 20% growth this year. By coming together and exposure to multiple clients and services, cross selling has been a beneficial outcome for us in addition to our clients having accessibility to variety of services from one vendor" he said.

"We now have a better understanding of what clients need from end to end so we can help them with compliance to the legislation around employee health and wellbeing.

Jobfit has been servicing the mining industry for more than 25 years and has industry leading technology to support its clients. We have designed our systems to reduce administrative burden for our clients and make user experience great for their employees. Some of the features available are: Live clinical calendars for 50 clinics across Australia with appointment availability and to book within seconds, 24/7 Online access (any web-device), Pre-populated medical pre-sets for ease of booking candidate appointments directly by candidates, track the status and progress of medicals, Reminder function for periodic medicals, View booking and clinician notes from Jobfit back-end administration teams, Download medical reports securely online, Live database of employee's medical history, Restrict access / authority levels by user, Visibility of all activity for management and Extensive reporting capabilities. **AMR**



Improving Australian Healthcare



The partnership between Jobfit and Baseline Onsite has created one of Australia's largest corporate health and site services business.

With a combined staff of 600, we provide a bigger and stronger service offering, supporting the medical and occupational health needs of clients.

Our service offerings are:

- Pre Employment medical and work fitness assessments
- Injury Management and Prevention
- Drug and alcohol screening
- Health Surveillance
- Health and Wellness programs
- Vaccination services
- EAP services
- Onsite Medical Services including site poisons permit and compliance management
- Remote Site Security
- Safety Advisors
- Emergency Response and First Aid training

jobfit.com.au

J  **BFIT**



ROAD CONSTRUCTION SPECIALISTS

Desert Sands Cartage was founded over 30 years ago by Rex Ryles in Laverton, WA, which is known as the gateway of the Great Central Highway. As a family-owned business, we are 100% focused on providing old-fashioned, reliable customer service with a flexibility that meets customers' needs.

We specialise in supplying remote outback and mining projects in regional WA and the Northern Territory with potable water, sand, fuel and various other bulk haulage requirements.

We pride ourselves on being on time, on budget, whilst maintaining the highest possible safety standards in our field. Our comprehensive knowledge of the diverse requirements needed in remote Australia are second to none — so rest assured your project is always in the hands of skilled and respected professionals.

Our Services

Over our 30 years of operation, we have worked across transport, civil contracting, potable water supply, concrete and bulk fuel haulage. Additionally, we have extensive experience in hauling ores and associated construction materials such as sand, gravel, aggregates, fuel and potable water

into some of Australia's most remote and isolated areas.

Desert Sands has carried out annually extensive civil works for government organisations with one of the major construction projects being the Great Central Highway in WA.

Our Fleet

Desert Sands has an extensive fleet list to provide for the many varied requirements of its clients. All company owned equipment is strictly maintained in accordance with the National Heavy Vehicle Accreditation Scheme.

We have been involved in the build and construction of around 1000km of roads, including the Yalgoo to Mt Magnet Road, Fitzroy Crossing to Halls Creek sections, Roper Highway, Port Hedland to Newman, TX and RX access roads, and 450km of the Great Central Highway.

We have also worked on multiple access roads in the Central Desert Lands and South Australian Pitlands. **AMR**

For more information, visit
www.desertsandscartage.com.au
or call +61 8 9031 1326

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CARTAGE CONTRACTORS
Est. 1989



**INVOLVED IN THE
CONSTRUCTION AND
BUILD OF MORE THAN
1000KM OF ROADS**

A family-owned business, Desert Sands Cartage specialises in supplying remote projects across regional WA and the Northern Territory.

We have experience in hauling gold, nickel, concrete, sand, gravel, fuel and potable water to some of the country's most remote and isolated areas.

We have been involved in multiple road construction projects including:

- » Yalgoo to Mt Magnet Road
- » Fitzroy Crossing to Halls Creek
- » Roper Highway
- » Port Hedland to Newman
- » TX and RX access roads
- » 450km of the Great Central Highway

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- Coal Mine Methane Extraction
- Flotation Cells, Heap Leaching, Acid Plants
- Pneumatic Conveying

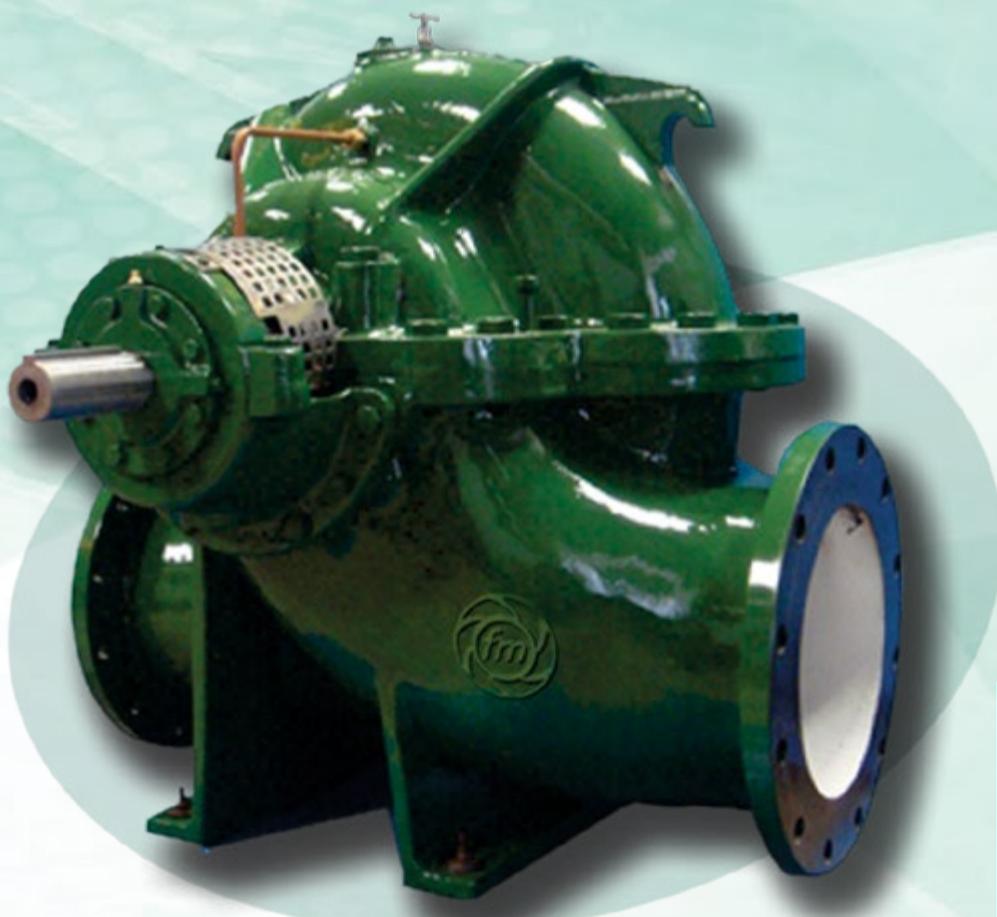
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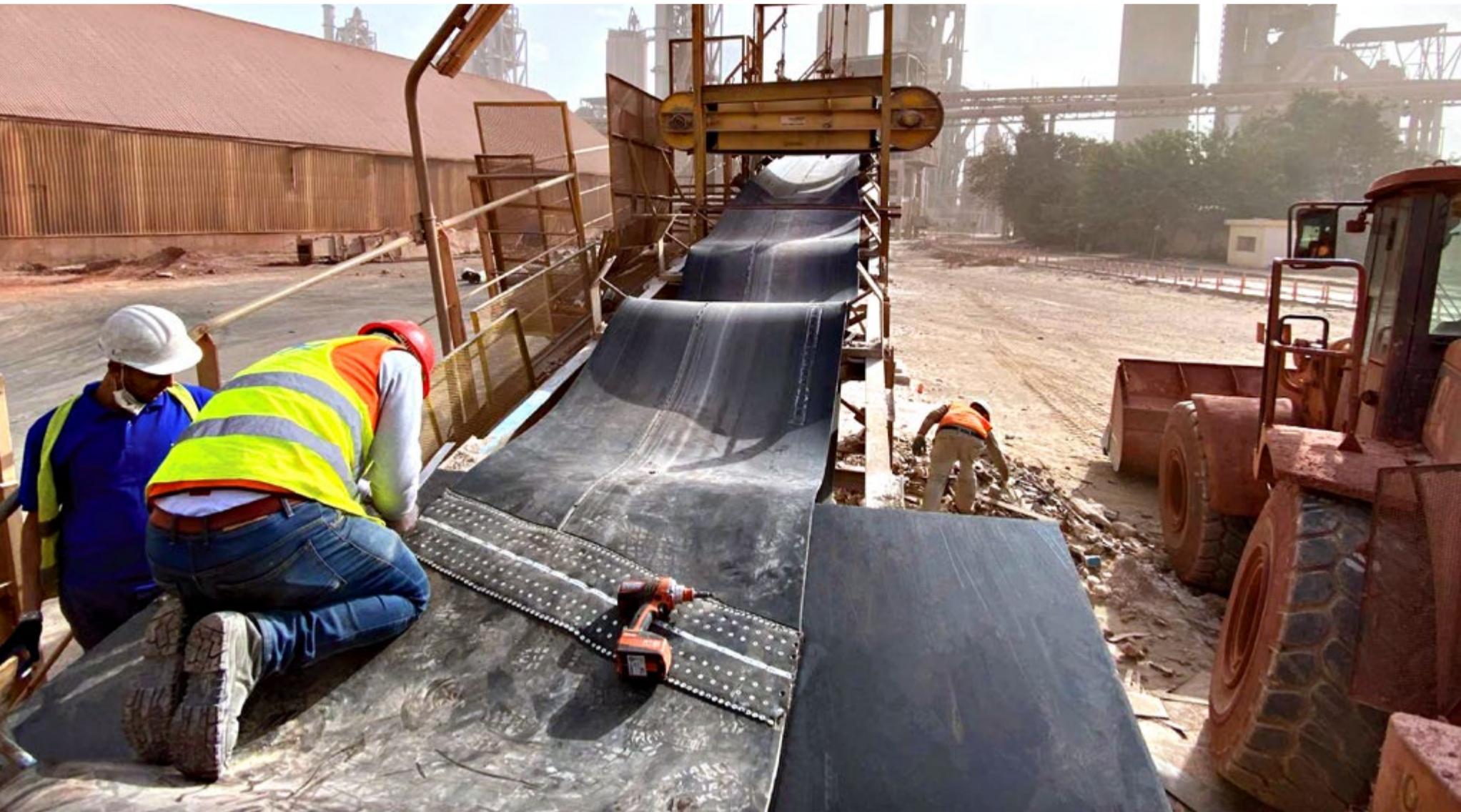
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MLT SUPER-SCREW® CASE STUDY

The only Super-Screw splice joint that offers flexible, permanent belt join that is innovative and easy to install

In this case, a phosphate mine long transfer conveyor belt had an emergency breakdown during production. A request for belt splicing by conventional hot splicing on a new belt was too challenging and complicated.



Customer Issues

Conveyor downtime was 16 hours with the previous way of belt splicing and on top of that, they needed 8 people to splice the belt on site.



Customer Belt Technical Specifications

- Belt type: Ferroflex 2000N/mm
- Belt length: 2.2km
- Belt width: 1600mm
- Product being conveyed: Sterile Phosphate

MLT Answer

The only solution that made it possible without having expensive downtime was the use of MLT SUPER-SCREW® Original flexible splice joint that can be quickly installed on-site. This has resulted in reduced conveyor downtime (5 hours) and the number of people allocated to belt splicing.



MLT MS® FASTENER CASE STUDY

The only screw-on metal fastener that is innovative and easy to install

The MS® Fastener is an innovative and fast solution to join your belts by simply screwing them together. Designed and patented by MLT, this mechanical splice is extremely easy to install. MS® Fastener is a metal fastener to be installed with screws. The MS® falls into the category of truly revolutionary in the metal fastener market, as it is more economical, practical, and safe to use.

Customer Issues

A coal-powered power station in Central Coast NSW had multiple emergency belt breakdowns on all its coal feeder conveyors, a quick solution was required to rejoin new belts on-site with a metal fastener without the need for special tooling or installation templates.

Customer Belt Technical Specifications

- Belt type: PN450, 3 ply, M grade
- Belt width: 900mm
- Product being conveyed: Coal

MLT Answer

The only solution that made it possible without having expensive downtime was the use of MLT MS® Fastener which can be quickly installed on-site with a hammer and a cordless drill driver. Conveyor downtime has been drastically reduced as well as being able to install during a small window of opportunity for shutdown with production up and running again shortly afterwards. **AMR**



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A Cut Above the Rest

HD Plasma and Laser Cutting Services provides an innovative and dynamic profile cutting service to all steel manufacturing industries within Australia.

The purpose-built, multi-function, steel processing business located in Bibra Lake, WA, is seen among the leaders in the steel cutting industry.

Laser Cutting

The technology of the HD Plasma and Laser Cutting Services machines delivers superior performance, giving the ability to provide clients with exceptional quality, together with 24-hour operations, shorter lead times compared with other conventional laser cutting machines.

- Cutting table size 4000 x 2000mm
- Capable of processing up to 20mm thickness mild steel
- Capable of processing up to 20mm thickness QT Material
- Capable of processing up to 32mm thickness aluminium
- Capable of processing up to 25mm thickness stainless steel

Plasma Cutting

HD Plasma and Laser Cutting Services operates three plasma machines - one Kinetic K4000 and two Kinetic K5000. These state-of-the-art, heavy duty combination plasma/oxy/machine centres can process a wide variety of materials at an extremely fast rate.

The 62m plasma cutting bed, together with 24-hour operations, allows high volumes of cutting to be achieved with short lead times.

- Counter sink/counter bore
- Drilling - 3mm up to 60mm
- Plasma cutting - 3mm up to 50mm
- Oxy-cutting - 60mm up to 300mm
- Beveling - up to 50mm with maximum of 45°

Steel Plates

HD Plasma and Laser Cutting Services holds steel plate in stock.

Plate is sourced from quality local and imported steel mills, to cut a wider range of materials at a greater thickness range than most of its competitors. **AMR**



THE STATE-OF-THE-ART, HEAVY DUTY COMBINATION PLASMA/OXY/MACHINE CENTRES CAN PROCESS A WIDE VARIETY OF MATERIALS AT AN EXTREMELY FAST RATE.



GRADE	THICKNESS (mm)
AS 3678-250	UP TO AND INCLUDING 300mm
AS 3678-350	UP TO AND INCLUDING 300mm
FLOOR PLATE M/S	UP TO 10mm
BOILER PLATE - ALL GRADES	UP TO 80mm
QUENCHED AND TEMPERED	UP TO 80mm
CARBIDE OVERLAY	UP TO 40mm
ALUMINIUM PLATE	UP TO 32mm
PGI, ZINCANEAL, GALVANISED & COLORBOND	UP TO 6mm
STAINLESS STEEL - ALL GRADES	UP TO 40mm

A cut above the rest



HD Plasma & Laser Cutting Services Pty Ltd is a purpose built, multi-function, steel processing business located in Bibra Lake, Western Australia.

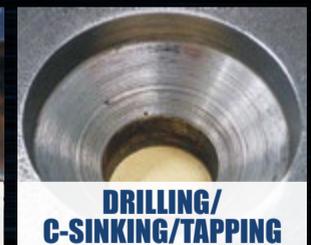
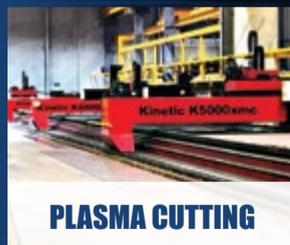
We can deliver an innovative and dynamic profile cutting service to all steel manufacturing industries within Australia.

HD Plasma & Laser Cutting Services philosophy of progressive service to our customers is what is bringing us to the forefront of the steel cutting industry.

A continual process of system and service development and refinement is where our key advantage lies. We constantly find new ways to add value to the service we deliver to you.

Progressive service and quality is about staying one step ahead.

Services



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www.hdplasmacutting.com.au

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 Email: sales@hdplasmacutting.com.au

DIGITALISING ORE FLOWS

FOR PRODUCTION AND PROCESS IMPROVEMENT USING SCANTECH ROCKS2DATA ANALYSERS

Pursuit of improvement opportunities inevitably requires more data – data from material flows not currently measured, and high quality data that provides confidence in decisions based on that data. Such data is generated through representative real-time measurement of conveyed material quality at various points between the mine face and mill feed. Real-time data enables effective decisions that improve operational performance.

Scantech International has developed and implemented a range of conveyed based analysers specifically for this purpose.

