

# THE AUSTRALIAN MINING REVIEW

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**WA MINING**  
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## GROUP 6 METALS

### THE DOLPHIN TUNGSTEN MINE RESTART

**A**fter closing the Dolphin tungsten mine in 1992 due to prolonged low tungsten prices, Group 6 Metals (ASX: G6M) has restarted operations and began commercial production of tungsten concentrate earlier this year.

Located on King Island between Victoria and Tasmania, the Dolphin tungsten mine is known for hosting the highest-grade tungsten deposit of significant size in the western world. It has a JORC 2012 compliant mineral reserve of 4.43mt at a grade of 0.92% tungsten trioxide.

From 1917 to 1990, Dolphin operated on and off before being rehabilitated then ultimately closed, leaving only the old open pit which filled with water.

Group 6 Metals managing director and chief executive Keith McKnight spoke with the *Australian Mining Review* on the decision to restart production.

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Building a skilled, capable and experienced team of industry employees.

Find out more see story **P79**

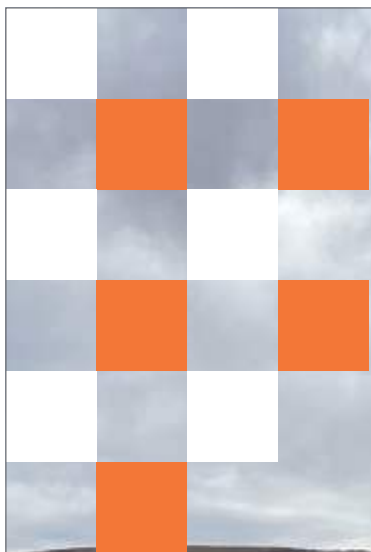


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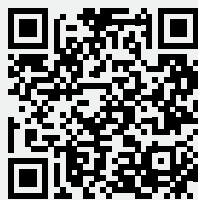
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# DIGGERS & DEALERS 2023

In its 32<sup>nd</sup> year, Australia's leading mining forum Diggers and Dealers combined 66 corporate presentations from mining and exploration companies alongside a large exhibition area housing over 159 exhibitors from the sector.

As it is every year, Diggers and Dealers was held in the unofficial gold mining capital of Australia, Kalgoorlie, WA.

Delegates included miners, explorers, brokers, bankers, investors, financiers and mining services industries from all around the globe.

The event enabled industry professionals to meet and network, visit mine sites, raise finances, invest in projects and engage with the resources sector.

This year, economist, writer and broadcaster Dr Linda Yueh was the keynote speaker. Dr Yueh is a Fellow in Economics at Oxford University and an Adjunct Professor of Economics at London Business School.

Other speakers included Chalice Mining (ASX: CHN) managing director and chief executive Alex Dorsch, Ramelius Resources (ASX: RMS) managing director Mark Zeptner and Northern Star Resources (ASX:NST) chief operating officer Simon Jessop.

Presentations focused on the shifting focus to future minerals, the resurgence and challengers in the nickel sector and WA's role in the energy revolution. Further, there were signs of a resurgent IPO market with consultants revealing they are continuously preparing technical assessment reports for floats.

## Awards

To cap off the event, awards were presented at the WesTrac Gala Dinner with lithium companies dominating.

Pilbara Minerals (ASX: PLS) received the Digger of the Year Award for its Pilgangoora lithium project, Allkem (ASX: AKE) was crowned Dealer of the Year and Patriot Battery Metals (ASX:PMT) won the Best Emerging Company Award.

Over the past year, Pilbara Minerals' sales volumes were up 68% and revenue increase 238% to \$4b, while Allkem was recognised for the merger with Livent Corporation to create an integrated global lithium chemicals producer.

Former Barminto chief executive Neil Warburton was the recipient of the GJ Stokes Memorial Award. This prize was a nod to Mr Warburton's 40-year career in the mining industry which he began as a graduate of the WA School of Mines.

AMR

## REBELLION AGAINST RESOURCES

The Perth home of Woodside chief executive Meg O'Neill was targeted by climate activists on the morning of Tuesday 1 August, with the mining company's Perth headquarters also evacuated due to protest activity involving gas.

Four people have been charged from the activist group Disrupt Burrup Hub over the incident at Ms O'Neill's home.

A Woodside spokesperson says "this is an unacceptable escalation in activity designed to threaten and intimidate by an extremist group which has no interest in engaging in respectful and constructive debate about Woodside's role in the transition towards a lower-carbon world".

"Illegal activity like this only serves to distract from the real work being undertaken to achieve decarbonisation," the statement continued.

Ms O'Neill said "this was not a 'harmless' protest" and that "such acts by extremists should be condemned by anyone who respects the law and believes people should be safe to go about their business at home and at work".

On the other side of the country, Bravus Mining and Resources has released images showing the squalor left behind by an anti-coal activist on its Carmichael mining lease near Clermont in Central Queensland after camping unauthorised for almost two years.

In a statement by Bravus, it said the activist opposed the mine despite the "overwhelmingly majority of Traditional Owners who negotiated an Indigenous Land Use Agreement with Bravus Mining and Resources" to manage cultural heritage and the environment at the mine.

AMR

## MINING CONTRIBUTES RECORD \$455B IN EXPORT REVENUE IN FY23



Mining contributed a record \$455b in export revenue for Australia in FY23, highlighting the importance of the industry to the nation's economy, government revenue and regional jobs.

Released by the Australian Bureau of Statistics (ABS), this figure represents 66% of all export revenue for the nation and is 10.5% higher than FY22, which was a previous record year.

This figure showed that thermal and metallurgical coal export revenue totalled \$128b, iron ore \$125b, gold \$27.4b, aluminium \$14.9b and copper \$12.5b.

A strong growth was seen in technology metals such as nickel, 51%, zinc, 30%, copper, 17% and coal, 11%.

A 5% increase was also seen in gold export.

Minerals Council of Australia chief executive

Tania Constable says the mining industry's significant contribution to the nation's export earnings cannot be taken for granted.

"[Australia] can't afford to miss the opportunity to attract a share of the US\$180b (A\$273b) per year in global mining investment over the next two decades needed to meet the world's colossal energy transition," she said.

Referring specifically to the Federal Government's proposed Same Job, Same Pay legislation, Ms Constable says "Australia risks dealing itself out of trillion-dollar critical minerals markets unless it gets serious about addressing rising costs, declining productivity and increased policy risks".

Over the past decade, the total contribution of minerals, metals and energy commodities to export revenue totalled \$2.7t.

## Critical Minerals List Update

The Federal Government has also called for industry input to update the Critical Minerals List by the end of this year.

Federal Resources and Northern Australia Minister Madeleine King says building a strong and reliable critical minerals sector will help Australia and the world achieve net zero emissions, while "creating thousands of new jobs and supporting economic growth for decades to come".

"The path to net zero runs through Australia's resources sector," she added.

Australia is the world's largest producer of lithium, the third largest producer of cobalt and fourth largest producer of rare earths, with significant amounts of nickel and copper too. AMR



# MinRes

## TO DEPLOY WORLD-FIRST AUTONOMOUS ROAD TRAINS, INVESTS \$26.6M IN BINDING SOLUTIONS

**M**ineral Resources (ASX: MIN) will deploy the world's first fully autonomous road trains equipped with autonomous haulage solutions, thanks to a landmark agreement with specialists Hexagon AB.

The fleet of 120 road trains has been designed and developed for the diversified miner's flagship Onslow Iron project in WA.

MinRes chief executive of mining services Mike Grey says the company is excited to cement its partnership with Hexagon to deliver the world's first fleet of autonomous road trains.

"[This] will be an essential part of Onslow Iron's safe, efficient and dust-free solution for hauling ore," he said.

"Automation will remove the risk of driver fatigue, lower operating costs and reduce fuel use and emissions.

"There's enormous potential for these vehicles to transform mining across the world."

Operational benefits include the removal of driver fatigue risk, increase of fleet availability, reduction of operating costs, including fuel use and emissions, as well as creating a dust-free supply chain.

The centre of the autonomous platooning

system is Hexagon's autonomous solutions stack integrating drive-by-wire technology with an autonomous management system to orchestrate vehicle movement in road train haulage.

A team of operators will control the fleet from a central operating centre in Onslow.

Testing of autonomous road trains has been progressing at MinRes' Yilgarn iron ore operations since late 2021 ahead of the technology's deployment at Onslow Iron.

### Binding Solutions Investment

Mineral Resources has invested \$26.6m in UK-based Binding Solutions (BSL), a technology company that significantly reduces energy use and emissions in the productions of iron ore pellets.

Binding Solutions will use the investment to progress the design and construction of a demonstration plant capable of producing around 50t per hour of cold-bonded iron ore pellets.

Using minimal heat and limited energy, BSL's process produces high-quality pellets or briquette (compressed block of coal dust) products for the iron ore and steel industry.

This technology reduces energy use and carbon dioxide emissions by up to 95%

and 93%, respectively, compared to traditional processes. It also virtually eliminates sulphur oxide and nitrogen oxide emissions.

Mineral Resources' managing director Chris Ellison said this technology has the potential to play a major role in the world's decarbonisation strategy.

"BSL's technology has the potential to rapidly play a major role in the decarbonisation of the global steel industry," he said.

"MinRes has a track record of using innovation to solve problems and unlock value, and we are excited to partner with BSL to support this innovative technology."

Mineral Resources has the right to licence the BSL technology to manufacture cold-bonded pellets from iron ore at its own mines.

### Partnering with Lithium Australia

Mineral Resources and Lithium Australia (ASX:LIT) also entered a joint development agreement to further develop technology that has the potential to be a game changer in lithium extraction.

MinRes will invest up to \$4.5m to fund the development and operation of a pilot plant and an engineering study for a demonstration plant.

(Image source: Mineral Resources) Hexagon equips the world's first fully autonomous road trains at Mineral Resources' Onslow Iron project in the Pilbara, WA.



(Image source: Mineral Resources) Mineral Resources chief executive, iron ore, Chris Soccio with cold-bonded iron ore pellets.

Lithium Australia's LieNA technology has the potential to enhance lithium extraction yields by up to 50% over current market performance. This technology is underpinned by recovering lithium from fine and low-grade spodumene, improving mining efficiency, sustainability and potential profitability.

Mineral Resources chief executive Joshua Thurlow commented on the agreement.

"The goal is to fast track the commercialisation of LieNA to drive efficiencies and initially extract more value from our two world-class lithium operations in WA," he said.

Subject to the results of the pilot plant, Mineral Resources and Lithium Australia will form a 50:50 joint venture to own and commercialise the LieNA technology through a licensing model. **AMR**

## FORTESCUE METALS ACHIEVES RECORD IRON ORE SHIPMENTS FOR FY23

**I**ron ore shipments of 48.9mt in Q4 FY23 contributed to Fortescue Metals (ASX:FMG) achieving record shipments of 192mt for FY23.

This is 2% higher than FY22 and achieved the top end of market guidance.

FY23 represents the fourth consecutive year of record shipments, reflecting strong performance across the entire supply chain.

Fortescue chief executive Fiona Hick commented on the record shipment.

"The Fortescue team has delivered outstanding results for the June quarter, with iron ore shipments of 48.9mt, contributing to our highest ever annual shipments of 192mt, achieving the top end of shipments guidance," she said.

In late July, Fortescue shipped the first de-

livery of high-grade magnetite to Vietnam from its newly built Iron Bridge operations in WA.

FY24 shipments are anticipated at around 7mt with ramp up to full production capacity of 22mtpa expected within 24 months.

Iron Bridge is expected to transition to operational production in mid-August 2023 while completion of the construction of dry circuit B remains on track for September 2023.

Additionally, first ore was mined and loaded on train at the Belinga iron ore project in Gabon with the first shipment expected by the end of the year.

Ms Hick said Fortescue celebrated these milestones in the year.

"Fortescue recently celebrated several milestones, including first magnetite con-

centrate production from Iron Bridge," she said.

"It signifies Fortescue's entry into the high-grade iron ore market segment which enables us to provide our customers with an enhanced product offering.

"The Belinga iron ore project in Gabon continues to make strong progress with the first ore loaded on train and delivered to port during the quarter, less than six months from when the mining convention was signed."

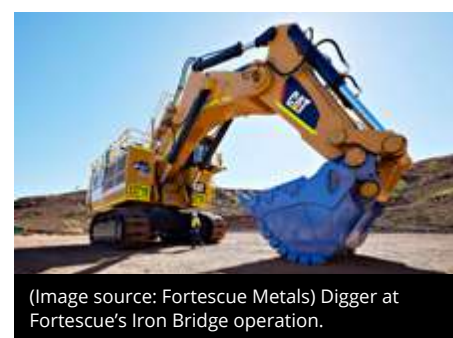
Continued progress on decarbonisation was made with the first battery electric haul truck prototype delivered to the Christmas Creek site for testing in the Pilbara operating conditions.

In July 2023, Fortescue acquired the Phoenix Hydrogen Hub in the US, with phase one of the project proposing an 80MW

electrolyser and liquefaction facility, capable of producing up to 12,000tpa of liquefied green hydrogen.

Continued focus on safety was paramount for the company, with a total recordable injury frequency rate of 1.8 in the 12 months to June 30, 2023.

Fortescue's guidance for FY24 shipment falls between 192-197mt, including roughly 7mt from Iron Bridge. **AMR**



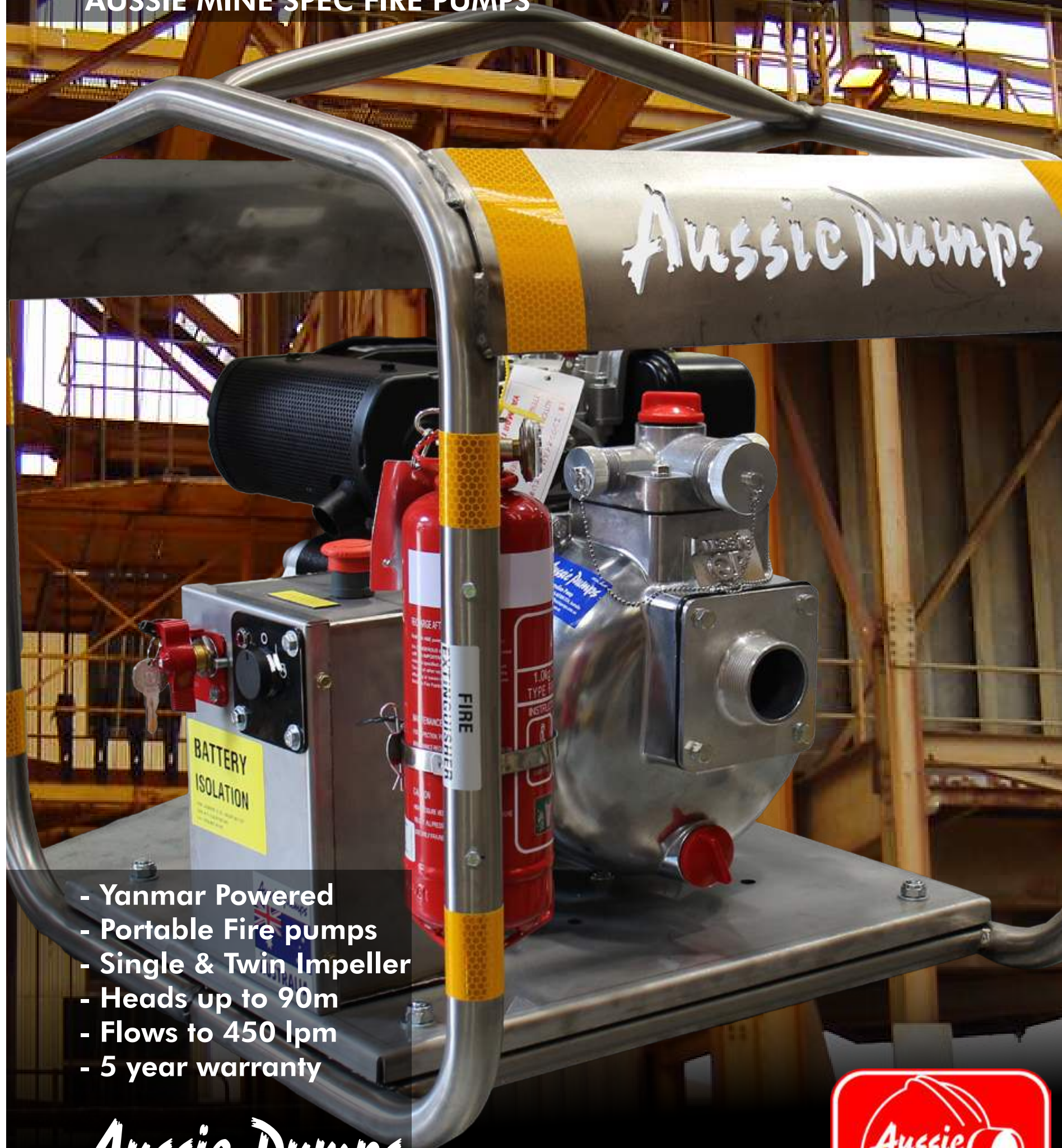
(Image source: Fortescue Metals) Digger at Fortescue's Iron Bridge operation.



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Aerial view of a tailings dam and processing plant in the Northern Territory.

# RIO TINTO

## RELEASES INFORMATION OF TAILINGS FACILITIES IN ALIGNMENT WITH GISTM REQUIREMENTS

**R**io Tinto (ASX: RIO) has released detailed information on 14 of its global tailings facilities and their progress towards conformance with the Global Industry Standard on Tailings Management (GISTM).

These tailings facilities are those rated very high or extreme under GISTM classifications, based on the highest potential consequences in the extremely unlikely event of a failure.

Rio Tinto chief technology officer Mark Davies commented on the release of information.

"Since the tragic failure of the tailings facility at Brumadinho in Brazil in 2019, the entire industry has been working to improve the way we manage tailings facilities," he said.

"Responsible tailings management is critical to ensure the safety of our people and communities and to protect the environment.

"We have made considerable progress since August 2020 towards conformance with the GISTM.

"Good tailings management is also about

transparent partnership, and we have been working with the local communities near our facilities to increase awareness of our management practices and how we can best work together to continue to keep people and the environment safe from harm."

Tailings facilities are reservoirs that store mine tailings – fine-grained waste material that is discharged from an ore processing plant or coal preparation plant.

Often, the tailings leave the mine processing plant in a slurry form and are usually,

but not always, stored on the surface in storage facilities.

Failure to maintain the slurry can result in risks to the public health and safety to the community and environment.

In January 2019, a tailings dam at the Córrego do Feijão iron ore mine in Brazil suffered a catastrophic failure, which resulted in the death of 270 people.

The collapse of the tailings dam released a toxic tidal wave of tailings, engulfing buildings and polluting the water supply of a nearby river. **AMR**

# TOYOTA AUSTRALIA-BHP PARTNERSHIP DRIVES DECARBONISATION THROUGH ELECTRIFICATION OF LIGHT VEHICLES



(Image source: BHP) (L-R) Toyota Australia president and chief executive Matthew Callachor and BHP president for Australia Geraldine Slattery. The object they are holding is a Daruma doll, which was handed from Toyota to BHP as part of a Japanese custom symbolising partnership. One eye is painted on at the beginning of the partnership, and the second eye is painted on when the goals of the partnership are achieved.

**T**oyota Australia and BHP (ASX: BHP) have signed a Memorandum of Understanding (MOU) aimed at enhancing safety and decarbonisation measures within BHP's Australian operations.

The two industry-leading brands will work together across safety, engineering and product development teams, focusing on safety in light vehicles design and future state technologies and challenges.

Toyota Australia president and chief executive Matthew Callachor welcomes the collaboration.

"BHP is a key player in Australia's export industry, and Toyota Australia is delighted to announce this collaboration which is designed to enhance safety measures at BHP's Australian worksites and reduce vehicle operation and other CO2 emissions on BHP sites," he said.

Through this MOU, BHP will gain access to the knowledge and resources of Toyota's

expert engineering teams across Australia and globally.

This partnership aims to support BHP in realising its broader decarbonisation goals, which includes reducing greenhouse gas emissions by 30% by 2030.

Both companies will explore a range of options and solutions for lowering vehicle operation emissions, including alternative technologies that support BHP's decarbonisation journey.

BHP president for Australia Geraldine Slattery recognises the strong partnership forged between the two brands from this collaboration.

"At the heart of our efforts to decarbonise our operations is an ambition to electrify our fleet of 5000 light vehicles in Australia," she said.

"Collaborating with leading suppliers like

Toyota shows our clear commitment to developing shared solutions for a safer and more sustainable future."

BHP group procurement officer James Agar emphasises the importance of successful partnerships.

"Combining our engineering expertise and resources with Toyota is a terrific example of the approach we are taking with major suppliers to develop new technologies that will improve our safety and sustainability," he said.

"It's an exciting project and there's plenty of work to do, but we're up for the challenge and we look forward to seeing what we can do together."

Once completed, the capabilities developed through the partnership are expected to provide a blue-print for other organisations seeking to safely electrify their light-vehicle fleets and contribute to decarbonisation. **AMR**





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Point Moore Lighthouse in Geraldton.

Pilbara landscape after a cyclone.

# GREEN AMMONIA PLANT

## PROPOSED FOR GERALDTON AND LANDMARK AGREEMENT SIGNED TO AID IN PILBARA DECARBONISATION

An exclusive negotiation period is underway between the WA State Government and a major South Korean renewable energy consortium to establish a green ammonia plant near Geraldton.

In partnership with Samsung C&T and Korean Midland Power Co (KOMIPO), Progressive Green Solutions are proposing to build a plant on two lots at Development-WA's Narngulu Industrial Estate.

Situated 12km southeast of Geraldton, Narngulu Industrial Estate is an important general industrial precinct for Geraldton and the Mid-West region.

Once operational, the facility is expected to produce 1mtpa of green ammonia using renewable hydrogen. It is also expected to help support the decarbonisation assets in South Korea with first shipments expected in 2027.

WA Energy Minister Bill Johnston said the State's Mid-West is attracting significant global interest.

"WA is perfectly positioned to provide the

land, infrastructure and skills required to develop large scale renewable hydrogen and green ammonia projects," he said.

"With its exceptional renewable energy resources, the Mid-West is attracting significant global interest and investments from markets such as South Korea, Japan and Europe, seeking to support the decarbonisation of their economies."

Member for Geraldton Lara Dalton said the partnership highlights the state's role in assisting global decarbonisation.

"The interest from international proponents in establishing renewable energy products in Geraldton validates the renewable potential of the Mid-West region and highlights WA's exciting role assisting with global decarbonisation," she said.

"We look forward to growth in the renewables sector across WA leading towards a better decarbonised future."

### Horizon Power Battery

The State's regional energy provider, Horizon Power, has purchased a vanadium redox flow battery for a long-duration en-

ergy storage pilot in Kununurra, in north-west WA.

The 78kW/22kWh battery will enable Horizon Power to test the capabilities of providing long periods of 100% renewable energy.

The battery can store high volumes of excess energy, provide backup power during peak demand or when the power supply is interrupted and minimises the need for fossil fuel generation and grid infrastructure upgrades.

"Vanadium redox flow batteries are specifically designed to deliver energy over a long period of time, which is crucial for achieving the high levels of decarbonisation we are after," Minister Johnston said.

"If the pilot is successful, there is potential to expand the use of long-duration, 100% renewable energy across Horizon Power's 2.3km<sup>2</sup> network."

The battery is expected to arrive in Perth early 2024 and after successful testing, will be transported to Kununurra.



### Pilbara Decarbonisation

The WA State Government has announced that members of the 'Pilbara Industry Roundtable' (PIR) have agreed on common use electricity infrastructure in the Pilbara.

This agreement recognises the importance of supporting increased use of renewable energy in the Pilbara.

Members of the PIR include WA Minister for Energy Bill Johnston and representatives from Rio Tinto, BHP, Fortescue, Roy Hill, Woodside, Horizon Power and the Chamber of Minerals and Energy of Western Australia, amongst many more.

WA Climate Action Minister Reece Whitby said this is a significant step towards a clean energy future.

"It's important we work together with major resources companies to reach our ambitious decarbonisation targets," he said.

"Our vision is for WA to become a world leader in renewable energy. Our government is committed to achieving new zero greenhouse gas emissions by 2050." **AMR**

## MINING REHABILITATION FUND TO UNDERGO INDEPENDENT REVIEW

WA Mines and Petroleum Minister Bill Johnston has announced an independent review of the Mining Rehabilitation Fund (MRF) to ensure it continues to meet its objectives and sufficient financial reserves are available.



Loader loading a semi-trailer with iron ore.

SEPT2023 AMR

The MRF is used by the WA Government if a mine operator is unable to meet their rehabilitation obligations and the site is declared abandoned.

Economic consultants Marsden Jacob Associates will undertake the review and consult with a wide range of stakeholders that completed an MRF evaluation in 2018.

The *Mining Rehabilitation Fund Act 2012* (MRF Act) was created to ensure the mining industry is financially responsible for restoring existing and abandoned mine sites — not WA taxpayers.

WA tenement holders, except those under State agreements, are required to pay an

annual levy to the fund with contributions based on the level of ground disturbance on the tenement.

A statutory panel monitors the MRF financial reserves and levy contribution rate to ensure they meet current and emerging rehabilitation liabilities.

The MRF also provides funds to address legacy mine sites and is currently supporting the *Safer Shafts for Towns* project that remediates risks close to regional communities.

The MRF Act requires an independent review to be undertaken within 10 years of its commencement.

Mr Johnston commented on the review.

"The [WA] Government remains committed to achieving a successful balance between robust environmental standards and a strong and dynamic resources sector," he said.

"We will continue to work with industry and the community to ensure we deliver best practice mine rehabilitation outcomes for our state.

"The Mining Rehabilitation Fund's support of abandoned mines, like Ellendale (diamond mine), are invaluable as it helps to assess risks and identify any remediation works to benefit the local community." **AMR**





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Our meteorologists conduct a thorough assessment of climate impacts on your business and existing management systems. Tailored solutions enhance procedural efficiency and profitability. Receive risk-based weekly forecasts with multi-level alerts, specific commentary, and on-site monitoring 365 days a year. Industry experts provide tailored briefings and actionable insights to streamline decision-making.



### WZBob

**Weatherzone's WZBob expansion system extends your lightning alerting capabilities in the field, ensuring your staff stay safe and aware.**

Ensure simultaneous site-wide lightning risk communication for all, including contractors and visitors without an existing alerting system. Light and sound alerts minimise reliance on distracting mobile notifications, allowing quick action when thresholds are breached. Customise WZBob to your Trigger Action Response Plans (TARPs) and other safety requirements for simplicity.



### Weather Station

**The ObsConnect Weather Station from Weatherzone, a DTN company, is a turnkey solution: expertly calibrated to monitor weather and environmental observations on-site.**

The ObsConnect Weather Station, a compact all-in-one sensor, integrates precise measurements using state-of-the-art technology. It withstands extreme environments, guarantees reliability with scheduled maintenance, and offers secure, validated data visualisation without specialised tools, reducing deployment time and costs.



### Blast Modelling

**Bringing you an integrated service with intuitive design capability: blast planning has never been so easy.**

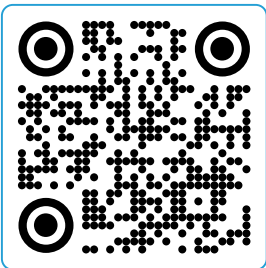
Our expert meteorology team offers top-notch environmental monitoring with integrated dust monitors and TEOM for precise forecasts. The Blast system automates advanced reporting, consolidating weather station data into informative reports, ensuring compliance with mining regulations through auditable blast reports in the cloud.