GEOSCAN GOLD is a premium elemental analyser featuring the highest specification prompt gamma neutron activation analysis (PGNAA) technology available. TBM moisture analysers utilise transmission microwaves to provide reliable moisture measurement in many commodities.

Sizescan is a next-gen 3D Infrared camera technology used in PSD (particle size distribution) and FOD (foreign object detection) applications with many demonstrable advantages over commonly used systems.

GEOSCAN GOLD is proven in multiple commodities to provide multi-elemental data each thirty seconds of conveyed flow at high precisions at throughput rates up

GEOSCAN-SizeScan-TBM for real time multi-elemental, PSD and moisture data.

to 15,000 tph irrespective of belt speed, particle size, mineralogy, dust, moisture or segregation/layering. Many elements from carbon upwards are measured. Moisture data and Sizescan data is available every few seconds ensuring that measurements can be combined and utilised for parameters that may not be directly measurable, such as ore hardness. Moisture data on its own or in combination with particle size data can be used for material flow control (e.g. indicating stickiness and clumping), dust management, dry tonnage determination, metal accounting, dewatering optimisation, and TML (transportable moisture limit) monitoring.

Scantech's Rocks2Data approach ensures operations have access to reliable, frequent, accurate measurement data to manage ore supply quality and hence feed quality and process performance. Improvements in ore quality and consistency of process feed through bulk sorting to remove coarse waste produces major benefits including better process recoveries.

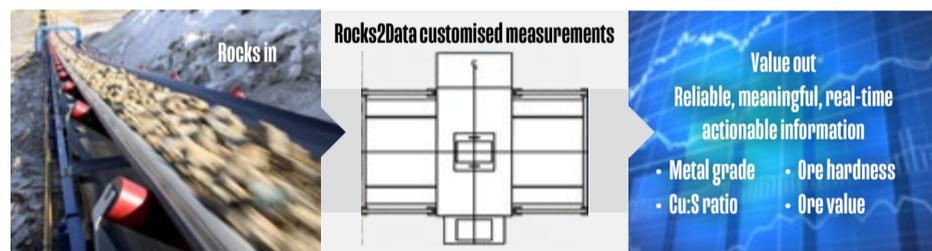
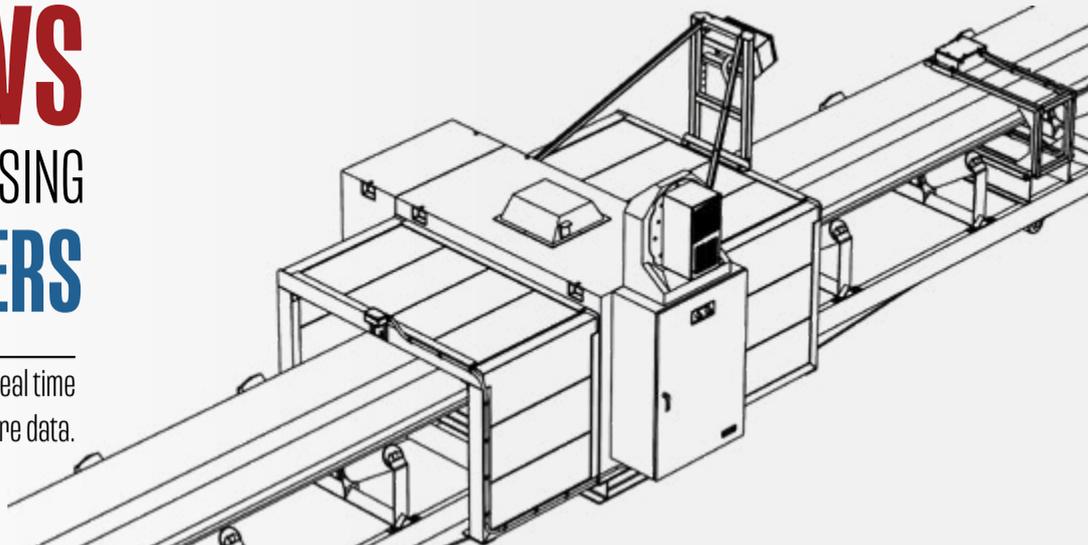
Rejecting waste generates major savings in energy, water, grinding media, and reagent consumption and reduces fine tailings generated per tonne of concentrate or product.

Reducing process feed quality variability alone can deliver up to 10% improvements in metal recoveries as a step change for mining operations. Bulk sorting has been shown to reject 5 - 20% of feed tonnes and increase feed grade by 10 - >20% while conveying material at full production rates. Representative data produced by bulk sensing technologies on post-crusher conveyed flow provides a representative

measurement of mine product and plant feed that enables effective ore reconciliation, metal accounting, ore tracking, ore blending, bulk sorting, feedback to mining teams and feed forward control for process operators.

The enabling technologies are vital for achieving improvements in process performance, resource utilisation, ESG outcomes and sustainability of mining operations.

For more information, visit www.scantech.com.au
AMR



GEOSCAN GOLD

Premium Quality On-Belt Elemental Analyser for Minerals

World first **GOLD** analyser for conveyed ore, unique capability, proven technology, digitalising ore flows through Rocks2data customisation module.



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Mexico's Pemex Offshore Crude Piping in 2015 with HPC® Coating's fresh application with RUST GRIP® corrosion prevention and ENAMO GRIP® protective industrial coating. An average temperature reduction of 55% to a surface below 50°C.

REVOLUTIONARY CERAMICS THERMAL INSULATION COATINGS ADDRESSES CUI, COSTS SAVINGS, CARBON & SAFETY

In an era where sustainability, energy efficiency and cost control are paramount for transforming business, the current methods of insulation are failing.

The advent of proven and long established ceramic thermal insulation coatings represents a monumental shift in mining and energy sustainability practices. One of the most notable breakthroughs in this field comes from Superior Products International II, Inc., with their HPC® Coating. This innovation has not only earned a first with the prestigious EPA ENERGY STAR Energy Saving Award but has also set a new standard in addressing the perennial issue of corrosion under insulation (CUI), decarbonisation and cost savings.

Award-Winning Innovation

The recognition of HPC® Coating by the US Environmental Protection Agency (EPA) underscores the significant energy savings and environmental benefits HPC® Coating brings to the table. Applied at Georgia-Pacific's Naheola paper mill digester tank, it achieved an impressive 49% reduction in energy consumption, amounting to annual savings of \$332,000. This accomplishment highlights the potential of HPC® Coating to transform energy efficiency across many industries.



Mexico's Pemex Offshore Crude Piping in 2024 showcasing HPC® Coating's ability to withstand harsh oceanic conditions while providing energy efficiency, reducing maintenance and preventing corrosion and still keeping the average temperature reduction. Photos credit: CS&A - SPI Coatings Distributor Mexico.

A New Era of Insulation Technology Stops CUI

HPC® Coating distinguishes itself from traditional insulation solutions and other coatings through its innovative, 35 years of research and development in ceramic technology. Unlike conventional methods that rely on air transfer it also allows for moisture transfer, HPC® Coating differentiates by using vacuum-sealed barrier materials that very effectively prevents heat loss, reduces energy consumption and combats CUI. Its versatility is further demonstrated in its application across a wide temperature range, from ambient to 650°C, making it the most viable option for a multitude of industrial uses.

Proven Performance in Harsh Environments

The real-world efficacy of HPC® Coating has been proven in some of the most challenging environments. For instance, its application on Mexico's Pemex Offshore Crude Piping in 2014 showcased its ability to withstand harsh oceanic conditions while providing energy efficiency, reducing maintenance, and preventing corrosion. This level of performance has solidified HPC® Coating's reputation as a reliable and effective solution for thermal insulation and corrosion prevention unmatched by any other in the market. Ten years later the coating is holding strong with no maintenance, no shutdown and no corrosion.

Beyond Theory: Field-Tested Success

The partnership between NEOtech Coatings, Australia's distributor and Superior Products International II, Inc., exemplifies the practical application and success of

HPC® Coating. Through collaborations, including with NASA since 1989, which has demonstrated this technology is more than theoretical, steady state lab assumptions from new coatings but a proven solution for slashing energy loss, saving costs, and offering unparalleled durability. As industries in Australia and New Zealand are adopting this advanced and premium technology, the potential for widespread impact and savings will be a game-changer.

Advancing Sustainable Practices

The thermal insulation coatings distributed by NEOtech Coatings have garnered attention for their proven field results and longevity. Unlike traditional insulation methods of jacketing and wraps that have struggled with energy efficiency and corrosion, HPC® Coating provides tangible results, validated by independent engineer testing and celebrated with an EPA award. These advancements are critical as industries look to tackle the challenges of decarbonization and embrace more sustainable practices.

Personnel Protection Reaches New Standards

Protecting surfaces for personnel is essential for ensuring workplace safety, meeting regulatory compliance, and maintaining operational efficiency. HPC® Coating significantly reduces the risk of accidents and injuries, such as burns or exposure to hazardous materials, thereby preventing unsafe work environments. HPC® Coating can be engineered to a maximum surface temperature of 50°C with high heat underneath ensuring that the surface is safe to touch for much, much longer than 5 seconds. Ultimately, these protective measures are crucial for the overall productivity, safety, and sustainability of an organisation.

Unprecedented Cost Savings

Adopting HPC® Coating offers significant financial and operational advantages, with the potential to save millions annually across facilities, as evidenced by Georgia-Pacific's returns. The coating not only promotes energy efficiency but also contributes to substantial savings by reducing repair costs, minimising downtime, and contributes directly to the bottom line making any CFO happy. With a conservative estimate showing potential savings of \$10 million across 30 plants per annum, and the possibility of exceeding \$20 million with multiple units per plant, HPC® Coating emerges as an essential investment for modern industries. Its implementation not only promises remarkable returns but also supports reduced maintenance, less corrosion, and lower carbon emissions, underscoring its comprehensive benefits.

A Sustainable Future with Ceramic Thermal Insulation Coatings

The advancements represented by HPC® Coating ceramic thermal insulation coating, marks a pivotal moment in industrial sustainability efforts. With proven field results in energy savings, corrosion prevention, and safety enhancement, the adoption of this technology will lead to transformative changes across the mining and energy sector. As industries worldwide continue to seek efficient, sustainable solutions, the role of proven, tested and engineered ceramic thermal insulation coatings in shaping an even more energy-efficient future on every level. **AMR**

SOURCE:

NEOtech Coatings Australia

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Game-Changing Thermal Insulation Coating

Energy Savings • Decarbonisation • Long Lasting
Reduced Maintenance • Personnel Safety • Stops CUI

35 Years of Proven Field and Lab Thermal Insulation Coatings



EPA ENERGY STAR Energy Saving Award

49% Energy Savings



HPC® Standard Ambient up to 204°C

HPC®-INT 204°C up to 426°C

HPC®-HT 426°C up to 650°C



HPC® Coating Maintains Optimum High-Heat Temperatures

For companies that depend on optimum thermal systems, sustainability and saving money, **HPC® Standard, HPC®-INT** and **HPC®-HT Coating** present a proven, innovative and immediate solution to a changing future. **HPC® Coating** is formulated to prevent the loss of conductive and radiant heat from pipe and vessel surfaces ranging from **ambient up to 650°C**. This increases the overall heat efficiency of any fluid or gas in use.

HPC® Coating will hold heat in a transmission pipe for longer distances than conventional pipe insulation, far more effectively and reduce emissions for a hotter burn. **HPC® Coating** as a water based coating it can also be applied to live pipes which reduces the need for shutdown and creates quicker application times.

In today's age of raising energy costs, greenhouse gas decarbonisation, personnel protection and CUI risk reduction, companies need next generation, proven high-heat insulation solutions that work in the field.

Experience the benefits of **HPC® Coating** and see it transform your results. The world leader of thermal insulation coatings globally and an **EPA ENERGY STAR Energy Saving Award with 49% energy savings*!**



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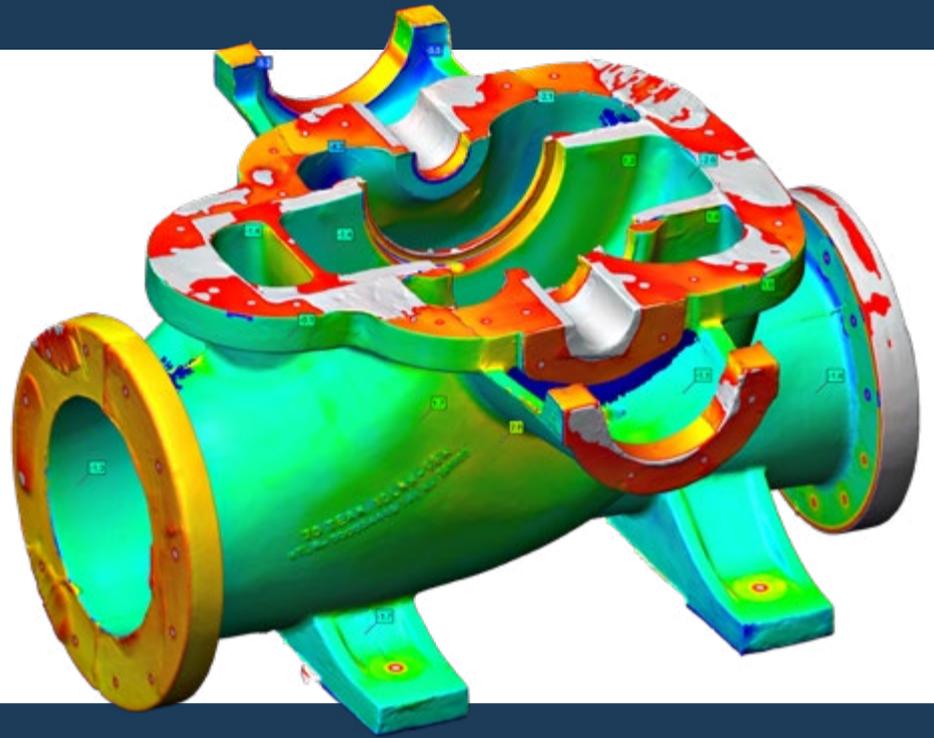
SUPER THERM®
Heat Neutralizer...Heat Block Insulation Coating



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COATINGS AUSTRALIA
Future Proof with Tough Protection®



*49% energy savings or estimated \$332,000 annual savings on a single digester tank based on a 2023 Georgia Pacific Engineers report.



Revolutionising Mining Equipment with 3D Technology

In the realm of Australian mining, innovation is not just a buzzword but a necessity. The industry faces mounting pressures to reduce operational costs, elevate safety standards, and meet stringent environmental targets. Amid these challenges, 3D technology emerges as a game-changer, especially in engineered mining equipment. At 7D Team, we are not just using this technology; we are setting new benchmarks in mining machinery performance and longevity.

From Laser Scanning to Enhanced Performance

At the heart of our technological expertise is 3D laser scanning. This isn't about mere replication; it's about transformation. We start by capturing the 'as built' dimensions of site-installed equipment, moving beyond traditional 'as drawn' design intent. This meticulous approach enables us to identify and address the wear and tear on machinery with extreme precision.

Our engineers laser scan worn components, then convert these detailed point clouds into solid 3D models, creating visual heat maps to analyse wear patterns. This isn't just a technical exercise; it's a collaborative effort with our clients, using augmented reality (AR) to visualise and refine solutions that extend equipment life and enhance performance.

Augmented Reality: A New Dimension in Collaboration and Training

AR is more than a tool for us; it's a bridge to better communication and understanding. By visualising machinery and proposed modifications in real-time, we facilitate a collaborative environment that speeds up decision-making and ensures that the final product meets exact site requirements. This technology also plays a pivotal role in training, allowing staff to interact with the new equipment virtually before it even arrives on site. Use the QR on the right to view a pump design in AR.

Prototype to Production: A Seamless Journey

Our transition from concept to reality is streamlined through 3D printing. Prototypes are swiftly created, tested, and refined. Once perfected, we move to production with precision, using 3D printed wax or CNC machined tooling. This not only speeds up the manufacturing process but also guarantees that every component fits perfectly, ensuring operational success from day one.

Wear Patterns and Heat Maps: The Science of Sustainability

Our commitment to improvement doesn't stop at installation. We continue to monitor the equipment's performance, again using laser scanning and heat maps to further study wear patterns. This data-driven approach allows us to refine our designs continuously, ensuring that they not only meet but exceed the original performance standards, contributing to the mine's operational efficiency and environmental sustainability.

Case Study:

The Bartail Pump Innovation

The Bartail range of pumps, designed for underground mine dewatering, exemplifies our commitment to innovation. These pumps are not just replacements; they are enhancements, offering significantly longer wear life and reduced power consumption. Their success has not only benefited our clients but also captured the attention of industry leaders, by demonstrating how innovation can reclaim market share and set new industry standards.