### Opticast

**Weatherzone's industry leading, high-precision forecast system is optimised for "real-time nowcasting" and out to 15 days, delivering profitable knowledge.**

Opticast, an intelligent forecast system, adapts to local conditions, using machine learning to predict undetectable winds. Real-time verification through on-site observations ensures accurate updates every five minutes, delivering over 30 meteorological parameters to your customisable interface. By integrating global and regional models and eliminating bias, Opticast optimises local forecasts.



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# FUELFIX. TWO PATHWAYS, ONE GOAL.



As the world transitions towards a low emissions future, the demand to combine traditional fuels with renewable and next generation alternatives continues to gain pace. Fuelfix & Tanks2Go (Fuelfix) is committed to helping its customers in their journey to a clean energy future through innovative energy management and storage solutions. Leveraging extensive hydrocarbons expertise, Fuelfix is well placed to provide best in class solutions to customers in the form of the right sized fuel infrastructure in the right location that optimises fuel usage when it comes to cost, maintenance, and emissions.

## Hydrotreated Vegetable Oil (HVO) Fuel Storage Solution

Every customer has a unique pathway to navigate to optimise energy efficiency and emissions without impacting reliability. In response to operational requirements, Fuelfix developed an HVO fuel storage solution for a trial on the use of HVO at one of our major client's mine sites in Western Australia's Pilbara region.

In collaboration with their fuel supplier, the renewable diesel made from HVO was used

in haul trucks and other mining equipment over a three-month trial period.

With around 40% of the iron ore miner's operational greenhouse gas emissions originating from diesel fuel, HVO remains a core focus of its decarbonisation strategy. HVO's clean burning properties reduce particulate production, which help improve engine cleanliness and reduce emissions.

Based on a strong partnership built over many years, the mining company approached Fuelfix in the early planning stages to discuss the design and installation of the fuel storage infrastructure that best suited the unique aspects of the trial. The significance of the trial among internal and external stakeholders demanded a rigorous process in order to achieve success.

The company's key requirements from the outset were the need for reliability, safety, ability to maintain product quality while handling different blends of the renewable diesel, as well as accurately measuring the dispensed volume during the trial period. Being a trial, it also needed to be available under a flexible hire arrangement.

## Specialists in Engineered Solutions

The key safety features of the facility included a distinct separation of refuelling vehicles and fuel tankers unloading into the tanks. The design included high mast fuel hoses to minimise refuelling manual handling risk, in-ground Fuelfix spill grates to contain leaks and drips, and a Fuelfix emergency shower and eyewash station. Built and tested offsite, the facility was safely installed and commissioned by Fuelfix's hydrocarbons technicians and electricians.

Fuelfix arranged for the hire tanks to be internally cleaned prior to use, and installed filtration systems on both the tanks and dispensing systems to ensure the highest fuel quality. Fuelfix also developed a specific procedure to control the trial of different renewable diesel blends to ensure the integrity of the analysis undertaken following the trial.



Strict controls on the heavy vehicles that used the product during the trial and accurate measurement of the fuel used, was achieved by Fuelfix integrating the company's specified fuel management system into the hire solution, and the installation of specific refuelling nozzles and receivers on the fuel facility and heavy vehicles respectively. This integrated approach gave them the confidence that only specific vehicles were able to refuel and accurate fuel usage captured.

## Customer-Centric Solutions

Although a highly bespoke solution, Fuelfix was able to offer their customer a short-term hire arrangement. This enabled them to avoid the upfront capital outlay, keep

the facility for as long as they required, with accessibility to the technical, maintenance and backup support of the Fuelfix team for the duration of the trial. As part of the trial scope, Fuelfix also provided specialised engineering expertise, full project documentation and drawings, and undertook a mid-trial maintenance and inspection check on the facility.

Upon completion of the trial period, the mining company acknowledged Fuelfix's safe execution and high level of responsiveness throughout the planning and implementation phases of the project.

Ultimately, their aim is to have fully electric trucking fleets at their sites, but alternative fuels like HVO may help with emissions reductions in the meantime while the electrification transition takes place.

Fuelfix is confident that it can be a trusted partner for other organisations looking to explore the benefits of HVO and other renewable energy sources.

Simon Fracaró, General Manager WA, said Fuelfix were really pleased to be involved in this project and assist with this significant trial in the renewable energy space.

"It leveraged off our hydrocarbons expertise and complements Fuelfix's strategy to help its customers in their energy transition journey," he said.

"Helping customers take actions now to mitigate, eliminate, and offset their carbon emissions, whilst reducing energy costs, is at the core of all our work in the industry."

For more information, visit  
[www.fuelfix.com.au](http://www.fuelfix.com.au)

AMR







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Committed to helping customers in their journey to a clean energy future through innovative energy management and storage solutions.

Through our comprehensive range of fuel, hybrid and battery driven equipment, and nationwide branch network, Fuelfix delivers a suite of integrated services to improve operational energy efficiency without risk to reliability.

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energy & emissions solutions  
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# MARKET CAP OF WA LISTED COMPANIES HITS \$363B, UP 21%: DELOITTE

Deloitte has released a special 2023 Diggers & Dealers edition of the Deloitte WA Index showing that WA-based listed companies closed FY23 up 21% with a total market capitalisation of \$363b.

The companies linked to carbon reduction and battery-associated minerals have seen their value spike, shrugging off concerns weighing on the broader commodity markets.

Deloitte WA audit and assurance partner Dave Andrews says the Deloitte WA Index outperformed the broader ASX All Ordinaries again.

"It is clear that battery-based solutions are critical to the electrification of vehicles and general mobility and it's no surprise battery technologies, EVs and lithium stocks are the talk around town," he said.

"The investments in this technology, and rising uptake of EVs from consumers, is a testament to its ongoing success."

Fortescue Metals Group, with a market capitalisation of \$68.2b, regained the top ranking in the Index, ahead of Woodside (\$65.4b) and Wesfarmers (\$56b).

Together, the big three accounted for \$189.6b, more than 50% of the value of the WA Index.

The top three movers in the WA Index **Top 20** by market capitalisation growth for FY23 were:

- **Liontown Resources** – increasing by 169.5% to \$6.2b;
- **Pilbara Minerals** – increasing by 115.1% to \$14.7b;
- **De Grey Mining** – increasing by 85.1% to \$2.1b.

The top three movers in the Index **Top 100** by market capitalisation growth for FY23 were:

- **WA1 Resources** – increasing by 5,251% to \$311.7m;
- **Meteoric Resources** – increasing by 2,220% to \$389.5m;
- **Azure Minerals** – increasing by 950% to \$587.3m.

### Sustainability and Future Energy

The Index also includes a special report on the role of hydrogen in WA's geographically-diverse future, including green hydrogen potentially becoming a viable and complementary solution to solving domestic challenges in heavy haulage and long-haul transport networks.

With the Federal Government's aims to reduce emissions by 43% by 2030 (from 2005 levels) and Net Zero by 2050, challenges surrounding renewable energy projects include the emerging 'arms race' to get the same materials, engineering and construction services for these projects, project governance, managing scope and change, collaboration with stakehold-

ers and community, as well as the transformative power of technology.

### Bold Action Needed Now for 2030 Targets

Deloitte has also urged the Australian mining industry to step out of strategy mode and into action mode, at scale, to mitigate the financial risks of ambitious emissions reductions and 2030 sustainability targets.

Releasing its *Countdown to 2030: Bold action for a sustainable mining future* at the Diggers & Dealers conference, Deloitte's lead author and risk advisory partner Celia Hayes says there are seven years remaining for mining businesses to stay relevant in this sector.

"This is therefore a period of immense change for Australia and our mining industry, and so the mining companies of 2030 will look and feel very different to those of today," she said.

Hayes said investing in future leaders and welcoming new ideas was one of seven critical areas for action the sector must take over the next few years to create a more sustainable mining industry.

The others are: integrating circular economy principles; valuing natural systems effectively; investing in sustainable water management; focusing on climate adaptation; meaningfully engaging with communities; and going beyond mandatory reporting requirement. **AMR**



The Deloitte booth at the recent Diggers & Dealers. An artist was on-hand to draw event attendees' suggestions of "What can the mining sector do now to shape a more sustainable tomorrow?" directly on to the board.

# PILBARA MINERALS & CALIX

## MAKE FINAL INVESTMENT DECISION FOR MID-STREAM DEMONSTRATION PLANT



(Image source: Pilbara Minerals) Pilgan Plant at the Pilgangoora project.

Lithium producer Pilbara Minerals (ASX: PLS) and environmental technology company Calix (ASX: CXL) have made a final investment decision to construct and operate a mid-stream demonstration plant at the Pilgangoora project in northwest WA.

The project aims to demonstrate the potential to reduce carbon emissions intensity for the hard-rock lithium supply chain via the creation of a high-purity lithium-rich chemical salt using electric calcination that could be powered by renewable energy.

Life cycle assessment studies commissioned by Pilbara Minerals have calculated that when using 100% renewable electricity for electric calcination, the carbon emissions intensity of spodumene calcination can be reduced by more than 90% when compared to using coal.

Potential reductions in carbon emissions are also anticipated from producing a mid-

stream product by avoiding the transport of waste associated with spodumene concentrate.

It aims to demonstrate the benefits of producing a mid-stream lithium enriched product using Calix's patented electric kiln technology.

Calix chief executive and managing director Phil Hodgson said the company is delighted the project has passed final investment decision.

"We are delighted that the project has passed the final investment decision milestone," he said.

"Together with Pilbara Minerals, we look forward to demonstrating the potential of our electric calcination technology to dramatically reduce the carbon footprint of Australian lithium.

"The success of the joint venture will also showcase the opportunity of combining

Australian mineral and renewable energy resources with innovative Australian technology to enable the reliable and sustainable supply of value-added critical minerals to the world."

As well as reducing calcination carbon emissions intensity, the project also aims to enable greater value extraction from hard-rock lithium assets.

Potentially, this will enable more value to be captured onshore at the resource.

The strategy of producing a mid-stream product also has the potential to unlock remote hard-rock assets globally that have challenges such as long distances to export infrastructure or customers.

Pilbara Minerals chief executive and managing director Dale Henderson is excited to be taking the next step in the company's mid-stream strategy.

"Following further studies and pilot test

work, we are delighted to be taking the next step in our mid-stream strategy with the construction and operation of a mid-stream demonstration plant with our joint venture partner Calix," he said.

"The mid-stream strategy has potential to materially improve the battery materials supply chain for lithium through reduction in carbon energy intensity, reduction in transport volumes and creating more value at the mine site.

"It has the potential to be a game changer compared to the traditional spodumene to chemicals processing route."

At full production capacity, the project is estimated to produce more than 3000tpa of lithium phosphate.

As manager of the partnership, Pilbara Minerals will seek to sell all lithium phosphate produced from the demonstration plant on commercial terms. **AMR**



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(L-R) First Nation Engineering (FNE) chief executive Moses Panashe and FNE director Glen Weir.

## FIRST NATION ENGINEERING CELEBRATES FIRST CONTRACT MILESTONE

**F**irst Nation Engineering Pty Ltd (FNE) is celebrating the completion of its first contract, providing engineering design and procurement services to Northern Star Resources Ltd (ASX: NST) in relation to borefields expansions at Northern Star's Thunderbox, Carosue Dam and KCGM Operations.

FNE is a registered Supply Nation Indigenous business, an incorporated joint venture (JV) between a subsidiary of the Carey Group — Australia's leading Aboriginal commercial enterprise, with over 27 years of project delivery excellence in the mining, civil and training industries — and CPC Engineering — which began in the Goldfields more than 50 years ago and now offers end-to-end mining and infrastructure services for clients State-wide.

FNE is the first Indigenous company to offer comprehensive design, construction and maintenance services across the resources, energy, and agricultural sectors.

The JV was launched at the Diggers and Dealers conference last year.

FNE chief executive Moses Panashe says he is delighted that FNE had the opportunity to work with Northern Star.

"FNE is pleased to have partnered with Northern Star on this project," he said.

"My hope is that we will continue to work with Northern Star in the future, and that this is just the beginning.

"The other benefit is that under the terms of the JV, a percentage of profits from First Nation Engineering projects are set aside for special purpose programs such as Indigenous scholarships."

Carey Group is involved in Aboriginal training, employment, and community programs.

Northern Star's KCGM operations general manager Kous Kirsten says Northern Star is "committed to establishing sustainable supply contracts with Indigenous businesses across the company's Australian operations".

"Northern Star recognises the value Indigenous businesses create within our supply chain, and the benefits they generate for Aboriginal and Torres Strait Islander peoples, communities and local economies," Mr Kirsten said.

"Northern Star looks forward to developing many other opportunities to engage First Nation Engineering." **AMR**

## RUGBY RUN SOLAR FARM: FROM TRY LINES TO SOLAR LINES

**B**ravus' renewables powerhouse Rugby Run continues to be among Australia's top performing solar farms, as the facility approaches its fourth year of operations.

The central Queensland renewables project once again achieved a podium finish as the third-highest performing photovoltaic asset in the country in June.

Rugby Run is located near Moranbah in central Queensland and features 247,000 solar panels that generate 185,000MWh of power each year.

Bravus business manager for renewables Derek Chapman says the company is proud of the latest solid performance from Bravus' flagship solar investment in Australia.

"Rugby Run is located in one of the best sites in eastern Australia for solar generation," he said.

"Achieving this level of consistency of output highlights what a great generation project it is."

Since starting operations, Rugby Run has consistently rated in the top three best performing solar farms in Australia, with industry analysts Rystad Energy rating it the second-best performing solar farm in 2021 and again in 2022.

Rugby Run was also Queensland's top per-

forming utility scale PV facility in 2021 and 2022.

It provided the equivalent energy to power around 23,000 regional Queensland homes and businesses in each of those years.

The ratings look at the capacity utilisation factor for each solar farm, the ratio of the actual energy generated by the project over a year to the energy output at its rated capacity.

The 65MW Rugby Run has consistently achieved capacity utilisation factors of above 28% in the past two years (2021, 2022).

This has been achieved by its design, in

which the solar panels are programmed to rotate to track the sun for maximum energy efficiency and rest at an angle that withstands inclement wind and weather conditions.

In Queensland, Rugby Run has a power purchase agreement to sell 100% of the renewable energy generated and also supplies to the National Electricity Market, which helps to provide cheaper and more sustainable energy to customers and Queenslanders.

As part of the Adani Group, Bravus has benefited from the Group's experience as the world's largest multinational solar energy company.

Rugby Run is part of the Adani Group's

vision to create a sustainable energy mix through significant investments in renewables.

Adani Green Energy Ltd (AGEL) is one of the largest renewable energy companies in India with a current project portfolio of 20,434 MW.

The company develops, builds, owns, operates, and maintains utility-scale grid-connected solar and wind farm projects.

GEL recently release its Q1 FY24 results which showed operational capacity up 43% and EBITDA from the supply of renewable energy up 53%.

### Rugby Run technical details

- 65MW solar farm
- More than 247,000 solar panels installed
  - o The solar panels rotate to track the sun and maximize efficiency
  - o The solar panels are programmed to rest at an angle that withstands inclement wind and weather conditions
- 175 jobs at peak construction
- 1.3m galvanized zip ties used in the stringing of electrical cables
- 18km of fence line installed
- 7.2km of road built to access site
- 6,500 holes pre-drilled

**AMR**



Birds-eye view of the Bravus' solar farm Rugby Run in central Queensland.



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From concept to completion, Kanyana Engineering delivers high-quality precision metalworking solutions to meet the required applications in the commercial, industrial, mining and defence industries.

For over 25 years, the Western Australian metalworking business has built a reputation as a specialist in laser cutting, bending, and metal fabrication.

As an Original Equipment Manufacturer (OEM), Kanyana has established a strong

presence across Australia's west coast, particularly in response to the diverse requirements of mining operations.

Kanyana utilises cutting-edge fiber laser cutting technology, which allows the team to achieve remarkable tolerances of 0.2mm, cut sheet sizes of up to 70mm thickness, and sheet sizes of up to 6,000mm x 2,500mm. This expanded cutting capability has launched the business company into the realms of aerospace, shipbuilding, large-scale mining manufacturing, where precision components and accuracy are of utmost importance.

"We take great pride in our ability to deliver clean, burr-free edges and achieve intricate designs and complex shapes with absolute precision," said Kanyana Engineering Director, Graham Dawe.

"Aside from laser cutting, we provide metal bending services using advanced bending equipment with robotic features and techniques. This enables us to achieve accurate bends and angles, ensuring the highest level of accuracy in our final products.

Our fabrication capabilities allow us to assemble and weld metal components to create finished products or sub-assemblies that meet customer specifications and stringent quality standards."

Mr Dawe emphasised the need to work closely with clients and truly understand their industry and commercial applications, then devise a customised solution that aligns to their needs.

"Our commitment to excellence, advanced

machinery, and skilled workforce have earned us a strong reputation in the industries we serve.

"What sets us apart in the local manufacturing industry is our ability to implement comprehensive Industry 4.0 documentation and tracking systems throughout the entire manufacturing process. We recognise the importance of data-driven operations and have embraced the Industry 4.0 principles to enhance efficiency, productivity, and quality control. This is demonstrated by our proven track record and versatility, including successful collaboration in flagship mining and defence projects, where we have supplied critical parts." **AMR**

For more information, visit <https://kanyanaengineering.com.au/>



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(Image source: Curtin University) Students at Curtin University.

# BHP AND CURTIN UNIVERSITY TEAM UP FOR WA SCHOLARSHIPS

**B**HP (ASX:BHP) and Curtin University have teamed up to help students across WA with their tertiary education journeys.

BHP has designed scholarships to give students from their host communities in the Pilbara and Goldfields regions first preference when applying for the funding.

The scholarships will provide recipients with financial aid, mentorship, fourth year research project support and visits to mining operations.

Fields of study include mining engineering and metallurgy, with dedicated opportunities available for women and Indigenous students interested in studying these fields.

BHP head of corporate affairs in WA Meath Hammond says the company is excited to work with Curtin University to provide the scholarships.

"Scholarships are an important part of rewarding academic excellence, supporting research and enabling students from all

backgrounds to realise their potential," he said.

"We are very pleased to be working with Curtin to make these scholarships available, particularly with the focus on the regional communities where we operate."

BHP and Curtin first joined forces in 2020 to develop research and innovation projects and support the higher education of emerging leaders.

The partnership is based on a shared com-

mitment to innovation, technology, sustainability and preparing students for the jobs of the future.

As well as the scholarships, the BHP and Curtin partnership also includes alumni programs, support access to education from remote areas, internships, work-integrated learning opportunities, research initiatives, work-integrated learning opportunities and community programs. **AMR**

## JUMP IN MINING APPRENTICES AND TRAINEES BY 19%

**N**ew data shows the number of apprentices and trainees in the Australian mining industry increased 19% in 2022, according to the National Centre for Vocational Education Research (NCVER).

The figures confirmed 7,689 apprentices and trainees joined the mining workforce in 2022, which included a 14% increase in Aboriginal and Torres Strait Islander people and a 26% jump for women compared to 2021.

Minerals Council of Australia chief exec-

utive Tania Constable says apprenticeships and traineeships are an important pathway into the minerals industry, with high demand for qualified tradespeople in highly paid and secure jobs.

"The mining industry has for decades invested in collaborative partnerships such as developing tailored work readiness, apprenticeship and traineeship, cadetship and recruitment pathways," she said.

"The growth in female apprentices and trainees reflects the industry's commitment to increasing the representation of

women across the workforce, a trend that must continue.

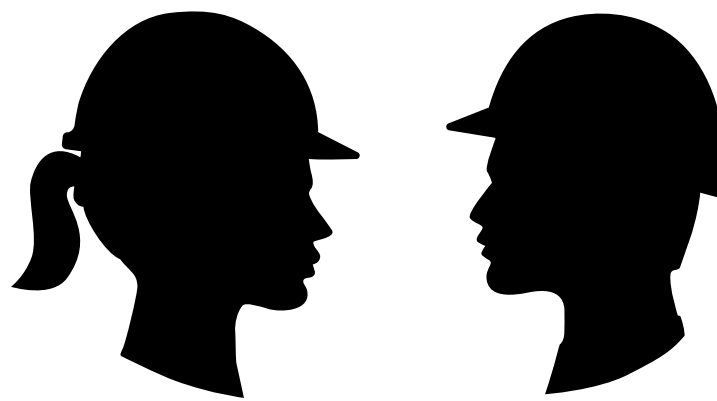
"Apprentices gain skills for life and the demand for skilled workers is forecast to increase, with Australian mining investing billions in adopting the latest technology to improve safety, productivity and decarbonise."

Ms Constable calls for policy settings to be changed to encourage new employment opportunities for more Australia.

"The Federal Government's 'Same Job,

Same Pay' proposed legislation would severely impact the Australian mining industry's ability to employ more apprentices, due to the requirement to pay them the same as more experienced workers who are directly employed," she said.

"Instead of making the industry more competitive and attractive for investment, the Federal Government's proposed legislation would be a handbrake on mining wages, investment and jobs growth." **AMR**





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## STANWELL PARTNERS UP TO PROVIDE FREE COURSE FUELLING QUEENSLAND'S HYDROGEN FUTURE

**M**eandu coal mine owner and Central Queensland hydrogen (CQ-H<sub>2</sub>) project consortium partner, Stanwell Corporation, has teamed up with CQUniversity (CQU) and ACCIONA Energía to develop online learning programs for Queensland secondary school students focused on the State's hydrogen and renewable energy sectors.

The new free courses, under the umbrella name *Fuelling a hydrogen future: STEM Skills for Secondary Learning*, have been developed in partnership with the Queensland Government for Years 7-12 and aim to build industry-school connections.

Queensland Training and Skills Development Minister Di Farmer says the Queensland Government is investing in the younger generation through the expansion of its Gateway to Industry Skills Program (GISP), which will now include hydrogen.

"Hydrogen GISP captures more than 2000 students across 32 Queensland schools over three years," she said.

"Now we have gone one step further with online opportunities.

"I'm pleased to see this partnership come together between the Queensland Government and CQUniversity to provide our students with more learning opportunities which could lead to better career options, particularly in emerging industries."

Stanwell chief executive Michael O'Rourke says the company is committed to working with industry partners across a variety of sectors to help drive the development of Queensland's hydrogen industry and the use of other new technologies.

"We know the workforce of tomorrow is in the classroom today," he said.

"Through collaboration with partners like CQU, we are able to leverage our expertise and help create learning pathways for the energy sector leaders of the future."

ACCIONA Energía general manager of brand and marketing Caroline Bommers says this collaboration allows young peo-

ple to get a foot in the door in a rapidly growing industry.

"Without renewables there is no green hydrogen and without people there's no renewables," she said.

"Programs like these are a step towards getting the workforce that will be needed for the energy transition and capitalising on our green hydrogen opportunity.

"The opportunities for students to undertake these courses can set them on the path for a long-term and secure career in the emerging industry."

In May this year, Stanwell Corporation announced a new milestone for Queensland's largest renewable hydrogen project in Gladstone.

The company, along with other CQ-H<sub>2</sub> project consortium partners, commenced the front-end engineering design (FEED) study for the project.

Working with Japanese foundation companies Iwatani Corporation, Kansai Electric

Power Company and Marubeni, as well as Singapore-headquartered Keppel Infrastructure, this project represents the largest investment in an Australian renewable hydrogen project of its kind to-date.

The commitment of \$117m from government and consortium partners will enable the project to develop a hydrogen production facility, hydrogen gas pipeline and hydrogen liquefaction facility, including the supply of hydrogen to an ammonia production facility.

Mr O'Rourke says the company is "proud to be leading the CQ-H<sub>2</sub> project with [its] partners, which demonstrates [the] commitment to driving the development of Queensland's hydrogen industry and other new technologies".

The project aims to deliver renewable hydrogen via its different carriers, to Japan and Singapore, as well as supplying large domestic customers in Central Queensland.

Commercial operations are planned to commence from 2028. **AMR**





# EXPLORATION UNDERWAY FOR LITHIUM HARD ROCK MINERALISATION



Pilbara region of WA.

Exploration is underway for significant new areas of lithium hard rock mineralisation in the heart of the Pilbara lithium province of WA.

Based on recent success in neighbouring areas, the Pilbara has been reaffirmed as the prime location for hard rock lithium discoveries.

Multiple pegmatites were identified and sampled to the west and south of QX Resources' (ASX: QXR) Western Shaw leases with numerous pegmatites returning encouraging lithium results from mobile XRF analysis.

QX Resources is undertaking surface rock chip sampling and mapping across outcropping pegmatites. The key target is the contact zone between greenstones and granitoids known to be permissive for lithium mineralisation.

Additionally, detailed high resolution air-

borne geophysics is scheduled over the next two weeks for the Turner River project which has an identified significant lithium mineralisation halo.

QXR managing director Steve Promnitz commented on the exploration.

"Multiple new targets are being generated with initial work yielding encouraging results, especially around identified pegmatites," he said.

"The Pilbara continues to be reaffirmed as the prime location globally for major lithium hard rock discoveries and QXR hold favourable ground in the heart of the Pilbara. We are keen to advance exploration promptly."

Once initial sample results have been confirmed, extensive trenching and sampling will occur across new areas of interest. **AMR**

## DRILLING PROGRAM BEGINS AT BLACK CAT

A 7000m reverse circulation drilling program has begun at Kairos Minerals' (ASX: KAI) Black Cat lithium prospect within the Roe Hills project in WA.

The Roe Hills project lies within a newly developing spodumene-bearing pegmatite province that hosts the Manna lithium-tantalum project which has a mineral resource of 36Mt at 1.13% lithium oxide.

Up to 76 holes will be drilled with 39 planned to test the 2.8km-long Black Cat lithium-caesium-beryllium-tin anomaly which measures up to 300m wide. A further 12 holes will be drilled along strike of the Crystal Palace anomaly.

If pegmatites are intersected, 13 drill pads to be prepared at Black Cat for immediate infill drilling.

Several other compelling targets will be

drilled after Black Cat and Crystal Palace, including the new Blue Jay rare earth anomaly and the Black Cat gold target.

Managing director Dr Peter Turner commented on the drilling program.

"The technical work we have done shows Black Cat is an extremely compelling target. It is a Manna look-alike, it is northeast striking and is characterised by a similar multi-element association," he said.

"With the multi-element soil geochemistry indicating potential lithium pegmatites beneath Black Cat and Crystal Palace, the reverse circulation drilling will provide a good understanding of subsurface geology, mineralogy and lithium grades."

The 76-hole drilling program will take roughly two weeks to complete and is fully funded. **AMR**



(Image source: Kairos Minerals)  
Reverse circulation drilling rig at the Black Cat lithium target.

## LITHIUM UNIVERSE BEGINS TRADING ON ASX

The ASX welcomed Lithium Universe (ASX:LU7) to its ranks on August 14th, 2023, after an oversubscribed public offer of \$4.5m.

Spearheaded by lithium pioneer Iggy Tan, Lithium Universe's mission is to obtain a resource and construct a spodumene-producing mine in Quebec, Canada.

The company holds the Lefroy lithium and Voyager rare earth projects in Australia, as well as the Margot, Apollo, Adina West and Adina South lithium projects in Canada.