Advanced Solutions for Complex Challenges

Our journey doesn't end with dewatering pumps. We're constantly exploring new territories, like the advanced slurry pump

range we developed for Multotec South Africa and the innovative Sandgroper Seal project, pushing the boundaries of what's possible in mining equipment engineering.

Future Vision and Innovations

Looking ahead, 7D Team is excited to introduce the next generation of smart pumps equipped with IoT sensors, enabling predictive maintenance and real-time monitoring, significantly reducing downtime and operational costs. Our R&D is also exploring the integration of AI in 3D modelling to predict wear and optimise design, ensuring our products are not only efficient but also future-proof.

Industry Commentary:

Shaping the Future of Mining

The mining industry is on the cusp of a technological revolution, with 3D technology playing a crucial role in shaping its future. As we move towards more automated and environmentally friendly operations, the integration of 3D technology in equipment design and maintenance will become increasingly vital. 7D Team is at the forefront of this transformation, driving innovation and setting new standards in mining equipment efficiency and sustainability.

7D Team's use of 3D technology is not just revolutionising mining equipment but also redefining the industry's approach to efficiency, safety, and environmental responsibility. As we continue to innovate and lead in this space, we invite the industry to join us in this exciting journey towards a more sustainable and technologically advanced future. **AMR**



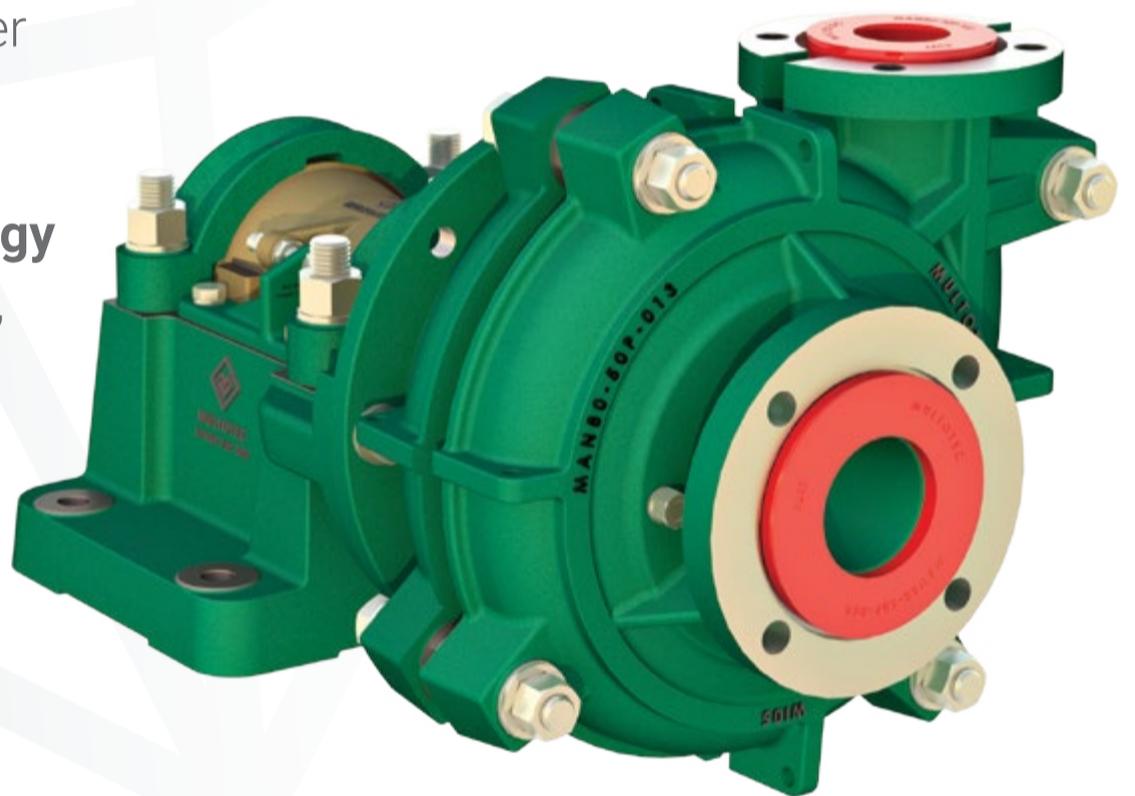
For those keen to explore the cutting edge of mining equipment technology, 7D Team is leading the way. Join us in shaping the future of mining engineering and contact us at support@7dteam.com



7D Team

Building a safer and more sustainable future in mining

7D Team is a pump designer and manufacturer. We use advanced engineering processes and **3D technology** to improve existing designs, making mining equipment more efficient and with a longer wear life.



Services Include:

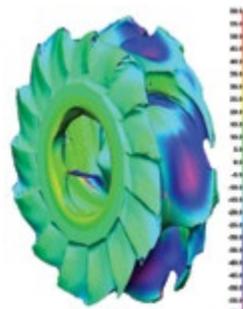
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Finished Tank With Top coat.



NanoPrep Tank Coating.

KEY BENEFITS INCLUDE:

- Single Pack Product. Can be applied with airless spray gun
- Significant down time reduction
- Exceptionally safe to use
- Chemically reacts for very high adhesion and top performance
- Quick drying saves valuable time
- Chemically transforms rust and bonds to the substrate
- Nanofusion prevents under film corrosion for long term protection
- Non-hazardous, No VOC's, environmentally friendly and non-flammable
- High tolerance to chlorides
- No Blasting required or heavy PPE
- Suitable surface preparation for many existing compatible topcoats
- Outstanding long-term durability (Estimated 15+ years to first maintenance in many environments)

NANOPREP: THE SAFE AND EFFECTIVE ALTERNATIVE TO GRIT BLASTING

Replace conventional grit blasting with a high-pressure water wash and our reactive primer: NanoPrep

NanoPrep surface preparation technology allows industrial coating applications in areas where it is difficult, cost prohibitive or impossible to perform surface preparation by abrasive grit blasting.

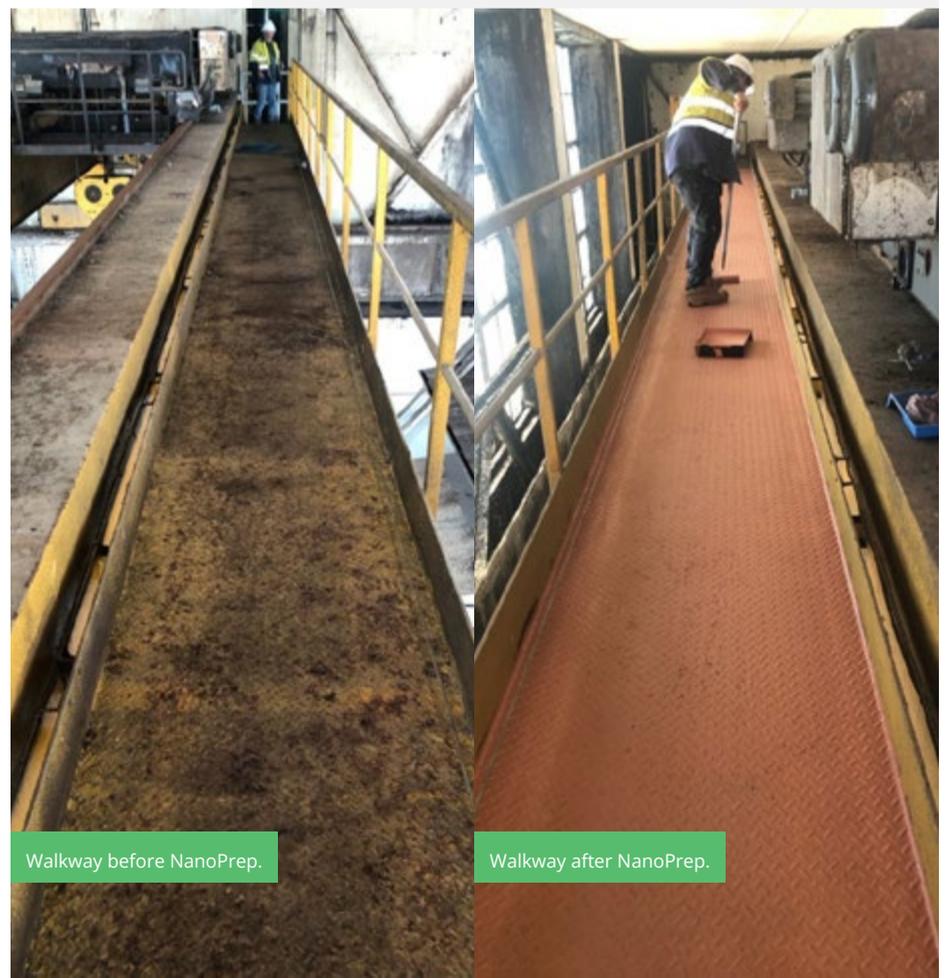
NanoPrep only requires a simple high-pressure wash before the product can be sprayed, rolled or brush applied. NanoPrep is a waterborne, acrylic co-polymer composition that reacts and cross-links with rusted steel surfaces, clean steel, painted steel, aluminium and galvanised steel surfaces to create superior anticorrosive properties. Independent testing has shown very high adhesion results to the substrate whilst also preventing under film corrosion.

NanoPrep's advantages come from the chemical reaction which takes place, creating a layer of iron phosphate. Being an impermeable material, this iron phosphate layer protects the steel from any reaction with oxygen. This is key for stop-

ping any underfilm corrosion. When the coating is damaged to expose the bare steel, the spot will rust, but the rust will be contained to the damaged spot while the iron phosphate around the damaged area will prevent any further oxidation.

Once applied to the surface, "Nanofusion" takes place, enabling deep penetration into the rusted substrate creating a stable, high bond strength base to which many non-solvent based or low solvent content topcoats can be applied. Due to the acid-based nature of the product, NanoPrep has a very high tolerance to any chlorides on the surface, making this anti-corrosion coating very versatile and easy to apply successfully.

NanoPrep contains no volatile organic compounds (VOCs) and is non-toxic. As a single pack, water-based primer, the product is exceptionally easy to apply for a fast and effective solution to rusting steel on any mining site. **AMR**



Walkway before NanoPrep.

Walkway after NanoPrep.



Nano Prep

Just Pressure Wash & Coat!

Replace Abrasive Blasting with a simple High-Pressure Wash & Coat

NanoPrep is fast becoming the go to product for simple, long lasting, cost effective and safe remediation of corroded structures in the mining industry Australia wide. Looking for a high quality, cost effective alternative to grit blasting? Look no further.

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Belzona Protective Coatings and Repair Composites

Repairing abraded equipment surfaces while keeping a plant in service is difficult. *Belzona manufactures wear-resistant repair composites for dry abrasion and immersed conditions. The ceramic coatings and sprayable polymer composites have a proven track record of significantly slowing down erosion and can be applied in-situ while preventing downtime and loss of production.*

Solutions For The Mining Industry



Conveyor Belt



Belzona 2211, 2311



Shaft



Belzona 1111



Cold Bonding



Belzona 1111, 1121



Pump



Belzona 1311, 1391S/T



Metal Pitting



Belzona 1111, 1511



Concrete Repair



Belzona 4111, 4131



Pipe Elbow



Belzona 1511



Vessel and Tank



Belzona 1523, 1593





Empowering Mines Worldwide: Discover Belzona Solutions

In the dynamic world of mining, where relentless wear, corrosion, and chemicals can wreak havoc on equipment, Belzona emerges as the ultimate safeguard for durability. Offering a comprehensive range of polymeric metal and rubber repair composites, along with robust protective coatings and linings, Belzona has been a trusted ally to the mining industry for decades.

Reliable Defense in Harsh Conditions

Belzona's unique materials stand as formidable defenses in the toughest mining conditions. Engineered to endure harsh elements, these remedies act as protectors of equipment durability and longevity. Erosion, corrosion, and abrasion are transformed into manageable hurdles through Belzona's cutting-edge technologies.

Cost-Efficient Solutions for Enhanced Uptime

Mining operations cannot afford extended periods of downtime or excessive labor expenses. Belzona steps in with cost-effective measures that eliminate the necessity for equipment replacement. Belzona's solutions are strategic investments in the continuity of operations.

Resisting Abrasion

Belzona's abrasion-resistant linings provide relief from abrasion and erosion. Whether it's pipe elbows, chutes, or hoppers, these linings act as protective shields, absorbing the impact of abrasion and sparing equipment from undue wear. Belzona 1812 (Ceramic Carbide FP), for example, significantly decreases abrasion's effects and offers

substantial savings in terms of time and expenses. Also, Ceramic-reinforced epoxy composites like Belzona 1811 (Ceramic Carbide) are engineered to bring new life into damaged screw conveyors and ensure sustained resistance over time.

Reviving Pumps to Their Prime

Even the most battered pumps can experience rejuvenation through Belzona's expertise. From liquid vacuum pumps to centrifugal counterparts, even those that seem beyond repair can be revitalized. Belzona 1212 seals cracks and gaps in pumps with a cold-curing touch. Belzona 1311 (Ceramic R-Metal), a chemical-resistant coating, safeguards equipment in harsh corrosive environments.



Coatings that Defy Erosion and Corrosion

Belzona offers an array of coatings that serve as a robust shield against erosion and corrosion. At the forefront is Belzona 1321 (Ceramic S-Metal), engineered to provide erosion and corrosion resistance to metal surfaces. Alongside it, Belzona 1341 (Supermetalgilde) demonstrates remarkable efficiency by significantly enhancing pump performance. For new installations, the improvement can reach up to 7%,

while refurbished machinery can experience an astonishing 20% surge.

Precision in Restoration

Belzona's range of cold-applied solutions offers effective remedies. Whether tackling bearing issues, wear, or lubrication challenges, Belzona provides solutions that bridge gaps. Notably, Belzona 1131 (Bearing Metal) stands out, establishing a lubrication-rich, friction-free environment. For urgent situations, Belzona 1212 swiftly acts, binding with impressive efficiency.

Concrete Repair Solutions

Belzona's concrete repair products are the go-to solution in mines around the world for repairing damaged concrete, especially from chemical attack. Belzona Magma Quartz is chemical and abrasion resistant, has three times the compressive strength of concrete along with far greater adhesion properties when applying to existing concrete.

Unveiling a Future of Mining Fortitude

As mines forge ahead, Belzona's solutions remain steadfast as emblems of endurance. More than products, these solutions embody resilience, standing strong against mining's most formidable challenges. Join the other empowered mines around the world—uncover the true potential of Belzona solutions today.

TAKE CONTROL OF YOUR OPERATIONS WITH PROTOBLAST

Established in 1975, Protoblast has emerged as a cornerstone of excellence in the abrasive blasting industry. With decades of experience under its belt, Protoblast's legacy is deeply rooted in Australian craftsmanship and unwavering integrity. What sets Protoblast apart is not just its history, but its steadfast commitment to personalized service and continuous advancements. From its humble beginnings, Protoblast has consistently strived to deliver tailored solutions that meet the unique needs of each client. Moreover, Protoblast's dedication to research and development ensures that it remains at the forefront of the industry, offering cutting-edge technologies that enhance efficiency and drive down operational costs.

Why Choose Protoblast?

Choosing Protoblast means opting for a legacy of excellence that spans generations. With a reputation built on Australian craftsmanship and integrity, Protoblast is the partner of choice for businesses seeking unparalleled quality and reliability. Protoblast's commitment to personalized service ensures that every client receives solutions tailored to their specific requirements. Whether it's a small-scale project or a large-scale operation, Protoblast goes above and beyond to deliver results that exceed expectations. Furthermore, Protoblast's investment in research and development sets it apart, allowing the company to offer innovative solutions that drive efficiency and maximize ROI. When you choose Protoblast, you're not just selecting a supplier – you're investing in a partnership built on trust, reliability, and innovation.

Protoblast's 2023 Highlights

The year 2023 was a testament to Protoblast's commitment to excellence, with significant milestones achieved across various projects. One standout example is Sulzer, a long-time client who experienced remarkable savings and performance improvements following Protoblast's upgrade of their blast chamber's dust collector and abrasive recovery system. Similarly, Janbay, a player in residential construction, benefited from Protoblast's Section Blast Machine, which enabled them to streamline operations and offer same-day delivery services. Protoblast is a proven provider of cost-effective solutions, consistently driving client success through efficiency enhancements, cost reductions, and performance improvements.

WHAT WE OFFER

- ✓ Abrasive Recovery Systems
- ✓ Airless Blast Machines
- ✓ Section Blast Machines
- ✓ Dust Collectors

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CONTROL YOUR QUALITY
CONTROL YOUR LEAD TIME**



EFFECTIVE PROTECTION FOR STEEL AND CONCRETE COMPONENTS

Steuler's rubber linings provide effective protection for steel and concrete components against chemicals, mechanical attack and organic contaminants.

Depending on the medium and temperature, Steuler uses materials based on natural rubber, halobutyl rubbers, chloroprene and styrene-butadiene rubbers.