Lithium Universe's initial focus will be to fast-track the exploration and associated development of Apollo.

Apollo comprises 466 claims covering an area of around 240km<sup>2</sup> in the Eeyou Istchee Baie-James Municipality.

It lies roughly 29km south of Patriot Battery Metals' Corvette property which hit a remarkable 156m at 2.12% lithium oxide and 28km west of Winsome Resources' Adina project which has hit 107m at 1.34% lithium oxide.

Given the exceptional results from these neighbouring projects, Apollo has the potential to be equally successful.

Non-executive chairman Iggy Tan is pleased to list on the ASX.

"We are pleased to complete the re-listing process and commence trading on the ASX," he said.

"My vision for LU7 is to establish ourselves as a prominent lithium project builder by prioritising swift and successful

exploration and development of lithium projects, instead of exploring for the sake of exploration." **AMR**



Electronic display of the ASX.





# EX-MINER DOMINATES HOTSHOT INDUSTRY FOR WA MINING, OIL & GAS

**H**armon Transportation was founded with a simple yet ambitious goal: to provide reliable and efficient transportation services to the Australian mining industry.

As a former miner himself, founder Paul Harmon understood the importance of timely and dependable deliveries in keeping mining operations running smoothly.

With this vision in mind, Paul set out to establish a company that would deliver on its promises, and, through sheer determination and a commitment to excellence, he has built a thriving business that has become the go-to provider for hotshot transportation services in WA's mining industry.

Available any time of the day or night, 365 days a year, Harmon Transportation keeps your mine operating.

With its expanding fleet ranging from 1t utes to 8t trucks – operations won't be hampered while you're waiting for a part.

For interstate and urgent deliveries, Harmon Transportation can also provide air freight hotshots.

At the heart of Harmon Transportation's success is a simple strategy: do what you say you will do.

This means understanding the needs of the mining industry and being aware of the urgency and cost of downtime.

To ensure timely deliveries, the company uses only its own fleet of vehicles, which are wrapped in bright yellow with the company logo.

Harmon Transportation Chief Executive Paul Harmon describes the company's vehicles as "beacons of light."

"When our clients see our bright yellow vehicles, they know they can count on us to deliver on our promises," he said.

"We take pride in our vehicles being reliable and recognisable, and they serve as a symbol of our commitment to providing exceptional service to our clients."

In addition to providing leading transportation services, Harmon Transportation is committed to giving back to the community which has supported them.

Led by Paul and his team, the company donates a percentage to The Pantry, a not-for-profit organisation that provides food and other essentials to those in need.

Harmon Transportation also supports local Aboriginal communities and schools by providing essential items.

This dedication to community support is an outworking of the company's values of reliability, urgency and social responsibility.

Harmon Transportation's remarkable success story is a testament to the hard work and determination of this family business.

With a deep understanding of the mining industry and its needs, Paul Harmon has built a company that not only provides reliable and efficient transportation services but also gives back to the community.

Starting with just one ute 15 months ago, the company has grown to service over 20 clients throughout WA, stretching up to the Pilbara and across Port Hedland.

As the mining industry continues to grow, companies like Harmon Transportation will be essential in ensuring smooth operations and reducing costly downtime.



## GUARANTEED DELIVERY TO YOUR SITE WITHIN 24 HRS FROM PICK-UP

**HARMON TRANSPORTATION's point of difference is the use of 1t utes up to 8t trucks along with air freight hotshots.**

**TIME IS MONEY.** The efficiency of the smaller vehicles accessing pick-up points and loading your cargo allows for your cargo to be picked up within the hour and on the road ASAP, saving you money in downtime costs.

**The industry-leading 3-step process "ORDER-TRANSPORT-RECEIVE"** simplifies the job which sets Harmon Transportation apart from the rest. If you need it fast, get in touch.

**PAUL HARMON: 0456 198 939**  
EMAIL: paul@harmontransportation.com.au

**EMERGENCY HOTSHOTS:  
AFTER HOURS: 0431 497 638**



**SERVING THE WA AND INTERSTATE MINING, OIL & GAS INDUSTRY**



# MINING INNOVATION ROADSHOW

EMBRACING INNOVATION  
AND COLLABORATION FOR A  
SUSTAINABLE FUTURE



(Image source: Austmine) The 2022 Brisbane Mining Innovation Roadshow.

**A**ustmine's Mining Innovation Roadshow is heading to Perth on September 1 with the event building on the 2023 conference theme of *'Transforming Our Future'*.

Austmine's mining roadshows provide a valuable platform for the mining equipment, technology and services (METS) and mining communities to exchange ideas, foster connections and stay updated on the latest advancements in mining.

The day will host four sessions, with each focusing on a different topic.

## Session 1 — Powering the Future: Mining Leading the Energy Transition

As the world shifts towards renewable energy, the mining industry plays a crucial role in reducing its own emissions as well as providing the minerals and metals needed for these technologies.

Session one will explore how the industry can support the development of renewable energy, as well as its own transition to more sustainable energy source.

Austmine chief executive Christine Gibbs Stewart will begin the session before IGO head of technical services Chris Carr presents the opening keynote, *Beyond the Min-*

*erals: Why Mining Can Lead the Way in the Energy Transition.*

Indurad chief executive Reik Winkel will explore the advancements in mining technology and delve into the future of sustainable mining practices, while Lithium Australia chief executive Simon Linge will provide insights into to critical minerals revolution.

The session will end with a panel consisting of CarbonChain vice president of Australia and Asia Carlos Zapata, Vulcan Energy Resources founder and executive chair Dr Francis Wedin and Liebherr executive general manager, future industries project Paul Murphy.

## Session 2 — Innovation Spotlight Presentations

The spotlight presentations will provide an opportunity for Austmine members to showcase their expertise and display new technologies in mining.

These presentations will highlight mining challenges through innovation in the digital age, the potential of machine learning and artificial intelligence, sustainable autonomous haulage solutions and the potential of automation in a mineralogy workflow.

Guests can hear from PETRA Data Science head of technical business development Jordan Herrmann, Orion Satellite Systems head of commercial Dave Townsend and Portable Spectral Services senior spectral geoscientist Jack van der Pal.

## Session 3 — Securing the Future: Leveraging the Digital Age

As mineral reserves become scarcer and demand continues to grow, session three will explore how digital technologies are contributing to the industry's overall sustainability, including areas such as people management, exploration and waste reduction.

Roy Hill chief operating officer Anthony Kirke will share insights into the company's evolution towards an autonomous mine and Fleet Space Technologies senior enterprise account executive Richard Rowe will present on the company's innovative technology that accelerates the process of mineral discovery.

A panel will then explore how automation and artificial intelligence are changing the nature of work.

## Session 4 — Beyond the Horizon: The Innovation Frontier

The fourth and final session will explore

the exciting possibilities that emerge when innovation and safety combine to transform industries.

It will dive into the intersection of the space and resources sectors, shedding light on the untapped opportunities for collaboration.

RPMGlobal product manager of simulation and operational management Adam Price will discuss the challenges surrounding decarbonising mine haulage fleets and Weir ESCO general manager advanced technology Rod Clarke will present on the award-winning collaboration project between Rio Tinto and Weir ESCO.

This partnership has resulted in the development of a cutting-edge semi-automated operation for handling and changing ground engaging tools.

The session will end with a journey from the present into the mining landscape of 2035.

Kopernicus Inc chief executive Mike Kyriacou will unpack the trends in energy, robotics, artificial intelligence, 3D printing, advanced materials and quantum computing. **AMR**

## WA GOVERNMENT LAUNCHES NEW ANTI-HARASSMENT PROGRAMS

**T**he WA Government has launched two programs as part of a strategy to create safer workplaces and drive cultural change within WA's resources sector.

The SPEAK UP, REPORT IT campaign will reinforce the message that harassment and bullying in the resources sector is unacceptable.

It will remind senior executives, mine operators and workers of their responsibility to report workplace sexual harassment and other inappropriate behaviours towards women to WorkSafe.

WorkSafe's 24/7 hotline, where callers can remain anonymous, has been bolstered for victims and bystanders of workplace harassment or bullying.

The number, 1800 678 198, is also used for

reporting other mines safety incidents. A further two staff have been employed to triage incoming calls and WorkSafe has delivered specialised training to ensure the service is provided in a trauma-informed manner.

WA Industrial Relations Minister Bill Johnston commented on the campaign.

"The SPEAK UP, REPORT IT campaign highlights to WA Government's ongoing commitment to promote workplace cultures that support inclusivity, respect and safety," he said.

"We all have a responsibility to speak out against sexual harassment and other unacceptable workplace behaviours.

"It is vital there is a clear point of contact for those that experience sexual harassment at work.

"Sexual harassment is a work health and safety issue and we must confront it."

Today, the *Respect in Mining* program was also launched to increase awareness and knowledge of the impact of gender inequality on women's safety and the impact of gendered division in leadership within the resources sector.

Scheduled to begin early 2024, Gold Fields Australia will participate in a 12-month pilot program across its WA operations.

Curtin University's Collaboration for Evidence, Research and Impact in Public Health undertook research and development and created a suite of tools and resources for use in the pilot.

These tools provide guidance on how to review the new policies and procedures

as well as monitor the overall shift in workplace culture to improve practice.

WA Women's Interests Minister Sue Ellery says this program will stamp out unacceptable behaviour.

"Everyone has a right to feel safe and supported at work," she said.

"Workplace sexual harassment is not a women's issue — it is a societal issue that all organisation, employers and individuals have a responsibility to address," she said.

"I am pleased the Gold Fields Australia have agreed to pilot the *Respect in Mining* program and work with us to drive cultural change and help stamp out unacceptable behaviour." **AMR**





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# IN THE SPOTLIGHT

## K2fly Chief Executive Nic Pollock on Resource Governance Solutions

K2fly listed on the ASX in November 2016 with the ticker code K2F after making a pivot to consulting as a natural progression from selling governance software.

The company works in cloud-first software-as-a-service and provides 10 resource governance and technical assurance software solutions.

With mining major such as Rio Tinto, Roy Hill, South32, Newmont, Glencore, Fortescue Metal Group, Newcrest and AngloGoldAshanti as clients, K2fly's solutions address challenges in the mining industry and help manage risks around its clients' social licence in environmental, social and governance (ESG) compliance.

**AMR: How do you approach innovation and technological advancements within the software and mining industry?**

**NP:** One of our key advancements is that we invest in an industry team. In that team, we have some extremely high-end and experienced individuals responsible for determining what it is we have today, where the market is heading, measuring our progress against the total addressable market and providing a vision and strategy across our product offering.

K2fly uses a bowling alley strategy, where we start with one head pin and then from that create a knock-on effect to strike the others. For us, this means starting with the mining industry, specifically Resource Disclosure, and once that head pin is knocked over, we can work other angles, whether that be other solutions or other industries like agriculture and utilities. We utilise the industry team to define and give data for these decisions and then we decide if we need to build it ourselves, buy it, partner with someone, or even a combination of them all. The decisions we make are data lead and it has to be driven by what our customer base is telling us.

**AMR: What insights can you give about the mining industry and its future with technology?**

**NP:** We're of the belief of serving the industry first, so we assess what problem do they have that needs to be solved, and

how do we use technology to do that, not the other way around. A lot of tech businesses in this industry can sometimes be a hammer looking for a nail that suits their hammer, where the hammer in this scenario is their solution and the nail is someone's problem.

K2fly on the other hand would prefer to find the nail first and then create the hammer to solve the problem. The mining industry is going through a phase where it's quite mature from a technology perspective, but one of the problems the mining industry is facing right now is around ESG, disclosure and licence to operate and how technology can help facilitate this.

Any survey will tell you that these things are within the top one, two or three things that boards or chief executives are concerned about in this market, so we're about to see a lot of change in this space. Managing responsibilities across community expectations and official regulations is a major issue, and K2fly is right at the forefront of solving it.

**AMR: Can you talk about your work with large cap companies such as Rio Tinto, Roy Hill and Fortescue and why do you think they work with you?**

**NP:** K2fly and Rio Tinto have enjoyed a successful partnership since 2019. Rio utilises five K2fly solutions across our Mineral Resource and Natural Resource Governance

suites, including corporate functions and iron ore operations in the Pilbara. The collaboration began with the adoption of our Mineral Resource Governance solution in 2019, replacing an in-house system for reporting mineral resources and reserves to investors and regulators.

This partnership has expanded to encompass our global Reconciliation module and Tailings management system for global tailings facilities reporting under GISTM codes.

Since K2fly's acquisition of Infoscope in 2018, FMG and K2fly have collaboratively developed the Natural Resource Governance suite, with a focus on integrated Land Access, Ground Disturbance, and Heritage functions.

At the end of the day, no one else is offering what we are offering, we work in a space that's high value with no competition, and that's why the big miners work with us. In the modern era, communication is faster than it has ever been which means there's a huge risk for miners when things go wrong, no matter where in the world you are.

Miners need to be on top of their environmental, social and governance, otherwise they risk multi-billions of dollars in investor funds being damaged. Providing systems that protect against these sorts of things is why these companies work with K2fly.



K2fly Chief Executive Nic Pollock.

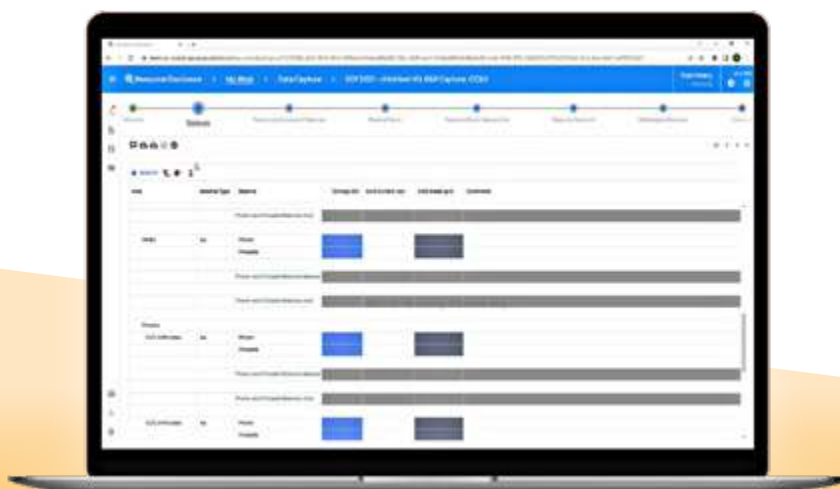
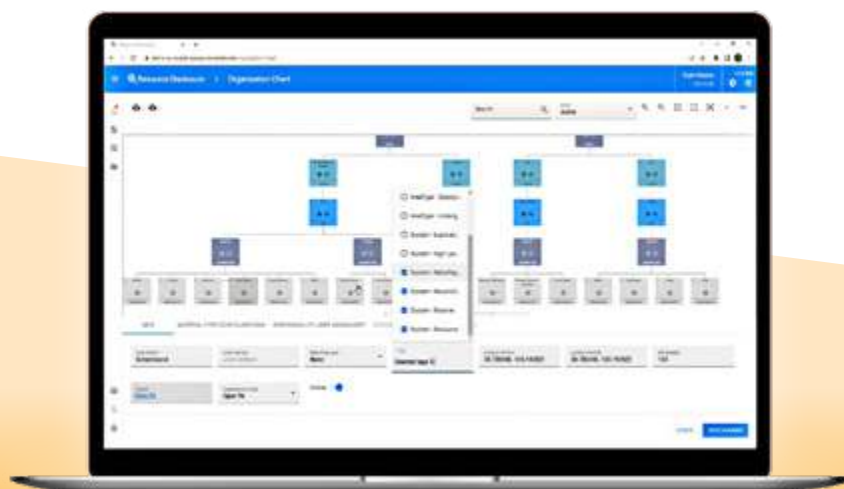
**AMR: What does the future look like for K2fly and do you have anything exciting coming up you can share with us?**

**NP:** The future looks great for K2fly. There will always be global uncertainty, but we feel that our chosen markets are inherently very strong, and we have huge demand for mining and mining projects. Fundamentally, in order to serve renewable energy transition, there will need to be more mining. The last calculations that I saw indicated that we would need over 300 new mines to build these resources and facilities. Only mining can solve this, but mining has to be done better.

That macro hasn't changed, and it will only get stronger as the world supports energy transition. That's why I think our future looks very bright. We believe that a key part of the success of renewable energy and mining is resource governance.

Those who have tenure of land and mineral endowment must have a responsibility to everybody to mine properly and be conscious of the entire community, from traditional owners, the environment, local communities and other property owners.

Miners need to try and change the reputation of mining from something that has been largely a negative to hopefully positive. We're building to help our customers through energy transition and do a better job managing their responsibilities. **AMR**



K2fly's most prominent solution, the Resource Disclosure Solution.

(Image source: K2fly)



## COMPREHENSIVE IP ENCLOSURES



**M**FB's S280 range of enclosures are built tough. Mining environments can be unpredictable and as a result ensuring your equipment and servers are safe is imperative to operations.

Boasting an extensive range of widths, depths, and heights, our fully welded enclosures provide essential IP (Ingress Protection) attributes.

MFB'S S280 Industrials, are third party accredited and conform to AS 60529:2004 - Degrees of Protection provided by an enclosure.

At minimum, they meet IP54, where 5 = dust protected, limited ingress; and 4 = protected against water splashed from all directions with limited ingress.

MFB S280 enclosures can offer up to IP66, where 6 = dust tight, 6 = water projected shall not enter the enclosure.

With bespoke and custom specifications being increasingly important, MFB provides open lines of communication throughout the design and manufacturing process.

Our team of experienced designers run Autodesk Inventor and can create 3D models that allow checking for interference at the modelling stage before converting to production drawings.

Take your enclosure requirements to the next level like this custom ruggedized S280 we made for a client, boasting such features as a weather hood, integrated sunshields, and provisions for one of our Seifert active air conditioners.

Seifert being our preferred supplier of both indoor and outdoor rated air-cons and Peltier thermoelectric cooling systems.

Enclosures are available in either mild steel with a customer choice of powder coat finishes, or in 316 grade finished stainless steel.

Need simpler airflow? Customers can utilise our passive fans and filters to maintain ambient airflow conditions in and out of the rack.

The next time you are looking for an enclosure built to handle all weather and aggressive environmental conditions, then look no further than **MFB's Australian Made, S280 IP Enclosures. AMR**



**LEARN MORE**

IP66 Rated

Built Tough

Secure

Customisable

## WEATHERPROOF OUTDOOR ENCLOSURES

**MFB have an extensive range of Outdoor enclosures suitable for harsh and unforgiving environments.**

Rated to IP66 dust and moisture specification the MFB's S280 Industrial range is an enclosure designed for harsh or tough industrial and outdoor environments. MFB can produce custom build enclosures to your specific needs from cable entry ports, special size enclosures, wall mount applications, cooling, fans, louvers, sun shades or insulation. It also can be fabricated in high grade stainless steel for added protection from the elements.





More than 120 suppliers will be on display in the exhibition, including Epiroc who are this year's conference sponsor.

# WA MINING CONFERENCE & EXHIBITION

## RETURNS TO PERTH THIS OCTOBER

**A**fter a successful event last year attracting thousands of attendees, WA Mining Conference & Exhibition is set to return to Perth on 11-12 October 2023, with its comprehensive conference program and line-up of expert speakers who will share their perspectives on opportunities facing the industry.

It's no secret that Western Australia leads the country's mining industry in terms of technology and innovation, and WA Mining aims to showcase the technical and digital evolution transforming industry in WA. This year's event builds on the success of the 2022 conference and exhibition, with quality companies already lining up to attend.

The event features a ticketed conference for thought leaders, industry and academia, running alongside the free-to-attend exhibition at the Perth Convention and Exhibition Centre. The conference's themes cover critical minerals, technical innovation, decarbonisation and ESG, industry outlook, and managing digital risk. As the conference program takes shape, conference sponsor Epiroc says it's an important event for industry, tech experts and site personnel to get involved with.

"The world needs metals and minerals for the energy transition, and we need cities that can cope with a growing population in a sustainable way. To succeed, we need to speed up the shift towards a more sustainable mining and construction industry. We at Epiroc accelerate this transformation," said an Epiroc spokesperson.

**Spread over two days, the paid conference agenda includes sessions such as:**

- The future of Australian mining sector
- Mine site operation on 100% renewable energy
- Navigating complex transformation

with people, technology, and processes

- Reducing hydrocarbon usage in mining maintenance through predictive analytics and cleanliness programs
- Optimising pit to port operations with AI-powered orebody learning technology
- It's not mine closure: Is it time for us to rethink the model?
- Enhancing cybersecurity in mining operations
- Advancing mine site electrification

**In addition, there'll be a number of panel discussions including:**

- Accelerating decarbonisation in the mining industry
- Critical minerals: Powering the energy transition
- Technologies and innovation shaping the future of mining
- Boosting collaborative innovation
- Managing third-party cyber risk
- Harnessing green energy: Lithium vs Hydrogen

**This year's conference presenters and panellists include:**

- Hon Bill Johnston MLA, Minister for Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations, WA Government
- Rebecca Tomkinson, Chief Executive Officer, The Chamber of Minerals and Energy of Western
- Dominic Da Cruz, Executive ESG & Stakeholder Engagement, Zenith Energy
- Ruth Kennedy, Marketing Coordinator, Zenith Energy
- Sarah Coleman, Chief Executive Officer & President, idoba
- Aira Carrero, Principal Hydrocarbon Management, Fixed Plant and Heavy Mobile Equipment, Rio Tinto
- Dr Francis Wedin, Executive Chairman,

Vulcan Energy Resources

- David Parker, Executive Director – Western Australia, Minerals Council of Australia
- Peta Chirgwin, Chief Executive Officer, Chameleon Mettle Group
- Lisa Harwood, Director, State of Play
- Andrew Bailey, CEO, MinEx CRC
- Jacqui Coombes, Chief Executive Officer, Amira Global
- Jordan Herrmann, Head of Sales, PETRA Data Science
- Dr Guy Boggs, Chief Executive Officer, Cooperative Research Centre for Transformations in Mining Economies
- Sameera Bandara, Head of Information Technology, St Barbara

On the expanded expo floor, exhibitors will put their solutions into the spotlight, sharing technical and digital progress that is transforming the way industry operates. More than 120 suppliers will be on display, including Acubis Technologies, business nbn®, IFM Efector, Knorr-Bremse Australia and Simoco Wireless Solutions. New at WA Mining Conference is the Decarbonisation Zone featuring smart and sustainable solutions that meet the sector's environmental, social, and governance (ESG) obligations. The Decarbonisation Zone is supported by International Copper Association Australia.

This year's exhibition is complemented by a free-to-attend seminar series, further encouraging the sharing of knowledge in the industry. Seminar sessions, presented by Adobe, will run throughout the exhibition, with several leading tech companies encouraging robust discussions.

WA Mining Conference and Exhibition is shaping up to be a must-attend event and sourcing platform for Australian industry, where technical and digital innovation meets operational and executional excellence.

Exhibition Director Samantha Martin is looking forward to a successful 2023 event, after last year's WA Mining Conference and Exhibition reinforced the importance of technology and innovation for the industry.

"The feedback we had after WA Mining 2022 was that the knowledge-sharing and discussion made for an extremely valuable event. Exhibitors had incredible exposure to engineers, management and industry decision-makers, and the thought leadership within the conference helped to solidify industry's contribution to a sustainable future."

WA Mining Conference and Exhibition provides a valuable opportunity for the industry to come together. The event will also feature a networking function at the end of Day 1 of the event where attendees can catch up with colleagues and peers over light refreshments.

There are three ways to attend WA Mining: a 2-day paid conference ticket, which gives full access to the conference, exhibition floor, networking events and seminar series. A 1-day conference ticket is also available with full access, and the free exhibition-only ticket allows access to everything but the conference.

WA Mining Conference and Exhibition is where technical and digital innovation meets operational and executional excellence. From the quality of speakers at the conference right through to free-to-attend exhibition, there is so much to discover. Engineers, management, consultants, technology and business optimisation specialists should have WA Mining in their calendar: 11-12 October at Perth Convention & Exhibition Centre. **AMR**

**Tickets to the event are available at [waminingexpo.com.au](http://waminingexpo.com.au).**





**11-12 October 2023**  
**Perth Convention & Exhibition Centre**

**WA Mining Conference and Exhibition** is the destination for thought-provoking content and technical and digital solutions transforming the mining industry. The high-calibre conference will explore the mining sector's evolution through technological and sustainable improvements across the entire mining value chain. Alongside the conference will be an expanded exhibition featuring over 120 leading suppliers where you can see first-hand the latest equipment and digital innovation shaping the sector.



**David Parker**

Executive Director  
Western Australia, Minerals  
Council of Australia



**Rebecca Tomkinson**

Chief Executive Officer  
The Chamber of Minerals  
and Energy of Western  
Australia



**Sarah Coleman**

Chief Executive Officer  
& President  
idoba



**Sameera Bandara**

Head of Information Technology  
St Barbara

Don't miss out on WA's leading mining event – including the new Decarbonisation Zone.

Book now at [waminingexpo.com.au](https://waminingexpo.com.au)





# SMARTTECH DOMINATING AUSTRALIA'S CIVIL AND MINING SECTORS



Sales Manager Craig Foster.

**B**eginning 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 Australia, 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."

#### WA Mining Conference & Exhibition

Find SmartTech at booth C101 at the upcoming WA Mining Conference & Exhibition that runs on October 11 and 12.

SmartTech is putting a special stand together this year, but Craig remains tight-lipped about it.

"We're putting together a very special stand this year. We had a nice one last year but we're putting together a very critical comms display which I'm sworn to secrecy on," he said.

"We're hoping to have some very good software demonstrations as well."

**For more information on Loadrite, visit [www.smarttechaustralia.com.au/](http://www.smarttechaustralia.com.au/)**

AMR



MLG Oz WA- Loadrite.