Steuler's rubber linings are used at temperatures up to about 120°C. A unique feature is its KERABUTYL HT, which extends the application range of rubber linings up to 150°C.

Rubber linings offer:

- high chemical resistance to a wide range of different media;
- high flexibility, which allows use even with movement in the substrate;
- high resistance to abrasive loads;
- high resistance against diffusion.

As a full-service supplier, Steuler offers the optimum quality for every application, every timeframe and every installation situation.

Steuler has extensive internal tests to assess their rubber lining's chemical resistance and many years of experience in application and external tests, such as technical approvals or confirmation of suitability in the potable water sector.

ON-SITE RUBBER LININGS

Steuler's on-site rubber lining systems are

the means of choice when the application of rubber lining is required directly on-site at the construction site or at our customer's plant.

They are used, for example, when vessels are too large and heavy for transport or vulcanisation would be technically impossible or too time-consuming.

For large or built-in vessels, Steuler draws on a range of rubber linings that can be vulcanised on-site without the need for an autoclave.

These rubber linings achieve similar properties to autoclave vulcanised materials without the need to transport the vessels to be lined.

If on-site vulcanisation is not possible, self-vulcanising grades that vulcanise even at ambient temperature can be used. Alternatively, pre-vulcanised grades can be used, which are ready for use just a few hours after bonding.

The focus is on easy transport of the sheets

already vulcanised at the workshop, extremely safe processing with Steuler's new KERATEX adhesive, as well as fast commissioning.

WORKSHOP RUBBER LININGS

For transportable components such as smaller tanks, pipelines and filter plates or mobile units such as transport vessels and ISO tank containers, rubber lining at the workshop is an option.

Thanks to the use of unvulcanised and thus easy-to-process rubber sheets, even highly complex components such as filter plates or fans can be lined without any problems.

The final vulcanisation in the autoclave leads to optimum adhesion in the seams and between rubber and steel.

Steuler's materials for workshop rubber linings are optimised for easy application in combination with maximum chemical and thermal resistance:

From conductive hard rubber linings with

high tolerance to organic contaminants even at temperatures above 100°C to soft rubber linings for the alternating transport of a wide variety of media such as waste acids, mixed acids, chlorine bleaching lyes and rubber linings for pipes subject to high abrasive loads.

In Steuler's portfolio, clients can find the right system for every application.

REPAIR SYSTEMS

Even the best rubber lining can be damaged at some point.

Minor damage caused, for example, during the cleaning of vessels or the installation and removal of scaffolding or built-in parts can be quickly and easily repaired with the help of our repair mortars in order to maintain operations.

Depending on chemical and thermal load, these mortars can serve as a permanent repair or at least provide corrosion protection until the next scheduled period of downtime and repair with the original material. **AMR**

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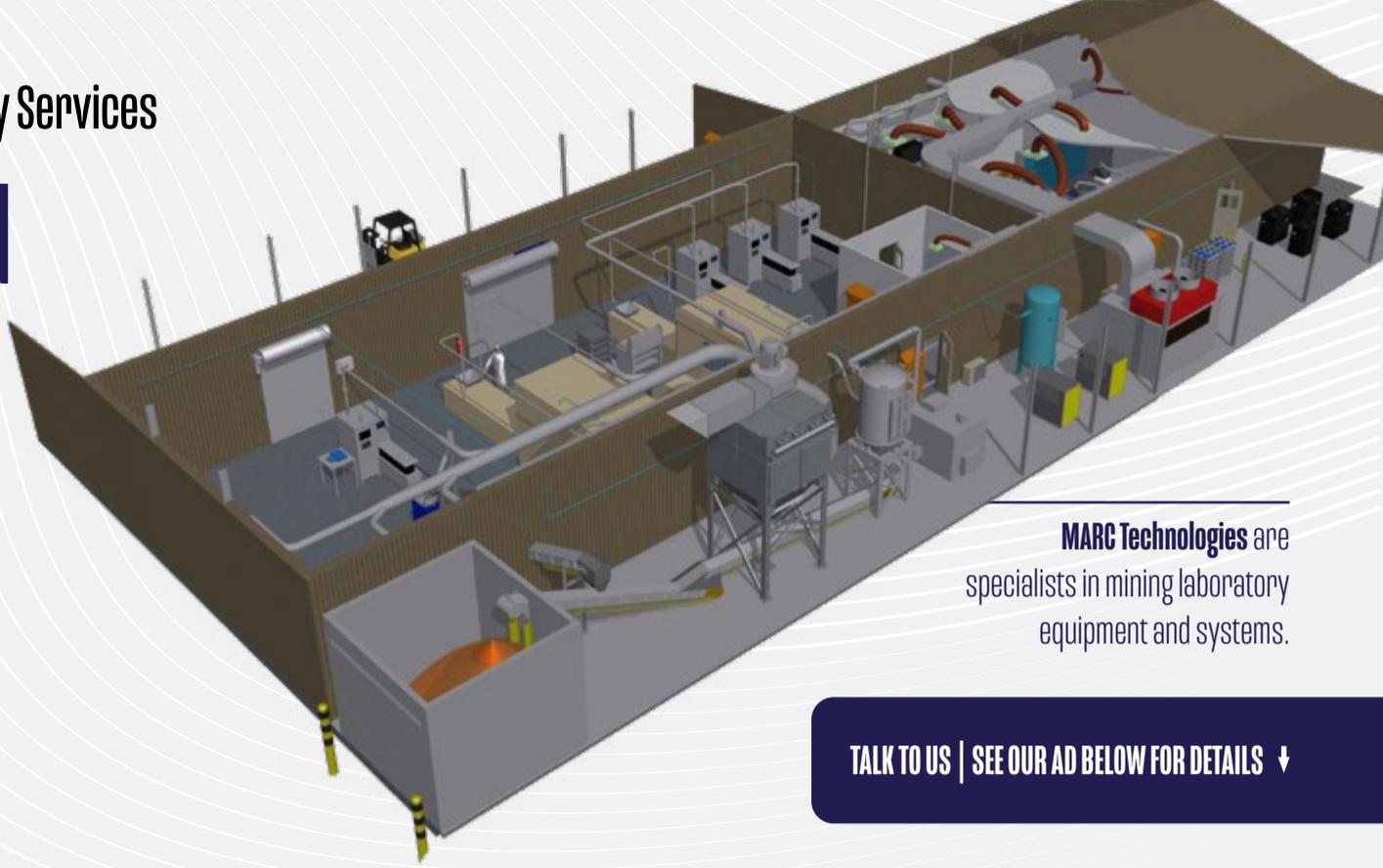
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- Airflow – 790 M3/hr
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The Obvious and Hidden Benefits of Good Laboratory Engineering



MARC Technologies are specialists in mining laboratory equipment and systems.

TALK TO US | SEE OUR AD BELOW FOR DETAILS ↓

MARC Technologies is a unique business specialising in the design and manufacture of mining laboratory equipment and systems.

These systems including extraction systems, HVAC, benching, air & gas reticulation and more.

Because of our vast experience with these many facets MARC has had a reputation as the “go-to guys” for a solution to mine site laboratory design needs.

We know what it takes to design these into your laboratory.

As not only a manufacturer but also a reseller of laboratory equipment, if we don't

manufacture it, we will know who can.

MARC has specifically chosen not to manufacture jaw crushers and ring mills which allows us to purchase from all the more reputable manufacturers.

As a result, we can select the most suited products available for use in your project.

Unfortunately, many equipment suppliers claim to be able to design a laboratory –it helps them increase their scope and sell more.

No qualifications or certifications are required to design a laboratory, but very few accept they are then responsible for the creation of a structure that may potential-

ly expose end-users to some of the most hazardous chemicals, gases and fumes used in industry.

The most frequently observed error is the lack of consideration of makeup air.

This shows a lack of real-world understanding of the risks involved in working with aggressive mineral acids and organic solvents during the design phase of the laboratory supply package.

There are also many engineering tricks we have learnt along the way that will reduce your lab's energy consumption, reduce capital costs, reduce maintenance costs and at the same time ensure you get a safe and efficient laboratory. **AMR**



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KLEN International specialises in the manufacture of fire assay flux and certified reference materials while also supplying consumables to mining and geochemical assay laboratory markets – and has done so since 1991.

KLEN International became part of the VWR/Avantor group of companies in late 2012. Avantor is a Fortune 500 global company based out of the USA and is a leading supplier of critical products to the world's top companies in the pharmaceutical, biotech, industrial, educational, governmental, and healthcare industries. Avantor provides their extensive clientele with an expansive choice of premier products, such as chemicals, laboratory furniture, equipment, instruments, apparel, and consumables from a vast and elite group of leading scientific manufacturers.

KLEN International (fully accredited under **ISO 9001** since 1994 & **ISO 17034** since 2018) based in Perth, Western Australia competes successfully with its international competitors and has become the premier manufacturer of fire assay flux having exported to more than 70 countries. KLEN International is the preferred supplier globally to the large commercial laboratory groups.

Contact **KLEN International** for further information, a quote, or any assistance with your general assay consumable requirements, via sales@klen.com.au or visit www.klen.com.au.

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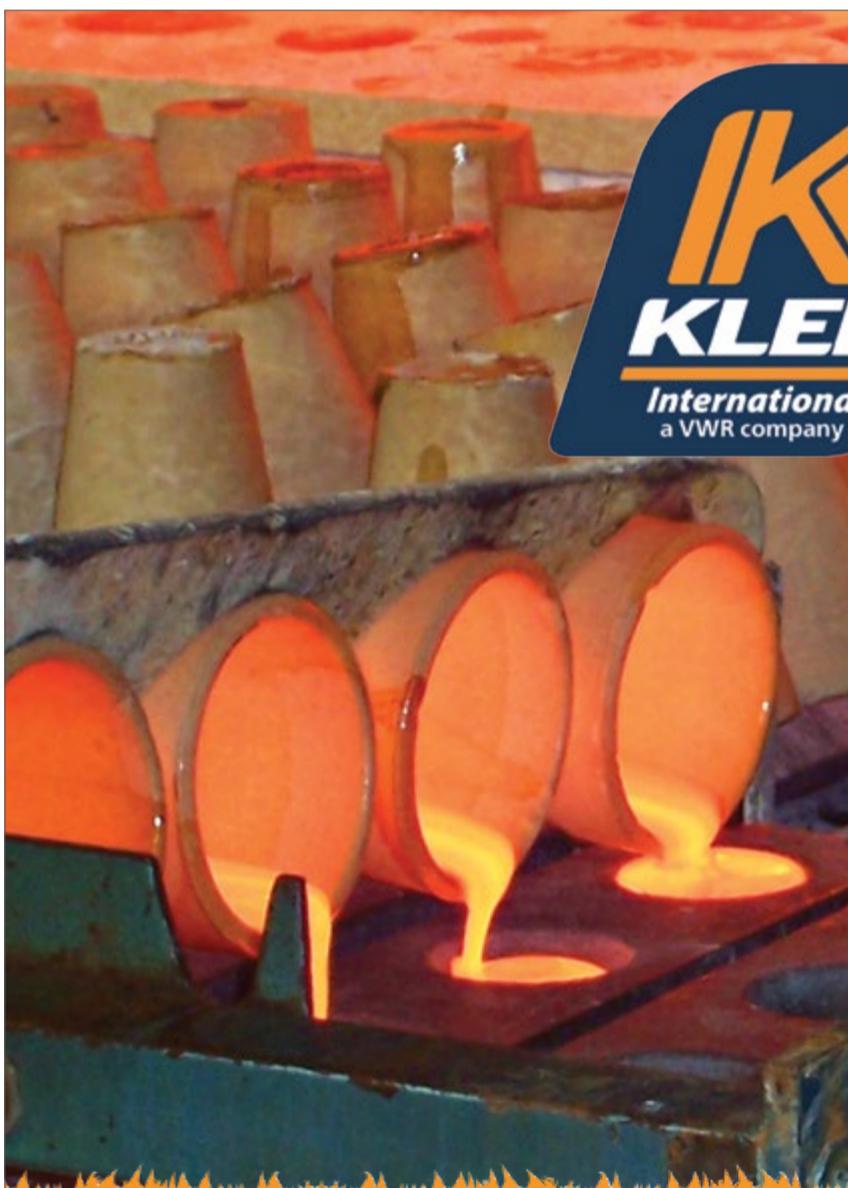
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Aussie's Raptor 500 Bar Hydro-blaster being tested before release.

AUSTRALIA'S MINING SECTOR... STEADY AS SHE GOES

*This story is contributed by
Australian Pump Industries.*

Their Chief Engineer John Hales, is a keen observer of the growth of the Australian Mining Industry, having seen the enormous benefit to the country delivered by this sector of the economy.

As we step back occasionally and take a good look at Mining we can't help but be impressed. The wealth of the country and the living standards of the population to a large extent, depend on the viability of Australia's most important economic resource.

Most people don't understand that the mining sector contributes around 13.4% of total GDP and makes up more than 2/3 of Australia's merchandise exports. It employs around 300,000 people.

Iron Ore is the star performer. LNG, metallurgical coal, base metals and gold also play a major part.

CURRENT OVERVIEW

The influence of global energy transitions,

geopolitics and infrastructure development are changing demand with increases for some commodities while others are in decline. Commodity prices and earnings are expected to ease over the outlook period. (the above attributed to the March Resources and Energy Quarterly report).

Supply disruptions for energy commodities have reduced, but new risks are being introduced with Geopolitical conflicts (Resources and Energy Quarterly).

It's not all bad news.

One thing we are finding is that there is major investment currently underway in Australia, locating new deposits and developing new mines.

On the other hand, higher than normal odds of a new La Nina in late 2024 could raise the risk of wet weather and flooding. That could heavily impact mines, transport routes and ports in Australia.

IRON ORE

Australia is currently producing 57% of the World's iron ore, we know that there are competitors out there.

Brazil now accounts for 23% and there are emerging producers in Africa who will undoubtedly be chasing business from the world's biggest iron ore consumers.

India will emerge as a bigger customer for not only Australia but our competitors as well.

CHALLENGES AHEAD

It seems the biggest challenge of all is the ability of our mining industry to stay competitive with emerging alternate sources.

It is delightful to read that Australia has the largest known global share of gold deposits at 22%.

What is not so exciting is the fact that we are No. 3 as exporters of gold, with both

United States and Canada ahead of us.

EXPLORATION..... LET'S GET DRILLING

Bearing in mind that extracted minerals don't automatically renew themselves, it's great to see Australia's drillers hard at work all over the country.

Here at Aussie Pumps, we support them with a wide range of products.

For those mines involved in big extraction programs, our big 6" trash pumps are ideal for flood mitigation.

These big 80hp diesel driven pumps can be either skid or heavy duty site trailer mounted.

MUD PUMPS

Since we started working with the exploration drilling industry we've learnt a lot about what makes a great Mud Pump.

"We've had some real lessons from a

practical sense that show us how we can help the industry be more efficient and of course minimise downtime," said Hales

The Aussie Mud Pump range start from standard 2" hydraulic drive pumps with 316 stainless steel impellers and tungsten carbide seals. Bigger machines in 3" and 4", that will handle up to 2,200 lpm, are becoming more popular as drillers recognise that overworking smaller pumps may not be a practical solution for this vital process.

The bigger pumps are now being built in volume to suit Australian Drillers requirements.

"We're finding water well drillers and even horizontal drilling contractors using the same equipment and going through the same process of finding that "Big is Beautiful", said Hales.

AUSSIE BOOSTS MINE BOSS PRODUCTION

One of the big successes the company has been their Aussie Mine Boss range. This range includes self priming centrifugal trash pumps, that go from 2", 3", 4" and then 6". These Mine Boss pumps offer a wide range of flows and heads suitable for most applications.

The 2" Mine Boss pump has a stainless steel frame with integrated lifting bar, is powered by a 4.8hp electric start Yanmar air cooled diesel engine, and produces around 600 lpm.

The range goes from there right through to the big pumps with flows of up to 6000 lpm and proportionately bigger horsepower drives.

"By that we mean that we have pumps that can dewater a puddle or lake, depending on the site requirements," said Hales.

The Trash Pumps all have front opening ports to make it easy to clear out a choke. Impellers are big open non-clog style with silicon carbide or tungsten carbide seals depending on the model.

"The whole purpose of the Mine Boss range was to build machines, both pumps and pressure cleaners, that will go the distance in the rigours of the mining industry," said Hales

The customers who've used them, love them because they appear to be unbreakable and are built to go the distance.

Its amazing to see these machines last, resisting the abuse and poor maintenance often found in the field.

AUSSIE EXTREME 500 BAR, A CASE STUDY

15 years ago, DJW Contracting bought an Aussie Raptor Extreme 500 bar Hydro-blaster. It features a super heavy duty frame which allows fork tine entrance from all sides and has an integrated bunding tray.