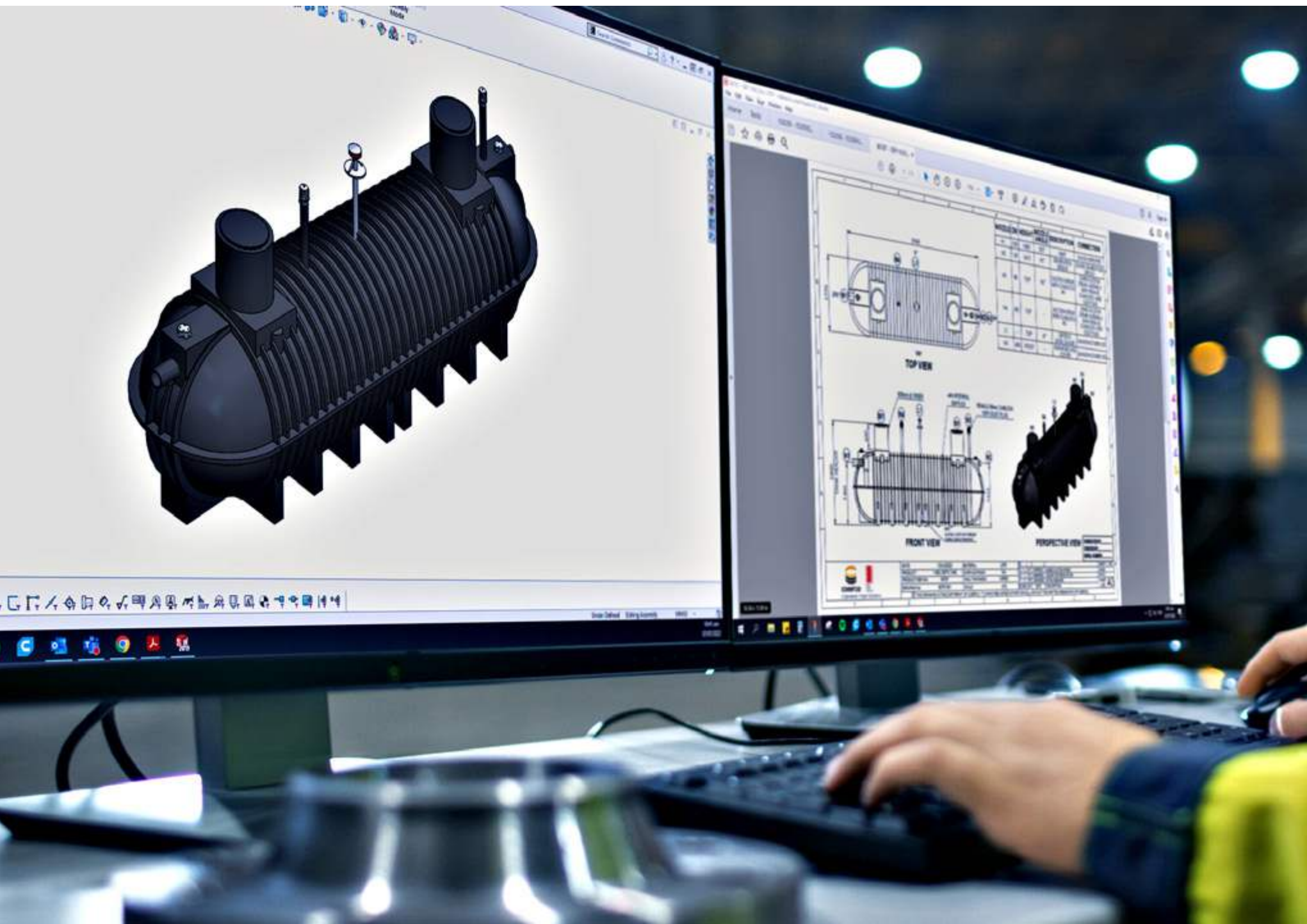


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# ENGINEERED TO OUTPERFORM

**L**iquid management in the industrial, commercial and resources space carries a high degree of unknown risk. This is something asset owners know all too well when faced with the challenges of containment, flotation and movement of water in large-scale mining operations.

It's more than just identifying the problem for a specific application, but engineering a fit-for-purpose solution that meets complex design and technical specifications under tight timeframes, and in typically remote environments with limited accessibility.

Whether it's a floating pontoon, heavy-duty access walkway, or water and diesel storage tanks, many considerations are at play in the realm of liquid management. Tackling projects of this nature demands a unique skillset, proven capability and holistic approach, all of which have been fine-tuned over a long period of time. A seasoned expert with the ability to designing, develop and deliver a practical, cost-effective solution, can help asset owners avoid unnecessary downtime and cost blowouts.

Western Australian based liquid control specialists Coerco have designed, engineered and manufactured fluid management solutions for over 30 years.

With an in-house product design and engineering team responsible for managing the end-to-end process from design to delivery, the company embraces innovative processes and cutting-edge technology in its suite of poly product solutions.

Coerco operates 11,000m<sup>2</sup> of poly manufacturing and steel fabrication facilities, which adhere to the strictest quality control, compliance and safety standards. An in-house logistics division also manages the delivery of assets directly to site, eliminating the need to source multiple vendors to successfully execute a complete project scope.

#### Reliability in an unreliable world

Coerco is a company that truly believes in the power of containment. With three key pillars – contain, float and move – Coerco offers clients the most comprehensive solution for their diverse liquid management requirements. This has strategically

positioned Coerco as the go-to partner for mining and civil engineers whose reputations rely on delivering reliable and robust solutions.

Coerco business development manager Daniel Rignall said liquid management solutions have been in the company's DNA since it started out in 1993.

"Our philosophy has always been centered around water conservation and liquid management. We understand this better than anyone and is reflected in our product design, development and delivery capability. We design and engineer solutions for individual projects that are aligned to customer specifications and give them total control of their liquid management.

"We've been in this business for 30 plus years, and not only experienced huge growth in ourselves, but diversification in the needs of our customers and how they view their liquid management."

#### A Project Pathway Designed for Success

A methodically planned project is always

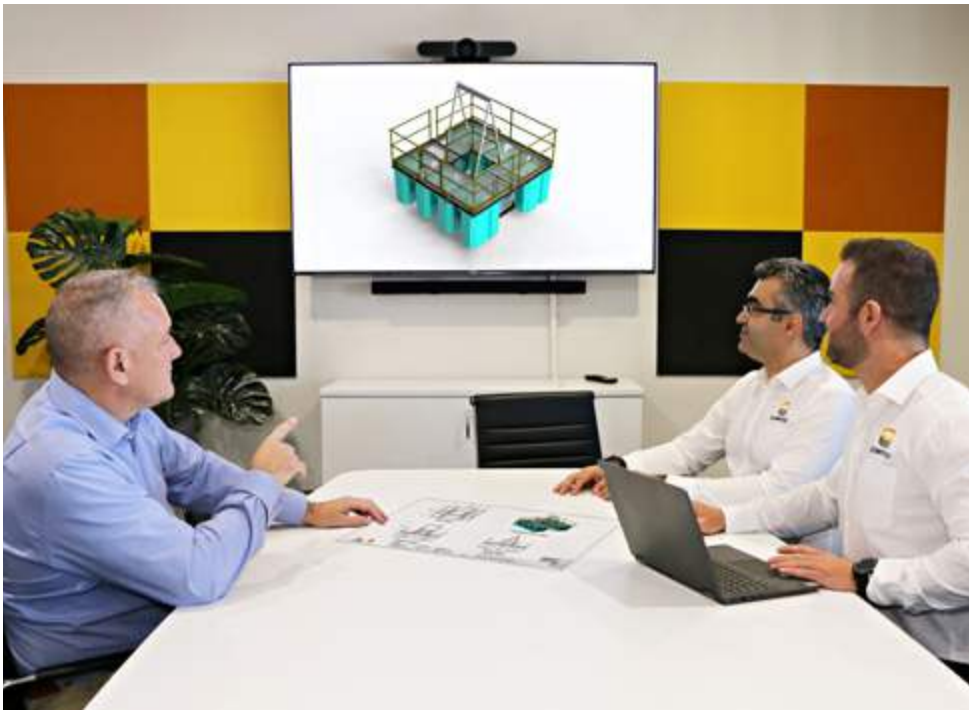
an ideal formula to achieve a successful outcome. Coerco's carefully curated delivery pathway is one that is designed to de-risk a liquid management project and help clients navigate the complexities at every step of the way.

The company applies strict planning, design, and manufacturing methodologies across their unique 'Discover, Develop, Deliver' framework, which aim to address one of three problems clients experience when it comes to a major project.

First, time pressures on design where clients are looking to save time on the design aspects of a project, so they can focus on other priorities. Second, skill gaps leading to cost and compliance and risks where an inability exists to implement a project using internal resources. Third, managing multiple suppliers that adds unnecessary time and money to the equation.

"At Coerco, there's no project too complex or technical for us, and we can engineer solutions of all scales that address any total liquid management and fluid control problem," said Rignall.





"By working with Coerco, you have a single point of contact from the design, engineering and manufacturing stage, all the way through to final delivery and commissioning."

"Our structured pathway supports significant project scopes and addresses design issues with liquid management equipment that are often left unattended until time critical junctures. We essentially developed this process to nurture our clients through the pain points they experience during project delivery."

#### Performance with Peace of Mind

A continued focus on engineering solutions that meet specifications and exceed expectations is in Coerco's blood. Its floating mining pontoons and walkways are examples of core products engineered to suit critical mining and water infrastructure projects where they support heavy pumping equipment or machinery during floating applications.

In mines where there is a need to effectively manage dam tailings, or support dewatering, sludge pond reclamation and dredging applications, modular pontoons and access walkways are an ideal solution.

Rignall says their pontoons are commonly equipped with heavy pumping equipment for miners wanting to perform de-sludging and mining pit de-watering.

"Whether it's a heavy-duty, lightweight poly, or modular setup, the type of pontoon used can be a real game changer in liquid management," he said.

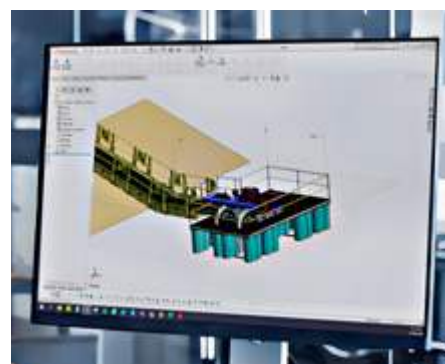
"Our pontoons provide a reliable platform when dredging pumps in high solid industrial pumping applications, whilst offering stable access walkways in remote areas during floods."

Coerco have a documented ISO 9001 certified quality management system integrated into all aspects of their operation. This ensures all products conform with relevant Australian and International standards, including all non-destructive factory acceptance testing.

A focus on innovation and quality product design have been key factors behind Coerco's success and ability to build long-term, trusted partnerships with major miners and engineering consultants around the country.

Backed by core values – care, innovate and thrive – the team is constantly pushing themselves and their capabilities to solve client challenges. Coerco is committed to investing in its people, a team that's passionate about bringing liquid management solutions to life, as well as R&D to drive product improvements.

Don't miss your chance to speak with the Coerco team at the WA Mining Conference & Exhibition in Perth on 11-12 October 2023. Visit Stand #B121 to discover more about Coerco's comprehensive liquid management solutions! **AMR**



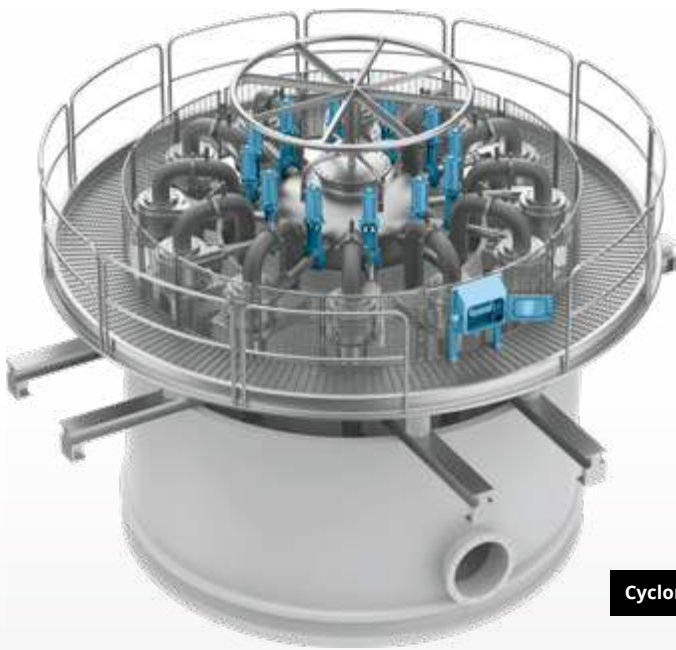


# AUTOMATING MINING & MINERALS

## Raise the productivity of your systems to a new level

### Three ways to get closer to your productivity goal:

#### FESTO



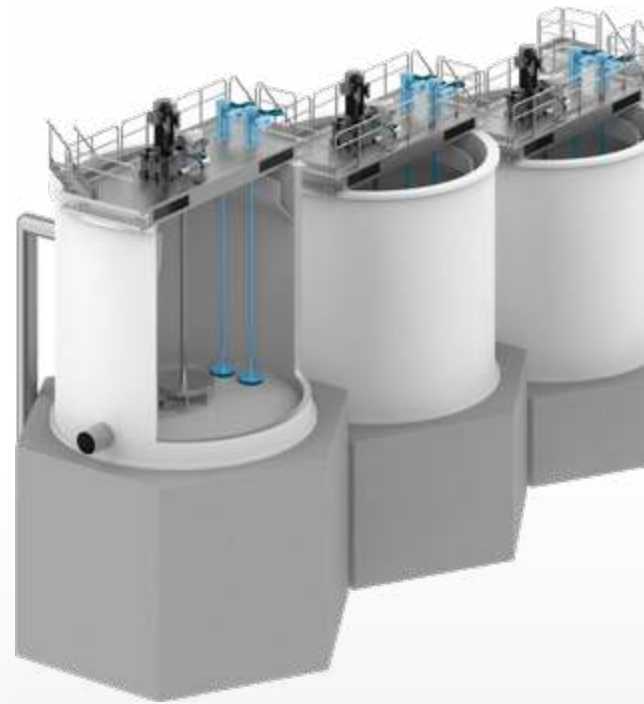
#### OPERATING HYDROCYCLONES MORE EFFICIENTLY

Valve terminals offer far-reaching advantages for the operation of hydrocyclones.

System availability increases because the valves are no longer located directly on the actuator, therefore they are outside the critical zone of vibrations, aggressive media or mechanical effects.

Troubleshooting in the control cabinet installation is significantly simplified as a result and the diagnostic capability of the valve terminal supports predictive maintenance.

Cyclone automation.



#### CONTROL CABINETS

- Fail-safe system (hold, open, close)
- Manual override options
- Ethernet I/P communication
- Remote I/O terminals



Conventional



VS

#### FESTO ACTUATORS



Precision + Accuracy in slurry level control = Recovery

## ABOUT FESTO

**Festo in Australia has been the brand name for automation solutions and a trusted technology partner to the minerals processing industry for more than 50 years.**

This forms the solid base on which its range of products for the process industry is built.