The 500 bar Mine Boss Extreme is powered by Yanmar TNV water cooled multi cylinder diesel engine with a 50L fuel tank that allows up to 8 hours of running time. It includes an integrated control panel, full engine protection and hour meter.

The 7,200 psi pressure is delivered from a Big Berty Bertolini heavy duty RA series triplex pump with a stainless steel head and 4 year warranty.

The big machine also includes a 60L break tank in stainless steel, e-stop, fire



Operators completing Aussie's Safe Operator Training Program.

extinguisher, dual pole battery isolator and a high vis Class A reflective frame marking. A flashing safety beacon is also standard as well as double insulated wiring.

With the Mine Boss Extreme 500 bar machines Aussie went all the way to develop a machine that has higher specifications than any other machine on the market. DJW bought their first Extreme 15 years ago and only returned it to Aussie Pumps for its first service in March this year.

The machine was serviced and delivered back to site in a matter of days with the customer purchasing a second machine for duty at the same site in April 2024.

DJW Contracting managing director Darren Wells says, "The machine is built so strong and I know it won't let me down, these machines are really capable of doing the job!"

MOBILE CLEANING OPTIONS

For applications requiring a trolley mounted unit, the Aussie Atlas is a stainless steel framed machine with big steel wheels with pneumatic tyres make it easy to move around.

A Big Berty triplex pump delivers 4,000 psi pressure and 15 lpm flows. The pressure washer is fitted with a stainless steel reel with 30 metres of Aussie high pressure hose, giving extended reach of up to 60 metres.

The machine comes with Aussie's free ASP safety protection kit as well as detergent injection, e-stop, fire extinguisher, dry cell battery with lockable battery isolation, double insulated wire and an integrated lifting bar for easy movement on site.

MORE MINE BOSS IDEAS

Electric Drive Model

The success of the Mine Boss range drove us to apply the same principles to our heavy duty electric drive pressure cleaners as well.

The result was the new 5000 psi Mine Boss Hurricane, built on a heavy duty 4 pole 3 phase IP 55 rated slow speed motor.

"We're designing these machines to last in the toughest applications. We've come up with an electric drive pressure cleaner that is robust, reliable and safe," said Hales.

Hales went on to say, "the heavy duty IP56 rated on/off switch comes with motor protection; a circuit breaker and thermal trip included as part of the control system. Designing equipment that is guaranteed to give the users the very best outcome is



Aussie's Mine Boss Hurricane ready for a life at the mines.

what it is all about for us."

Our slogan is "we design and build machines as if we were going to use them ourselves!"

AUSSIE'S FREE SAFETY OPERATOR TRAINING COURSE

As Australia's leading designer and manufacturer of high pressure cleaning equipment with a focus on construction and mining. We know a strong attitude to safety is vital.

We spoke to many operators that couldn't do expensive courses that took them away from work for one or two days.

We set out to create a training course that would first of all be free. It was designed to keep customers informed and safe.

We called it "Aussie Safe Operator Training Program". Every day we get lots of notifications of completion, from customers not just from Australia but from all over the world.

Operators like the course because they can see the benefits. It explains triplex pumps technology, promotes safety awareness and basic maintenance. The operator needs to understand how the machine works to be able use it safely.

Comments we get from successful

candidates include "this course is excellent!" or "I learnt a lot about maintenance and operation of the machine."

Keep them coming, the course is free. Anybody using pressure cleaners in a mining, quarry site should do a safety training course. It is on our website under Aussie's Training Academy.

High pressure water blasters can be dangerous if used in an inappropriate or careless manner.

"Our advice.... do the course.... Get Home Safe!"

For further information please contact Aussie Pumps on (02) 8865 3500 or www.aussiepumps.com.au or send us an email with your enquiry to info@aussiepumps.com.au

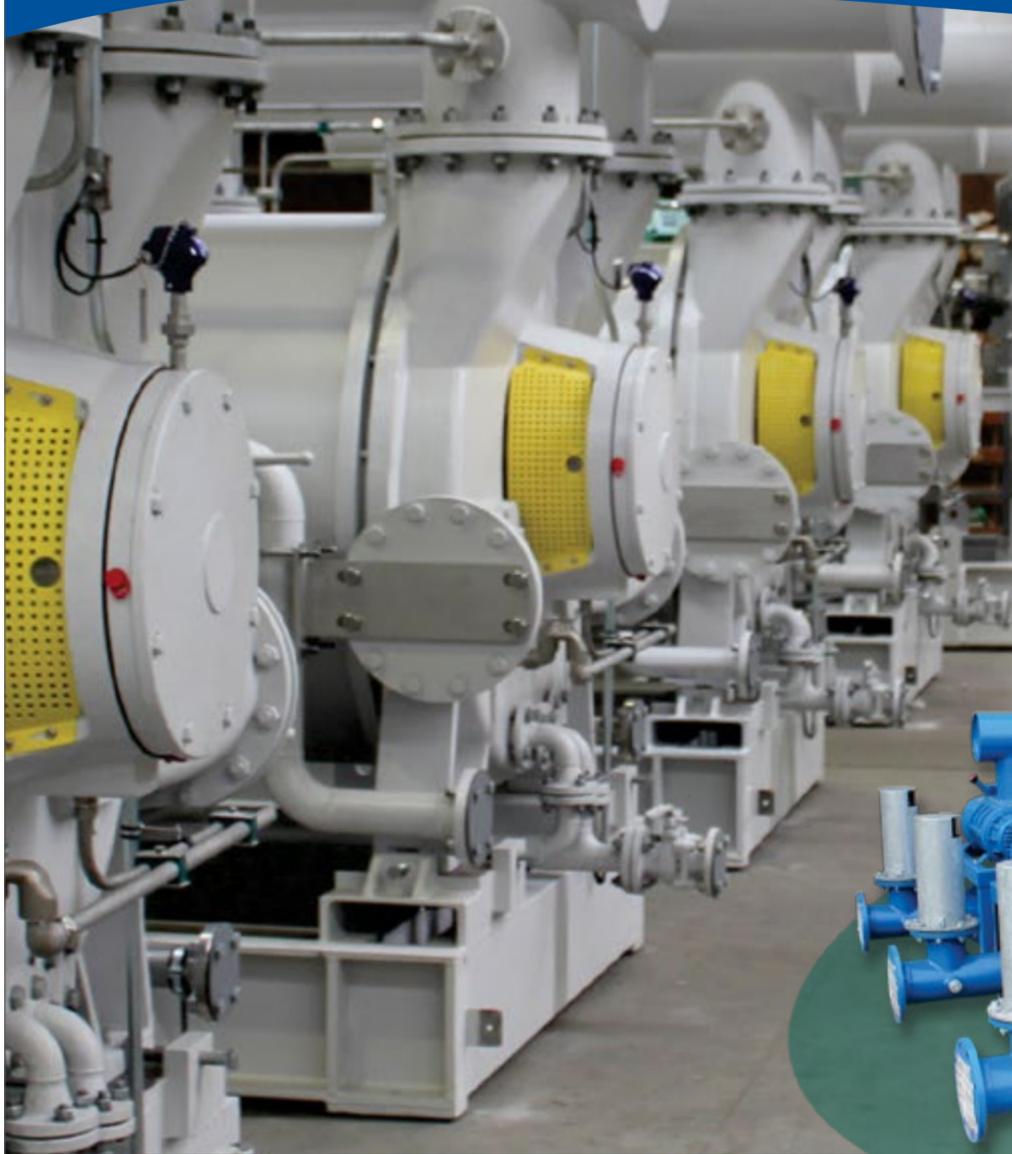


SCAN HERE FOR MORE INFO ON AUSSIE'S SAFE OPERATOR TRAINING PROGRAM



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Choose from a range of products available with varying sizes and load capacities:

- The R1 has a basket size of 895mm, an internal height of 550mm and a weight range of 450kg.
- The R3 has a basket size of 1100mm and 1400mm, an internal height of 600mm and a weight range of 750kg.
- The R4 has a basket size of 1500mm, an internal height of 900mm and a weight range of 1500kg.
- The R5 Robowash machine has a 1800mm basket, an internal height of 1100mm and a weight range of 3000kg.
- The R6 Robowash has a basket size of 2000mm, an internal height of 2000mm and a weight range of 4000kg.
- The R7 Robowash has a basket size of 2400mm, an internal height of 1500mm and a weight range of 6000kg.



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SPECIALISTS IN RAIL & CIVIL INDUSTRY

100% INDIGENOUS OWNED BUSINESS



Paula White
PMW Industries Managing Director

PMW Industries is a recognised Banjima Traditional Owner business, 100% owned and operated by Banjima Traditional Owner Paula Marie White.

We operate in the Pilbara region of Western Australia as a contracting company specialising in providing the highest quality of mining, civil and earthmoving services. Our team has more than 20 years of experience within the rail and civil industry, with a willingness to provide innovative solutions to create cost and time savings for our clients.

At PMW Industries, we pride ourselves on producing the best quality of work, with attention to detail, in a safe and productive environment thanks to our proven site management team and experienced work force who are dedicated to providing and maintaining strong, mutually beneficial working relationships between Traditional Owners and major mining, resources and supply companies across WA.

It is within our vision to provide long-term, meaningful employment, training and relationships.

Our culture at PMW Industries is shaped to support the needs of the diverse mining and resources sector of WA, and are 100% committed to investing in a rich workforce that upholds the right skills and a thriving workplace culture.

When working for PMW Industries, you are working with a quality service provider in the mining and resources sector that is renowned for delivering superior workman-

ship to our clients, while also providing meaningful employment opportunities for Aboriginal people.

We take pride in forming and managing ongoing strategic alliances and operating a highly skilled and professional team who are dedicated to getting the job completed.

No matter what the industry is, it takes a hardworking team to make the mission and vision happen. PMW Industries is incredibly fortunate to have a skilled set of staff with a diverse range of capabilities. Our team is committed to delivering results, founded on the ethos of client satisfaction.

OUR HISTORY

Paula White – Managing Director

Paula White is the Managing Director of PMW Industries and is one of the founders of White Springs. She is a Banjima Traditional Owner, and her cultural heritage was always instilled in her from a young age. Paula was raised by her grandparents; her grandfather was one of the stolen generation who was born in White Springs prior to being removed and placed in Roelands Mission.

At the Mission he was given the surname White from his known place of birth. When Paula was 12, they travelled to the Pilbara where her grandfather was reunited with family and reconnected with his country. It was from her upbringing that the concept of connection and paying respect to her heritage was founded.

Paula has spent her entire career working in the community engagement sector.

She worked for almost a decade in the WA Police Force and then moved on from there, serving another eight years at the WA Department of Justice. Paula went on to work with the Gumala Aboriginal Corporation, supporting the education, employment, and livelihoods of Banjima, Niyaparli and Innawonga Traditional Owners and their children.

Strongly recognised within the Banjima community, Paula has held positions within the Banjima Charitable Trust and Direct Benefits Trust as the current BNTAC (Banjima Native Title Aboriginal Corporation) chairperson and counsel member, and was incredibly instrumental in advising on creating polices for beneficiaries with outcomes that delivered health, education, employment, wealth creation and capacity building, with the view to utilise royalty income to progress housing outcomes so beneficiaries see tangible benefits.

Paula is also the Director of White Springs Demolition & Asbestos which successfully completed the asbestos remediation works on the Tom Price Karratha Road for Main Roads WA on the Red Dog Highway.

With Paula's leadership, PMW Industries has secured 2 large contracts with BHP for the operation and maintenance of an Ore Handling Plant (OHP) at Area C for 5 years as well as a 5-year contract with Geoscience Project to provide civil services to BHP.

JOINT VENTURE WITH CSI

More recently, PMW Industries established a JV with CSI, a subsidiary of Mineral

Resources, backed by more than 2 years working collaboratively at delivering crushing services at Area C OHP4 and rehabilitation services throughout the Pilbara. The PMW Industries-CSI JV will be majority owned by PMW Industries at 51% shareholding, with the remaining 49% ownership held by CSI. This initiative was driven by Paula White and Mike Grey.

The function of the JV entity will be to allocate works through a subcontract mechanism where each party is accountable for delivering its respective scopes to ensure that PMW Industries continues to grow capability and capacity in its own right as a 100% owned and operated Pilbara Aboriginal Business (PAB). The PMW Industries-CSI JV has been established on core principles of partnership and sustainable growth, with the objective of the JV to achieve sustainable capacity building of PMW Industries.

In addition to providing labour and machinery to the JV scopes, we are a genuine Banjima Traditional Owner business that brings cultural and heritage awareness, Indigenous personnel and capacity building to meet the objective for the contract.

On this basis, the PMW Industries-CSI JV has been structured to allocate discrete work scopes to each JV party through a subcontracting mechanism, ensuring that PMWI continues to grow capability and capacity in its own right as a 100% owned and operated Indigenous business. **AMR**

For more information visit
www.pmwi.com.au



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Supplying machinery and a highly experienced team of operators for shut downs & projects



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At work with the new portable MinarcMig 220 Auto.

The right welding tools can help mining operations experience increased efficiency and productivity as well as quality welds.

Kemppi is a pioneer, global designer and manufacturer of intelligent welding equipment and welding management software. Our solutions empower professional welders to help boost productivity and quality.

To this end, Kemppi recently launched the MinarcMig 190 and 220 Auto welding machines which are ideal for the professional welder working around the mine site and/or in the mine's maintenance workshop.

Portable and powerful performance with the MinarcMig Auto range

Delivering precise, quality welds, they provide portable MIG/MAG welding power, offering 190 amps at a 35% duty cycle or 220 amps at a 20% duty cycle from a 15 A, 1-phase power supply.

The machines are lightweight so that welders can carry them anywhere around the mine site, and their compact size makes it easier for them to quickly access and complete welding tasks.

Both models are also very easy to set up and operate to help boost productivity. Plus, the welder can choose the Auto setting to further simplify the welding process.

Compatible with various materials including steel, stainless steel, aluminium and CuSi brazing filler wires, the welder can do more with one machine. And both models also feature an adaptive arc regulation system to ensure precise welding quality and accurate ignition. These help to minimise spatter and create high-quality welds. The need for post weld cleaning is reduced, saving time and money.

Energy efficient, both Auto packages

also come with a 3-metre Flexlite GC 223G welding torch, which has an ergonomic shaped gun handle and flexible cable. Better still, both machines can be used with long power extension cables of up to 100 metres for optimum welding utility on mine sites.

Kemppi WeldEye keeps you in control

Apart from world-class welding machines, Kemppi also offers WeldEye software solutions which optimise welding production on mine sites.

WeldEye lets mining management retain control of all the processes in welding including welding procedures, traceability of welds, quality of welds, as well as welder and inspector qualifications, document-

tation and reporting. If any welding deviations occur, management is notified for real-time rectification.

This data-driven approach lets management analyse welding data and ensures quality control for improved working efficiency and excellent welding performance on mine sites. **AMR**

For more information about Kemppi solutions call Kemppi Australia on (02) 8785 2000 or email sales.au@kemppi.com

BOOST YOUR WELDING PRODUCTIVITY AND THE QUALITY OF YOUR WELDS WITH **KEMPPI**



Snapshot of WeldEye.

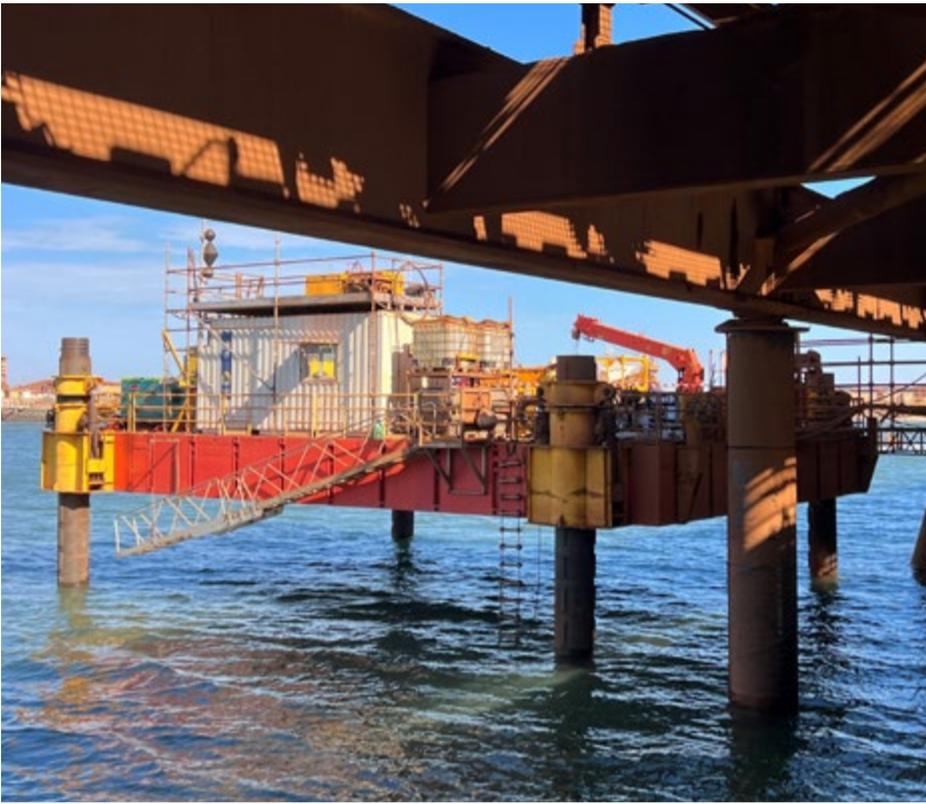
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MINE MAINTENANCE SERVICES

In recent years Australian Barge Hire (ABH) has supported the maintenance and refurbishment of various critical overwater infrastructure. ABH's jack up barges are used to provide a stable over-water platform for the refurbishment contractor to setup up project equipment such as specialist blast and paint facilities, blast garnet and waste collection, wash down facilities and general site amenities on the barge.

can be elevated to be at a similar height as the structure (wharf or bridge) being refurbished. The stable elevated platform (not subject to tide movement, waves and current) allows simple personnel access on and off the structure using walkways. These walkways can also be designed to provide an easy solution for running multiple blast and return lines. Once the span is completed the lines and walkways are disconnected from the structure and the barge jacked down and moved along to the next work face.



The ABH jack up barges (JUB's) are typically positioned between two spans and progressively moved along the structure as works progress. ABH workboats support the JUB and ferry blast garnet and paint from shore out to the Jack up barge and back load returning waste material to shore. These critical items are lifted on and off the jack up barge using the deck crane which comes standard on ABH barges.

For more information or to request a quote, visit www.australianbargehire.com or call 02 9531 2900.



As illustrated by the photo above, if the water depth permits, the jack up barge

SUPPORTING CRITICAL OVERWATER INFRASTRUCTURE

Access over water operations with ease with Australian Barge Hire's jack up barges. These barges can be elevated out of the water above waves and tidal movements, providing a safe and stable working platform.

They are used to provide a stable platform for:

- Waste collection • Wash down facilities • Paint facilities • General site amenities

Contact:

info@australianbargehire.com

02 9531 2900

www.australianbargehire.com



SPECIALISTS IN LINE BORING & MACHINING

Since 2002, locally-owned and operated NLC Engineering has been specialising in Line Boring, General and CNC Machining and Engineering with a skilled team of fully qualified technicians who are dedicated to working effectively.

In that time, we've seen our business go from strength to strength, and earned a well-deserved reputation as the local leader in mobile line boring and related on-site machining services.

As a trusted name in the industry, NLC Engineering remains committed to providing excellence in engineering solutions. We make it our mission to work efficiently with a genuine commitment in providing the best possible service to each and every one of our clients.

SERVICES

Line Boring: With more than 20 years of industry experience, we provide genuine excellence in all line boring tasks. As a highly specialised undertaking, it can be incredibly time-consuming if you need to dismantle your machinery for transportation to a workshop. This is why we remain onsite as much as we possibly can throughout the duration of a project, saving you both time and money. We can also carry out line boring in our state-of-the-art workshop, where we're constantly developing and improving equipment for the tasks required.

General Machining: At NLC Engineering we use only the highest quality raw materials and make sure we always have the right people on hand for superior service and support.

MORE SERVICES:

- Mobile Line Boring
- CNC Machining
- General Machining
- Mobile Milling
- Engineering
- Reverse Engineering
- Boilermaker and Fabrication Works
- Field Service

At NLC Engineering, our specialty has been focused on providing superior service and support to our customers, and our personnel are continually recognised as being top notch for their personal excellence and their dedication to our customers.

With more than 6 mobile line boring units and our new mobile milling unit, we are now the largest mobile line boring and milling company in the Goldfields, and we pride ourselves on providing quality products, friendly service and fast turnaround times to clients throughout the state.

For More Information
www.nlcengineering.com.au

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NLC

ENGINEERING

THE LINE BORING & MACHINING SPECIALISTS

ABOUT US

- ✓ EXTENSIVE EXPERIENCE
- ✓ COMPREHENSIVE SERVICES
- ✓ DUAL TRADE QUALIFICATIONS
- ✓ PROFESSIONAL & SKILLED TEAM
- ✓ QUALITY PRODUCTS
- ✓ FAST TURNAROUND

OUR SERVICES

- ✓ LINE BORING
- ✓ CNC MACHINING
- ✓ MANUAL MACHINING
- ✓ MOBILE MILLING
- ✓ ENGINEERING



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SERVICING THE GOLDFIELDS & PILBARA REGIONS SINCE 2002



1st stage
big particles are retained on the top of the filter

2nd stage
small particles are trapped in the mid stage of the filter element

3rd stage
the smallest particles are trapped in the lower and compressed part of the filter.



PERFECTLY CLEAN OIL

Triple R Filtration Australia is the leading provider of Triple R Filters and Tan-Delta oil condition sensors in the Australian market.



High efficiency output of modern machines has resulted in the increased demands of **Clean Oil** in them, which has also created new challenges for oil blenders and filtration companies. Modern machines have components that are made with high precision and require better lubrication properties to ensure that they can consistently function with high standards without fail. Better filtration products, systems and methods have been derived over the years to cater to these needs.

However, not all filtration products and methodologies are made the same. The selection of materials, the design of the element and even the installation location of the filter play a huge part in the effectiveness of cleaning the oil. Of course, there are also other factors that need to be considered when selecting a filtration product: the cost, the change-out rate, the environmental impact, etc. To increase the **Reliability** of a modern machine can be as simple as selecting the right filtration product!

Perfectly Clean Oil is not a myth but more of the method on how to achieve.

Inline and Offline Filtration

(Full flow and by-pass filtration)
Filters can normally be found installed inline on modern machines, such as the engine filter (full flow) or pressure/ return filters in a hydraulic system. These types of filters are normally used as the "last chance" protection before the oil flows to the critical components in a machine.

These filters are generally costly to make due to the use of them in pressurized lines.

On the other hand, offline (by-pass) filters can also be found in modern machines, as an addition to the full flow filter. Flow of oil is directed (or drawn out) from the main oil supply into the offline filter to enhance the filtration capability. Filter media used in by-pass filters are specifically designed to capture small particles which the full flow filter cannot. These filters are generally cheaper to make compared to inline filters.

To achieve **Perfectly Clean Oil** in a system, the use of offline (by-pass) filter is a must. The ability to effectively clean the oil down to 2µm particle size will ensure the oil is clean in the supply to the main system, hence significantly reduce the stress on the inline filters.

Triple R Filters

Triple R filter elements have unique features which make the element perfect for offline (by-pass) filters used in machines. No other filter element on market displays such features.

1. Oil enters the filter media in a radial direction. This ensures that oil is directed into the thick 114mm of depth media.
2. A 1st stage of filtration ensures that large particles are trapped in the least compressed filter media. By doing this, element lifetime is extended.

3. In the 2nd stage, the filter media, which is now more compressed ensures that smaller particles are being filtered out of the oil. This again ensure maximum filter lifetime.
4. In the 3rd stage of filtration, the filter media is compressed at maximum by means of the outer wrap, which traps all small particles in the oil.

The filter element has a very large volume of cellulose filter media contained within. This volume of area of media ensures that the element is effective at removing contamination as well as ensuring extended lifetime of the element hence reducing the change-out interval, **Reducing The Cost.**

Oil Condition Monitoring on System

To increase reliability of modern machines, electronic sensors have been introduced to constantly provide real-time information on the conditions of the machines to the user. New technologies have also been developed in monitoring the condition of oil in machines. These technologies are used to provide continuous real-time on-line oil conditions to users, to reduce the risk of infrequent oil sampling and gives the user transparent information on the oil to make more informed decisions on oil change-outs.

Tan-Delta

Triple R Filtration Australia is proud to represent Tan-Delta oil condition sensors in the Australian market. The Tan-Delta sensor outputs the condition of the oil as an easy to understand value, measuring

the remaining useful life of the oil in the machines.

Features

- Analyses the electro-chemical properties of oil with unrivalled accuracy
- Measuring the remaining useful life of the oil in the machines
- This accuracy allows the sensor to also measure other contamination in the oil such as oil dilution, wear metals and water in oil
- Easy to understand output values
- The sensor outputs the rate of change of the oil, which is useful to indicate the rate of oil degradation
- Plug and play solution for logging and retrieving data
- Data communicated to a Cloud based platform if required

The sensor can also be packaged into a mobile kit allowing it to be used to measure condition of the oil on multiple compartments without the need of permanent installs. **AMR**



Contact us to find out more
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Triple R

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ENGINEERING OPTIMAL SOLUTIONS

Triple R Filtration products specialise in the removal of water, varnish, sludges, and particles in lube, hydraulic, engine oil, heat transfer fluid and diesel fuel. The products are engineered in Australia catering to the local industry demands.

Product Applications include:

- Lubrication oil systems for compressors & gearboxes
- Hydraulic systems
- Diesel & gas driven engines
- Heat transfer fluids
- Bulk diesel filtration

Our Solutions for your industry:

- Tailored oil impurity control advisory
- Depth cleaning filters
- Filter systems mobile & stationary
- Custom engineered systems
- Real time oil sampling & analysis
- Oil cleaning services: varnish & water removal
- Rental & hire fleet

DRIVE YOUR PRODUCTION UP AND COSTS DOWN!

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Loadrite L2180 systems for MRL, MLG Kalgoorlie Gold Mine.

SMARTTECH DOMINATING AUSTRALIA'S CIVIL AND MINING SECTORS



Sales Manager Craig Foster.

Beginning with just four employees in 2017, SmartTech has grown substantially to provide its services all over the country. Servicing Australia's civil and mining sectors, SmartTech's personnel possess the vast experience to call on the industrial sector.

Sales manager Craig Foster spoke of SmartTech's growth and its presence in the country.

"We've got a very large support fleet of equipment and personnel. WA is the largest branch as far as support capability. In WA we've got nine trained technicians, four service trucks which are prime movers and two more on order," he said.

"Nationally, we have 17 service trucks across 13 locations.

"In WA, we have a base where we store trucks and vehicles and equipment, this is in the Goldfields and in the Pilbara as well as Perth."

Remote Work

Servicing mining companies all over Aus-

tralia, SmartTech is no stranger working in remote areas.

"We have mining companies on the WA — South Australia border, same with the Northern Territory — WA border and all the way down to Esperance and everywhere in between," Craig said.

"It's a big state and a big struggle, but that's why we've got so much equipment and so many people.

"With the more remote sites, the guys are very isolated because you're really only going there for them. We do our best to dedicate some special time for them each year on recalibrations and stuff."

Loadrite

A scale system for client's assets, Loadrite scales are the highest quality on-board weighing system in the market. It dramatically increases production, improves accuracy and lowers operating costs.

Loadrite has been around since the inception of SmartTech and is a core pillar of the company.

All scales need to be recalibrated and SmartTech schedules over 1000 recalibrations per year, in WA alone.

"Basically, it [Loadrite] gives them productivity and visibility. We combine it with software, we've got numerous software that they can utilise," Craig said.

"They [the clients] use it for both safety reasons and for productivity reasons. They can get a clear weight of what the equipment is picking up."

Loadrite scales can be added to a range of machines, including excavators, haul trucks, loaders, conveyor belts, tractors and f-lifts.

With the Loadrite Material Management

System (MMS) installed on your computer, you can turn the Loadrite onboard scale into a business management tool. The recorded information can be used for inventory management, product tracking and identifying bottlenecks in the operation.

Improve your waste operation and report accurate information with the Trimble LOADRITE E2750 weighing system that gives you the information to increase efficiency and maximise profits.

By tracking the weight of each bin, customers receive accurate weights which helps their environmental reporting and helps reduce their carbon footprint by increasing their recycling rate. For over 20 years, metal mining services company MLG Oz has been using Loadrite with over 100 loaders all running on the Loadrite system.

"MLG have been using the Loadrite system for over 20 years and find it a very reliable and accurate weighing system," managing director Murray Leahy said.

"The Loadrite system is a very accurate and reliable system, the backup support provided by SmartTech has been excellent.

"MLG look forward to dealing with SmartTech into the future."

Growth

With a plethora of solutions, SmartTech will start promoting these to market a bit more now.

"We've got a large safety suite, which is one of the areas that is obviously getting a lot of news at the moment," Craig said.

"It's good to show the market what we've got to make sure they're covering all their statutory requirements in the safety field."

For more information on Loadrite, visit www.smarttechaustralia.com.au

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MLG Oz WA- Loadrite.



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Exactly What You Need

When You Need It

Field Machine Tools is Australia's largest stockist of specialist onsite machining and portable maintenance equipment.

We offer for hire and sale one of the most comprehensive ranges of portable equipment suitable for a large range of applications, materials and specifications.

FMT is a dry hire only company - we never compete against our customers for on-site service work - with conveniently located branches in Queensland, Victoria and Perth.

Maximising equipment up-time is critical to shortening project completion times and increasing bottom line profits.

Removing equipment from the job site to a repair facility can delay project completion and put a damper on profits.

This is where Field Machine Tools can help. FMT has the on-site repair and maintenance machines that will minimise maintenance times and keep equipment working for companies and their customers.

Keeping equipment and plants in top operating condition is a constant challenge for today's mining, oil, gas and power generation contractors.

Our wide range of portable equipment

is available for rent or purchase, Australia-wide from our three branches, and include equipment for machining applications such as Portable Milling Machines, Portable Lathes, Clamshell Pipe Lathes, Flange Facers (OD and ID mount), Line Boring Machines, Vessel Grinding Machines and Pneumatic Magnetic Based Drills.

For welding applications, there are Bore Welding & Cladding Machines and Induction Heat Treatment Equipment.

For valves, there are Valve Test Equipment, Valve Repair Equipment and Portable Valve Actuators and, for heat exchanger, condenser and boiler manufacture, repair and maintenance there are Tube Pulling Systems, Tube Cleaning Systems, Heat Exchanger Tools, Torque Controlled Rolling Motors and Australia's largest stock range of Tube Expanders and consumables.

FMT is the Australian agent for major international brands including:

Climax Portable Machine Tools, an impressive range of highly-sought after industrial equipment designed by a market leading manufacturer for the rugged challenges facing Oil, Gas, Mining, Chemical & Power Generation Industries.

CLIMAX pioneered the portable machining revolution in 1966.

For more than 50 years they have been the innovators and technology leaders in the industry they invented.

They're #1 for a reason!

Modec Motors and Portable Valve Actuators and Modec vane air motors have been used for 30 years as an alternative to traditional electrical motors in many demanding applications.

They supply OEM replacement motors to a wide variety of industries and application-specific motors to customer specification.

This includes a versatile range of Portable Valve Actuators for preventative maintenance of valves, even in the most demanding of environments, and incorporates a reaction device designed to reduce the risk of strain injury to the operator.

Krais Tube & Pipe Tools has been delivering top quality tube tools for over 40 years.

Designed and manufactured by their engineers, the whole process from paper sketch to producing the tools is controlled in-house with one of the biggest and most modern machinery and production line in the EU.

There is a comprehensive range of Condenser, Boiler Tube Expanders, Tube Roll-

ing Motors, Tube Installation Tools, Tube Cutting and Removal Tools, Tube Pulling equipment and Accessories.

Goodway Technologies is a USA-based manufacturer of specialised industrial maintenance products for HVAC, Energy, Manufacturing, Food and Beverage Production markets.

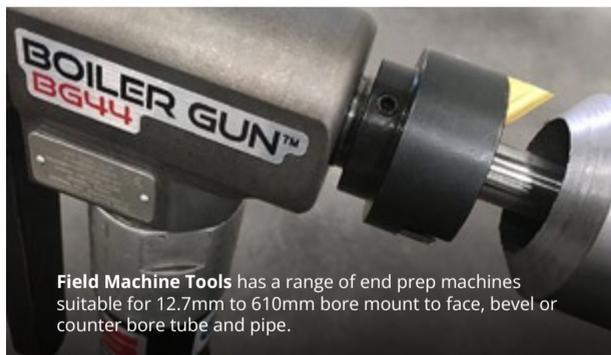
Since 1966, facilities and plant maintenance personal have used their innovative products to maintain HVAC systems, plant machinery, hazardous material clean-up, surface cleaning and other critical maintenance needs.

Established in 1995, Field Machine Tools (FMT) is a privately owned Australian company that provides engineering solutions for field applications to minimise downtime.

The scope of operations is to provide the most complete product lines available to OEM equipment manufacturers, maintenance providers, field service companies, power stations, petro chemical plants, mining industry and other related industries.

Call Field Machine Tools on **1300 FMT FMT** (1300 368 368), email **sales@fmt.com.au**

or visit **www.fmt.com.au** for more information. **AMR**



Field Machine Tools has a range of end prep machines suitable for 12.7mm to 610mm bore mount to face, bevel or counter bore tube and pipe.



Field Machine Tools has rugged and innovative portable flange facers for 19.1mm to 5054mm (0.75 to 199 inch) diameters. Several of the machines can be configured for facing, milling or both.



Field Machine Tools has OD mount flange facers suitable for 0mm to 3050mm (0 to 120 inch) diameters. Several models can handle flat face, raised face, RTJ, tongue and groove, lens ring, Grayloc and compact flanges.



Field Machine Tools has a range of Clamshell Lathes suitable from 33mm to 1676mm OD pipe preparation whether severing, bevelling or counter boring.

Powering Australian Pipelines



Caman Engineering is strengthening industry supply chains with solar-powered manufacturing – a move that has put a welcome green spin on flange production.

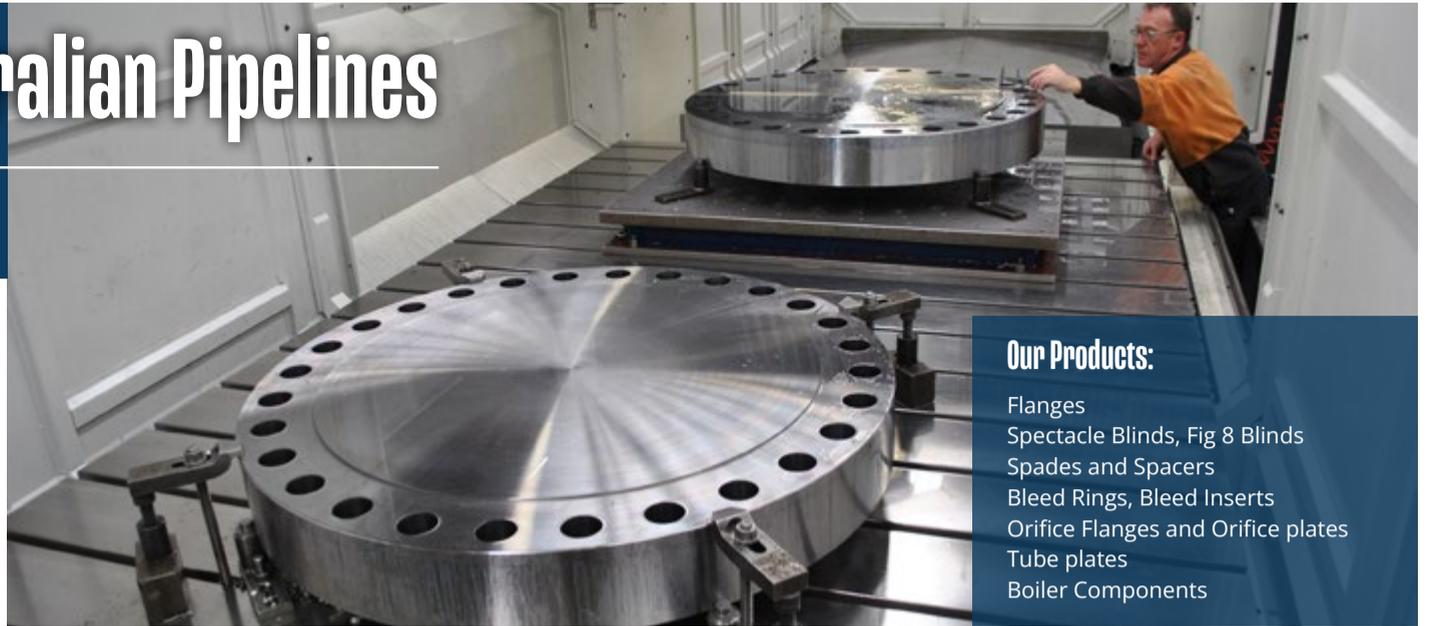
Following 70 years' of service, the Australian-owned company has pivoted to a sustainable production solution that accommodates the increasing number of operators prioritising environmentally friendly mine sites and suppliers.

The family business' in Sydney and Perth now has 100kw solar systems installed to power flange-manufacturing machines in its factories, which supports a variety of oil, gas, mining and petrochemical companies throughout Australia.

Caman Engineering Director Mark Cavanagh said the company boasted the nation's **largest independent stockist of flanges** and had become a mainstay in the mineral resources sector for its durable and well-designed products.

Mark explained the flanges were manufactured to various standards to meet process conditions, but the company was more than capable of supporting clients with unique or complex requirements.

"If a specific engineering requirement dictates the need for special material or



Our Products:

- Flanges
- Spectacle Blinds, Fig 8 Blinds
- Spades and Spacers
- Bleed Rings, Bleed Inserts
- Orifice Flanges and Orifice plates
- Tube plates
- Boiler Components

manufacture, we are absolutely able to meet that need," Mr Cavanagh said.

"We are a manufacturer with full ISO 9001 certification, and we can package flanges according to either engineering or project specification, capped off with remarkably short delivery times."

Caman Engineering's comprehensive flange stock is matched only by its diverse range of valve products.

As well as flanges, Caman also does bleed rings, spades, spacers and spectacle blinds - amongst many other products. To suit customer needs and demands, the range of products constantly evolves and a large range in stock is on hand and ready to go.

The major valve supplier leverages forged steel, stainless steel and cast steels to make unrivalled components for a

range of mechanisms spanning screwed, flanged, and socketed.

The quality products can withstand a vast array of demanding and challenging environments, including extreme pressure, fire, and other high-temperature applications.

Clients unsure of the products best suited to their requirements are supported by a dedicated and highly experienced sales team, which provides data sheets and drawings detailing the capabilities of each product.

With investment in state-of-the-art computer operated drilling and turning machines and a holistic understanding of industry needs, Mr Cavanagh said Caman Engineering would only continue to be a trusted and key supplier to the mineral resources sector.

"Caman Engineering is 100 per cent Australian and owned by the same family that started the company in 1954," Mr Cavanagh said.

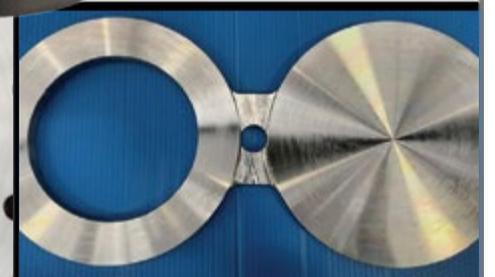
"We have evolved with the Australian mining sector, with knowledge passed down through the generations.

"Our leadership have built and sustained a successful business centred on customer service and high-quality products.

"We are an accredited company and approved manufacturer and supplier, able to fulfil the needs of oil, gas, mining and petrochemical companies all across Australia."

For more information, visit www.camaneng.com.au

AMR



Australia's largest independent stockist and manufacturer of pipeline flanges since 1954.

- Machines powered by Solar
- Pipeline flanges
- Valves
- Orifice plates & flanges
- 24 hours breakdown machining & supplies
- Spec blinds, spades, spacers
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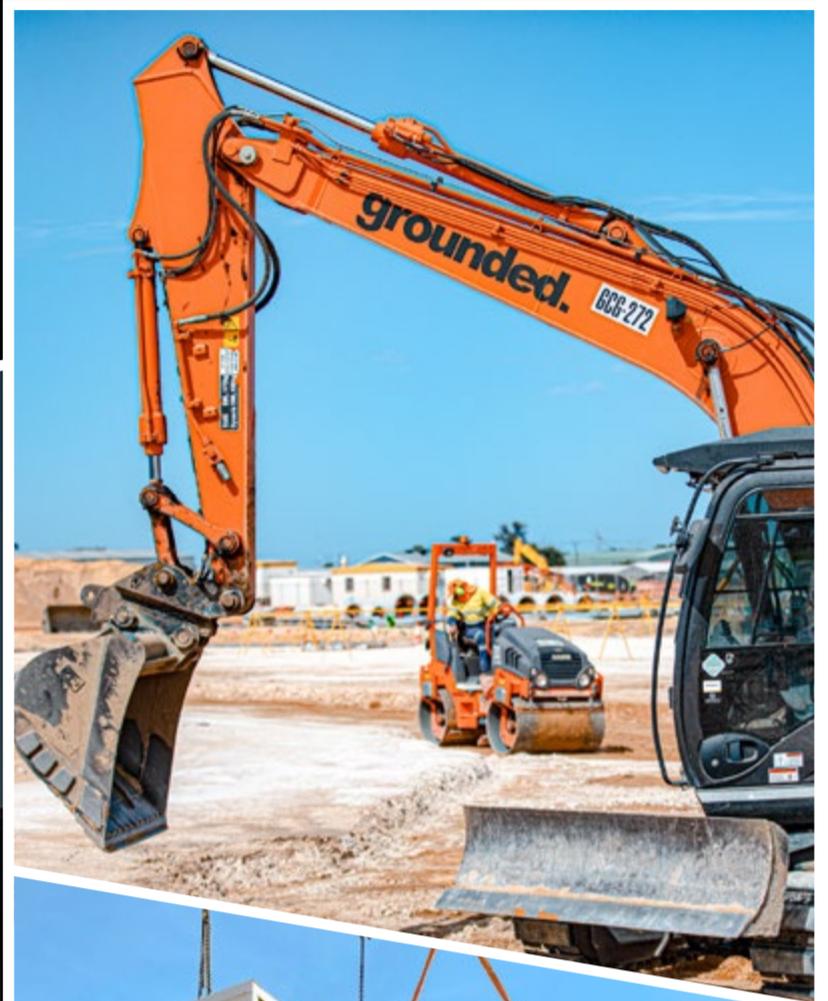
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EXPECT RESULTS

THE AUSTRALIAN MINING INDUSTRY IS FACING LONG TERM CHALLENGES IN ATTRACTING THE WORKFORCE OF TOMORROW.

The challenge is to improve, enhance and de-risk the skills & knowledge transfer required to build the next generation of miners. Trainers have a wealth of experience, but there is a global shortage, and many are retiring over the next decade. The solution is to capture mining knowledge into Digital Learning.

Digital Learning is interactive content and immersive experiences. They improve training consistency and knowledge retention - whilst freeing trainers to focus on coaching.

Problematically, much of the Digital Learning content being produced is inconsistently structured, not engaging, and ineffective.

Worse, most Digital Learning Producers lack mining knowledge and focus. This leads to higher costs, longer development times, and the lack of scale to be sustainable through industry cycles.

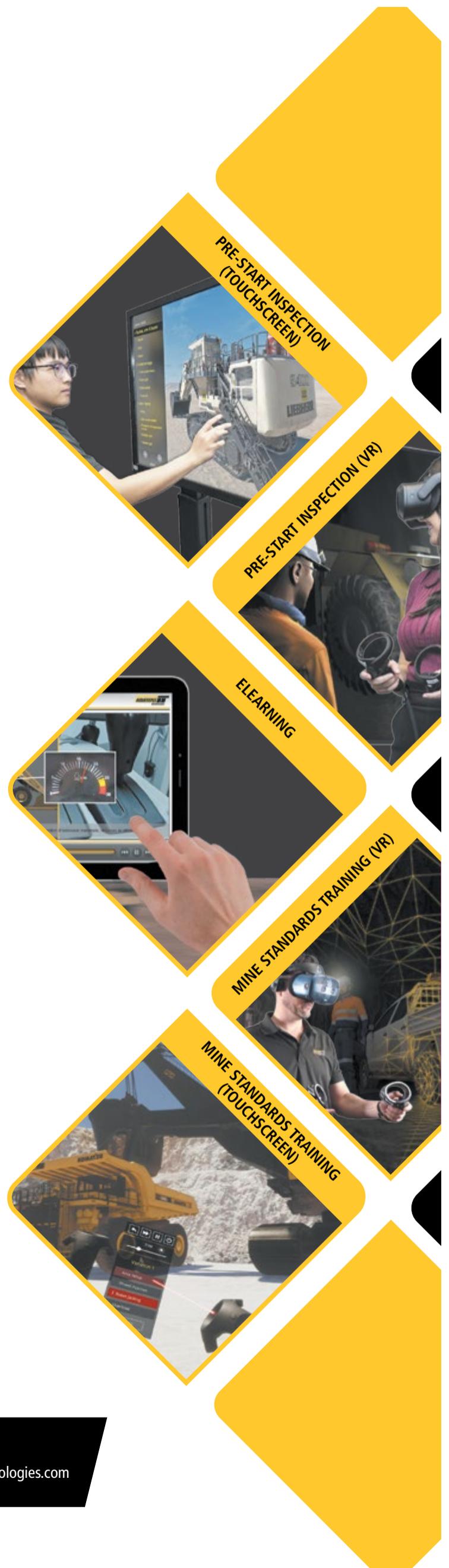
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With 31 years in business, we are the most experienced and largest Digital Learning developer in mining:

- Our extensive asset library makes Digital Learning development easier, and our scalability ensures lifecycle support.
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ADEPT – THE SAFE CHOICE

Does your core tray handling system involve large amounts of heavy lifting and manual handling? Does it cause WHS issues and lose you time and productivity?

A well-designed core sample handling system can save you time and effort, while improving productivity and workspace ergonomics.

From core sample tray conveyors to roller racks and benches to drill core handling systems, Adept Conveyor Technologies has extensive experience producing conveyor systems for the exploration industry.

Work Health and Safety on Site

The team at Adept can assist in the mitigation of work health and safety issues by providing proper hardware systems and solutions for materials handling.

Adept's mobile roller conveyor racks deliver optimum workflow, efficiency, and ergonomics, effectively and reliably.

There is no lifting work required by core tray operators as the roller racks can be detached and moved to make other configurations.

Both static and gravity conveyor systems offer low inertia and free movement of core sample trays throughout the sampling area, providing easy and safe operation for all manual handling staff.

Increased Efficiencies and Reduced Costs

Well-designed core sample handling systems can both increase efficiencies and reduce operating costs.

With easy and efficient movement of core sample trays, more can be achieved each day and overall productivity can be boosted.

In most cases, Adept's rollers and conveyors require no external power source to operate, providing the most economical options in system design and startup costs.

The cost of ownership is incredibly low, with the equipment being virtually maintenance-free.

Adept, The Safe Choice

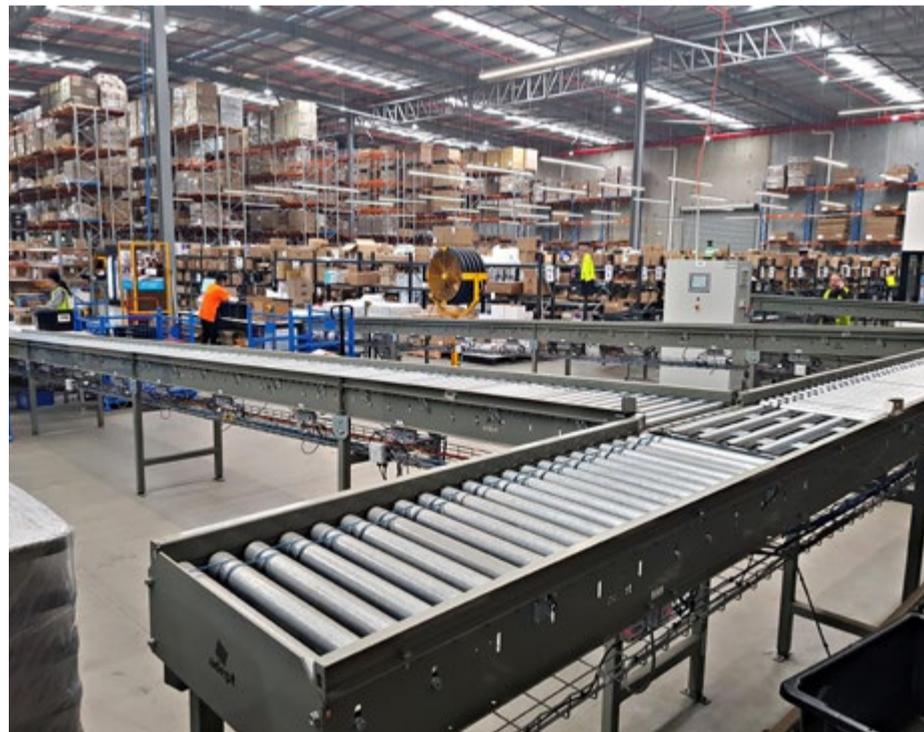
As a supplier with extensive field experi-

ence in drilling and mine sites, Adept services all exploration and analysis operations at remote sites as well as large and small industrial warehouses.

Purchasing direct from the manufacturer who can provide full in-house design and engineering expertise, allows you to cut out resellers who may have limited product application and engineering knowledge.

No matter what your situation, Adept Conveyor Technologies has the expertise and production ability to design and deliver a system to meet your exact requirements.

All parts are manufactured in Australia to quality benchmark standards and all systems are installed and commissioned right around Australia.



The range of products offered by Adept is comprehensive, and includes:

- Straight roller or skate wheel beds
- Split roller and tapered roller curves
- Personnel access gates
- Merges, diverges, and junctions
- Turntables
- Universal "multi-directional" roller tables
- Elevating conveyors
- Transfer devices
- Spring assisted lift tables
- Hydraulic lift table platforms
- Vertical elevators

Many more products are available to suit the requirements of any system.

Continuing Expertise Through a New Era

On Friday 22nd March 2024, Adept Conveyor Technologies and MRT Australia

were purchased by a new business named Adept Conveyors Pty Ltd.

This business was formed by a partnership between brothers James, Bill and David Larsen and their families, as well as their long time associate Stephen Henderson.

The new owners bring extensive experience in Australian manufacturing through their current and previous businesses.

Along with the dedicated and professional staff already employed at Adept, they look forward to building on the excellent work of the previous owners, Paul Johnson and Ross Simpson.

Central to the decision to purchase the assets of these companies was their unique offerings and the capabilities of the staff.

Stephen and the Larsen family feel that these benefits set the company up for growth and expansion, while continuing with the expertise and ability that Adept is renowned for.

The Future Plan

Even before the sale was complete, it was decided that James and his nephew, Kurtis Larsen, would work full time with the previous owners to consolidate their knowledge of the company and the wider industry.

The other owners are working part time for the company in various roles to support the company with their expertise. Paul Johnson is continuing on at Adept Conveyors in an advisory role throughout the handover, to ensure that the business continues running smoothly and provides the best possible value to all customers.

The new owners have great hopes for the business and plan to build on the existing capabilities to create a brand that is a renowned leader in the industry for quality products, outstanding customer service and comprehensive industry knowledge.

AMR

SOURCE:

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 Milperra, NSW 2214
 W: www.adeptconveyor.com.au



EPIROC'S COMMON AUTOMATION PANEL REVOLUTIONISES RIG CONTROL

The rise of automation continues to transform how miners control and overcome the operational challenges associated with their machinery fleets. As systems become more advanced and complex, there's an increased reliance on automated technology to improve the way operators connect with their equipment, including autonomous trucks, excavators, and drill rigs.

As part of improving fleet utilisation and performance, the ability to remotely control equipment from anywhere not only mitigates risks, but enables sites to better control costs and achieve productivity gains like never before.

Technology such as Epiroc's innovative Common Automation Panel (CAP) is helping asset owners streamline the value chain of their surface drilling operations, while creating a safer and more productive environment, and reducing operating costs.

"CAP is designed for teleremote and autonomous machines such as the SmartROC DTH surface drill rig and autonomous Pit Viper range," said Paul Skaife, Automation Drilling Solutions Product Manager at Epiroc Surface division.

"It is an evolution of a mine's control centre allowing users to operate multiple RCS-

based drill rigs from a remote location. With improved ergonomics and a platform approach to run mixed fleet operations, a remote operator can run multiple Pit Viper and SmartROC rigs, all from the same CAP station."

CAP provides opportunities to improve the layout in the mine control centre, and reduce variability and spare parts costs. CAP operation can also increase equipment wear life by ensuring that equipment operates within its optimal design parameters, which lowers maintenance costs.

Skaife added that CAP enables more consistent and predictable operations, and a lower overall cost of ownership.

"This will have a positive impact on decarbonisation and the health of operators in the long-term," he said. "We see increased demands in the areas of environmental, social, and governance (ESG), health and safety, and the integration of digital solutions that boost productivity. Our CAP system is the solution to these."

One station for a world of opportunities

By removing the boundary between onsite and offsite operations, CAP lets mining

companies take the next step towards the future of mining operations, significantly improving efficiency and operator safety.

The CAP system is a completely new design approach. It includes a high resolution 12-inch touchscreen display and joystick configuration, which enables effective operation of both the Pit Viper and SmartROC DTH drill rigs, as well as training of new operators.

The functionality allows operators to quickly and easily switch between machines with greater flexibility to run the fleet. The system was also designed with improved ergonomics in mind, with the panel situated comfortably in multiple positions.

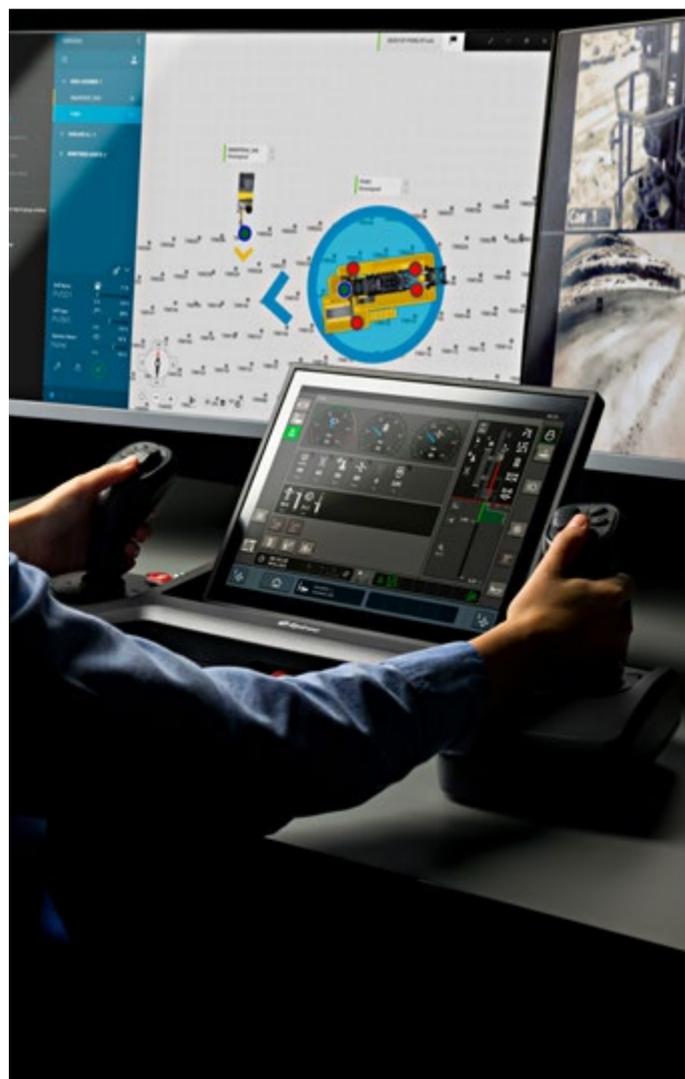
From a safety perspective, the system further reduces the office footprint and increase the total number of machines that can connect into a control room in a single system. This is important for situational awareness during remote operations and will reduce maintenance and operating costs for larger fleets.

The CAP system does not compromise on safety. An emergency stop release is fitted to each CAP station, and upon activation,



all machines on the same safety node will be shut down. Each station is also equipped with a button to activate the fire-suppression system on the currently allocated remote machine.

Each server rack is fitted with a number of machine safety controllers and CAP safety controllers. These are essential components of the control and safety system of remote drill rigs, and function to control the allocation and activation of emergency stops on remote machines. The server rack has the capacity to be connected to multiple CAP stations and can manage a mix of RCS-based rigs. **AMR**



MINE CONTROL CENTRES OF THE FUTURE

CAP not only enables the remote operation of a mixed fleet of RCS-based rigs, but transforms control-room operations and the way operators are trained. It is also an effective way of keeping operators safe, as they can work from a comfortable control room away from worksite hazards like dust and noise.

Mixed fleet control – A separate operator station for each type of machine is no longer required. CAP saves you time, is space efficient, and cost effective. It includes two multi-function joysticks, and remote rig functions are logically mapped to the CAP station, ensuring a smooth and rapid transition for operators.

Time-efficient – Operators can sit together in a remote location and run multiple rigs in a mixed RCS-based fleet. This avoids transport costs and saves travel time, increases interaction between operators, and makes for a rapid transition between operator shifts.

Scalable – One operator can control a number of RCS-based SmartROC and Pit Viper machines, one-at-a-time, from a single CAP station. Controls have been logically mapped over to the CAP station from remote rigs to ensure quick on-boarding for both new and existing operators. Future enhancements and software updates are easy to install, and the system can be expanded to accommodate extra machines.

Safety – An operator can run multiple, mixed rigs simultaneously, all from a remote control-room, which can be many kilometres from the worksite. This provides a safe work environment by completely removing personnel from hazardous areas.

Epiroc Australia
1300 366 880
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TAKING CONTROL OF LIQUIDS

Over three decades in liquid management, a fusion of product innovation, advanced manufacturing capabilities, and unique experience working on iconic projects, have continued to strengthen the liquid specialist's market offer.

That's why Coerco have become the go-to specialists for miners, civil engineers, and plumbing contractors, that are searching for innovative ways to solve their water treatment challenges.

Aside from a reputation for market-leading poly tanks, Coerco has made a splash in all aspects of liquid management and storage across both residential and commercial construction.

With customised solutions for process water, potable water, chemicals and waste systems, through to expertise around the installation of septic systems, the company applies expertise to help clients navigate the complex regulations and compliance requirements of infrastructure projects.

This expertise extends into the area of environmental assessments where Coerco leverages in-depth knowledge and experience to not only ensure the appropriate septic and wastewater treatment systems are used, but strict regulations are adhered to and project deliverables remain on schedule.

Wastewater Treatment

The acquisition of Aquarius Wastewater

Systems (AWS) in 2023 marked the next chapter in the expansion of Coerco's liquid management capability, particularly in wastewater. The acquisition of a like-minded and mutually passionate liquid specialist was strategically aligned to Coerco's commitment to both liquid management and environmental protection.

Coerco business development manager Daniel Rignall highlighted that the amalgamation of Coerco and AWS added significant value to its wastewater products and client base.

"By joining forces, our clients now have access to a comprehensive range of products and services, as well as technical support," said Rignall.

"AWS specialises in wastewater treatment systems for applications in the domestic, commercial and resources sectors. It also

offers a distinguished portfolio of products and services that include above and below ground aerobic sewerage treatment systems, sewer transfer stations, greywater recycling systems, and ancillary products."

Aerobic Treatment Units

Whether above or below-ground, every construction project requires the installation of an effective wastewater treatment system that meets stringent safety, environmental and industry standards.

Coerco's range of Aquarius Aerobic Treatment Units (ATUs) are designed to process wastewater from both residential and commercial properties.

These energy efficient, low maintenance commercial-sized wastewater systems are designed to treat wastewater produced from toilets, kitchens, showers, laundries, and in facilities like mining camps, facto-

ries, and caravan parks. This allows recycled water to be safely used for irrigating garden beds, orchards, and more, or for dispersal into leach drains, soak wells, and aqua-safe drains.

"Our O-2 NR and O-3 models go a step further by reducing phosphorous and nitrogen levels in the water, making them particularly beneficial for water catchment areas, environmentally sensitive zones, and in meeting local shire regulations," says Rignall.

"These models are recognised for their nutrient-retentive capabilities, which are critical for environmental conservation. As the most eco-friendly option in our range, the Aquarius O-3 utilises ozone in the final disinfection stage, surpassing chlorine in effectiveness and leaving oxygen as the only by product."

The below-ground ATUs are available in different sizes ranging from 1.8 to 30 kilolitres, which can be fully customised to suit specific site requirements. They also come in in different materials including poly or Duralen plastic, and concrete tank material. Similarly, the above-ground ATUs are heavy-duty modular tanks that are lightweight, easy to transfer and install.

All ATU models are fully approved by the WA Department of Health and meet AS/NZS 1546.3 standards.

Insulated Industrial Storage Tanks

Maintaining proper insulation for liq-





ABOVE AND BELOW GROUND

Liquid storage tanks is critical to safeguard the contents from extreme temperature changes. This is critical in different industries where the integrity and quality of final products relies on liquid processing and storage.

Coerco's liquid management solutions offer peace of mind, specifically for liquids that need to be stored at a consistent temperature. From small tanks to larger capacity designs, their insulated hexene polyurethane storage tanks are constructed as one-piece without any weak spots. This ensures strength and durability for extended life in tough environments.

Rignall explained the importance of tank insulation and how even the slightest temperature variations can have a significant impact on the quality of the internal contents.

"Insulated tanks minimise heat transfer between the tank's interior and exterior to maintain a consistent temperature of the stored liquids," he said.

"They offer several advantages including increased energy efficiency, more stable processing conditions, and greater protection from external environmental conditions. By reducing the need for excessive heating or cooling of the tank's contents, insulation leads to lower energy consumption, and therefore reduced costs. In chemical manufacturing or food processing where you need to maintain



a controlled, precise temperature range to prevent the contents from freezing, insulation helps achieve this stability."

Beyond maintaining internal temperatures, insulation shields the tank from external factors that can cause condensation or moisture-related corrosion, preserving the tank's structural integrity over time. It also safeguards personnel by preventing burns from hot surfaces.

There are a number of advanced features that make Coerco's insulated industrial storage tanks so efficient and ideal for different project applications.

Rignall provided further insight into the coating process. "We apply a specialised polyurethane foam, which is the same product used to insulate refrigerators. It's applied at any thickness required depending on the usage of the tank, but is gener-



ally 50 millimetres thick. A hard protective plastic coating is applied over the top of the foam, then finished with an acrylic top coat."

The foam adheres to the surface of the tank and stops condensation forming behind the insulation. It's structural soundness means it can hold itself in place, increasing the life expectancy of the insulation for many years.

"When it comes to the durability of the insulation, as it's a cellular plastic, it lasts as long as it's kept out of direct sunlight exposure," said Rignall.

"The polyurethane foam is a product that has been used in refrigeration insulation for many decades. There's nothing on the market that will beat it in a practical setting when dealing with hot or cold surfaces."

The tanks are also chemical and impact-resistant, UV stabilised, and available in a selection of sizes with optional fittings and accessories to meet various project requirements. **AMR**



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MINE DEWATERING:

AN ESSENTIAL PROCESS FOR ENSURING SAFETY & CONTINUITY IN MINING OPERATIONS

Effective dewatering is crucial for ensuring the safety and productivity of mining operations, particularly when extracting minerals below the water table or in open mines prone to rainfall.

A strong dewatering plan is not only beneficial – it is absolutely essential.

Understanding Mine Dewatering Challenges

The process of dewatering in mining plays a pivotal role in maintaining safe and efficient working conditions by extracting water from underground and surface areas.

Its primary purpose is to prevent flooding, groundwater seepage, and destabilisation of excavation sites.

Additionally, it facilitates access to mineral deposits and extraction processes.

Dewatering is essential for both open-pit and underground mining operations to prevent equipment damage and maintain productivity.

By implementing efficient dewatering strategies, operational efficiency can be optimised while minimising water management expenses.

Given the strategic importance of mine dewatering, it's vital that the chosen solution not only performs optimally under extreme conditions but also helps sustain routine operations.

Utilising KSB's UPA submersible borehole pumps within mining operations offers a strong and high-capacity solution for proficient dewatering processes.

These pumps ensure superior performance and unmatched reliability, thereby increasing operational efficiency and profitability.

KSB UPA Borehole Pumps: The Preferred Choice

Designed to excel in demanding mining environments, the UPA boasts unparalleled efficiency and reliability.

Its standout feature is its exceptional

performance in tough conditions, including exposure to corrosive fluids, varying liquid temperatures, and abrasive substances.

The UPA effortlessly handles large volumes and high pressure, a necessity when it comes to dewatering.

Its robust construction and use of premium materials, along with advanced investment casting techniques, guarantee a prolonged service life with minimal maintenance requirements, ultimately reducing operational expenses.

Furthermore, the UPA offers advanced technical attributes such as high-temperature motors, options for shroudless applications enabling the use of larger pumps within existing bore casings, and convenient disassembly/reassembly procedures.

Combined with comprehensive monitoring capabilities, these features facilitate seamless management and upkeep.

In hazardous mining environments, main-

taining safety and efficiency requires continuous attention and strategic investments.

Dewatering operations are pivotal for preserving the integrity and security of mining operations, necessitating a dependable, effective, and long-lasting solution.

The KSB UPA, with its superior design, durability, and high-performance capabilities, emerges as an exceptional investment, ensuring mines remain dry, secure, and operationally sound.

In the demanding realm of mining, where safety and productivity are paramount, KSB's extensive range of UPA submersible borehole pumps stands as an essential choice, guaranteeing the highest standards of safety and productivity in this dynamic industry. **AMR**

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