As an innovative leader within the fields of pneumatics, process, electric, fluid and motion control, Festo has the experience and the solutions to support the most demanding applications.

Festo supports customers with engineering selection, configuration, procurement, during the installation and commissioning and finally to completion ensuring a fully operational solution.

#### Worldwide

- Turnover 3.1 billion Euros
- 300,000+ customers
- 15 production locations
- Servicing 176 countries
- ISO 9001, IEC80079 34, ISO 14001

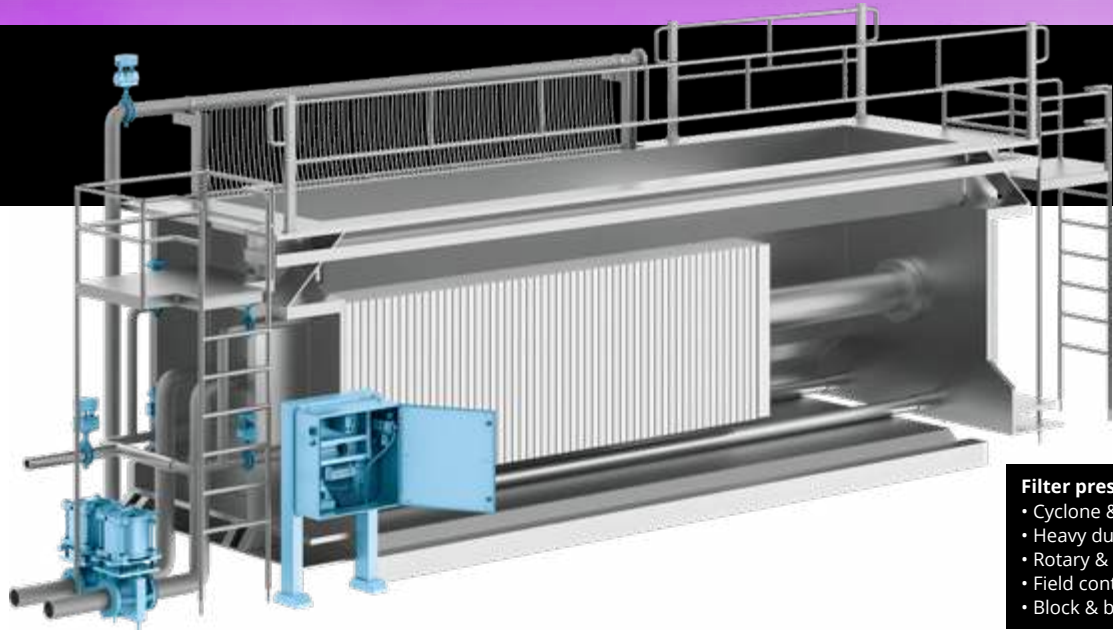
#### Australia & New Zealand

- Manufacturing & distribution facilities in Melbourne
- Offices across AU & NZ
- Technical and operational experts
- Factory trained partner network
- Global contracts & commercial management



# MINERAL PROCESSING

## new level – along the entire process chain



### MORE YIELD IN FLOTATION

The more constant the froth level, the higher the yield.

Festo's closed-loop controlled linear actuators DFPI helps achieve a very high degree of control accuracy of the dart valves and can optimally separate the fine-grained and high-quality ores from the gangue – without external attachments like displacement encoders, connectors and converters.

This solution is both insensitive to corrosion and to vibrations, significantly reducing the need for calibration and maintenance, with the relevant safety functions already integrated.

#### Flotation cell automation achieved with dart valve actuators for increased recovery

Reliable and precision slurry level control is critical to maximise mineral recovery. Festo dart valve actuators provide accurate and fine control of the dart valve to ensure optimal results.

### MAXIMUM PERFORMANCE IN FILTER PRESSES

Control and regulate process valves from a control cabinet with remote I/O valve terminal combinations – without expensive single wiring connection.

This ensures more stable processes because the control is no longer affected by harsh environmental conditions.

The process valves and process sensors supply data to the electrical terminal CPX for optimisations and predictive maintenance.

Continuous compressed air monitoring shows what potential there is for greater energy efficiency.

Festo's configurator for process valve units allows for selection of butterfly valve unit sizes quickly, easily and optimally matched to the application.

#### Filter press automation

- Cyclone & press control cabinets
- Heavy duty process valves
- Rotary & linear actuators
- Field control solenoid panels
- Block & bleed valves & panels

## Festo Capabilities for Mineral Processing Automation

Festo specialises in providing fixed price automation solutions to the global resources and mineral processing industries.

It has a proven track record of delivering integrated solutions across the globe.

Festo employs more than 100 professional, technical and support staff throughout Australia and New Zealand.

As a manufacturer, Festo supports its equipment internationally across 61 countries with over 21,000 direct personnel and a support network of factory trained official partners.

**Festo offers over 30,000 products, solutions and services including:**

- Flotation cell dart valve actuators
- Cyclone control panels and actuators
- Block and bleed panels
- Air control panels
- Air regulators & filters
- Actuated process valves
- Inline automated sampler controls
- Remote I/O terminals
- In field air solenoids
- Blast door actuators
- Cost reduction audits
- CHP air solenoid boxes
- Disc filter actuators
- Classifier actuators and controls
- Condition monitoring systems
- Pneumatic energy saving solutions
- Instrumentation purge air systems
- Pinch valve automation
- Ball mill automation
- Turnkey control panels
- Automation checks
- Automation consultants

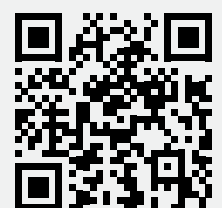
**FESTO OFFERS ROBUST AUTOMATION SOLUTIONS THAT COMBINE MAXIMUM PRODUCTIVITY WITH MAXIMUM PLANT AND SYSTEM AVAILABILITY – DIGITALISATION INCLUDED.**



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STAND D132  
during the WA Mining  
Conference & Exhibition**

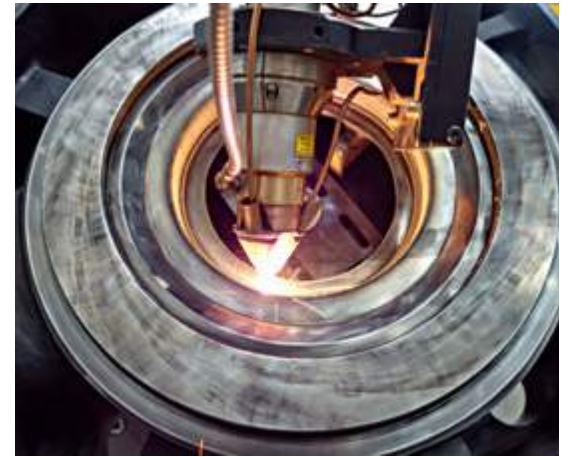


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# APEX ETG

## OPTIMISING PERFORMANCE OF MINING COMPONENTS



**A**mong the advancements transforming the mining sector, laser cladding emerges as a game-changer, and leading the charge is APEX ETG, set to showcase their groundbreaking solutions at the WA Mining Conference and Exhibition. During the two-day event at the Perth Convention and Exhibition Center on October 11 and 12, 2023, mining professionals will have the opportunity to explore how this revolutionary process promises to optimise mining operations, reduce downtime and extend the lifespan of critical components.

### What is Laser Cladding?

Laser cladding, also known as laser metal deposition, is an advanced surface engineering technique that involves applying a specially formulated coating of metal alloys onto a substrate material using a high-power laser. This process ensures precise control and layering, resulting in a strong, wear-resistant and corrosion-resistant surface. This innovation has significant benefits for the mining industry, where equipment is subjected to harsh and abrasive conditions on a daily basis.

### Enhanced Durability and Extended Equipment Life

One of the primary benefits of laser cladding for the mining sector is the substantial improvement in equipment durability and longevity. Mining machinery and components are susceptible to wear, erosion and corrosion due to constant exposure to abrasive materials and harsh environments. Through laser technology and innovation, APEX ETG enhances the wear resistance of vital components such as ground engaging tools, final drive components, hydraulics, pump parts, crushing and drilling wear parts.

### Improved Performance and Efficiency

The carefully engineered coatings created by APEX ETG are tailored to suit specific mining applications, ensuring optimal protection against impact, abrasive, erosive, corrosive and fatigue wear. With less frequent equipment breakdowns and replacements, mining operations can run smoothly and efficiently, resulting in higher productivity and reduced downtime.

### Reduced Total Cost of Ownership

APEX ETG's solutions and in-house capa-

bilities present a viable solution for mining companies of all sizes. The long-term savings in maintenance and replacement costs make laser cladding a prudent choice for forward-thinking mining enterprises.

### Sustainable Solution

APEX ETG's laser cladding not only offers practical benefits but also aligns with sustainability principles, fostering a greener mining industry. Extending equipment lifespan reduces demand for raw materials in replacements and minimises landfill waste.

Moreover, its enhanced energy efficiency compared to traditional processes results in reduced carbon emissions, collectively contributing to a more environmentally friendly mining sector.

### Improved Safety Standards

Safety is a top priority in the mining industry, and APEX ETG's laser cladding technology offers an added layer of protection for equipment operators. With laser-clad parts preventing premature component failure and unexpected breakdowns, the risk of accidents and injuries is significant-

ly reduced, creating a safer work environment for mining personnel.

### Customisation and Versatility

APEX ETG can tailor the process to suit specific mining applications, adapting materials and coatings to address specific challenges faced by mining companies. Whether it's enhancing hardness, corrosion resistance, or improving integrity, APEX ETG enables bespoke solutions that cater to individual mining needs.

### Visit APEX ETG at Booth C122

APEX ETG invites attendees to explore their expertise and insights at Booth C122 during the WA Mining Conference and Exhibition. Their team of experts will be available for in-depth discussions, offering valuable information about how laser cladding can significantly enhance mining operations, increase efficiency, and reduce costs for customers.

**For more information about APEX ETG and their pioneering laser cladding solutions, please visit [www.apexetg.com](http://www.apexetg.com) or email [info@apexetg.com](mailto:info@apexetg.com).**



**APEX**  
ENGINEERING TECHNOLOGY GROUP

**BOOTH  
C122 AT  
WAME**



**EXTEND COMPONENT LIFE WITH APEX ETG**

Visit booth C122 at the WA Mining Conference and Exhibition to explore **APEX ETG's** innovative solutions.

Discover how **APEX ETG's** enhanced durability and customisable options can optimise mining operations, improve safety, and reduce costs for your business.

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CONFERENCE AND EXHIBITION

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Booth F109

October 11 – 12



[crmining.com](http://crmining.com)



# GET OUT OF THE LINE OF FIRE WITH LIVEGAUGE

Livegauge brings products that make remote viewing of pressure, linear movement, distance and RPM easy.

Specialists in elimination of live work (ELW) equipment, their goal is to eliminate work hazards such as crush, and fluid injection injuries operators face when undertaking diagnostic testing of machinery.

## Products and Technologies

Livegauge employs the latest technologies in Bluetooth and Wi-Fi to enable remote viewing of measurements. Bluetooth technology allows for efficient and more accurate testing. Their range of measurement devices includes:

- Dial Indicators
- Transducers
- Tachometers
- Gyroscopes
- Laser Range Finders
- Inspection Robots

## Real-World Applications

Livegauge's products are for various industries, including mining, rail, plant

equipment, power generation and oil & gas. Custom kits are tailored to equip technicians for safe and efficient testing in areas such as:

- Hydraulic Pressure
- Movement Checks
- RPM Measurement
- Boom Sag & Track Testing
- Rotor Runout
- Vibration Analysis
- Crankshaft Deflection

## WA Mining Conference and Exhibition

Livegauge is exhibiting at the WA Mining Conference and Exhibition held at the Perth Convention and Exhibition Centre on October 11 and 12. Come visit them at booth C120 to see how they can create a customised solution for your company.

**For more information or to request a quote, visit [livegauge.com.au](http://livegauge.com.au) or contact them on 02 4017 0198.**

**Stay safe and get out of the line of fire with Livegauge.**

AMR



## ELIMINATE LIVE WORK CUSTOM KITS FOR TESTING HEAVY MACHINERY

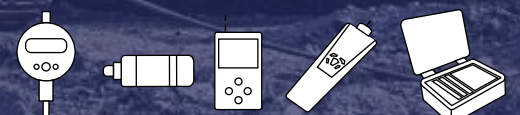
- Hydraulic Pressure
- Movement Checks
- RPM Measurement
- Boom Sag & Track Testing
- Rotor Runout
- Vibration Analysis
- Crankshaft Deflection



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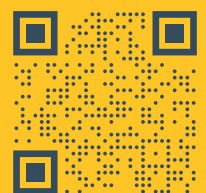
# Outstanding power with premium carbide



United. Inspired.

## Epiroc rotary drill bits

The new Epiroc rotary premium carbide gives you outstanding power. Using industry leading processing technology, the rotary tricones have 10% increased service life which will let you continue drilling longer and add another shift in your automation mode. On top of that, increased service life also means less changing of tricones – improving the overall work environment and optimising operations. Use the Epiroc rotary premium carbide to absorb the full force from your drill rig and unleash its power.



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10cm GSD Analysis-ready Imagery.

# OUTLINE

## REALITY TO SHAPE CHANGE

**P**erth-based geospatial technology expert Outline Global continues to support the digital transformation in the mining sector. A growing portfolio of services which include multispectral imagery, LiDAR and geospatial data intelligence have opened new possibilities for the industry.

Established in 2009 to cater to the mining sector's need for high-quality aerial imagery and data services, Outline Global is an Australian owned and operated company that has developed and commercialised a hybrid technology to bring unique capabilities to solving complex challenges.

Mining is a vital sector of the global economy, providing essential raw materials and energy. The global energy transition man-

date has further highlighted the importance of the mining sector amid existing and emerging challenges, such as environmental degradation, safety risks and continuous productivity improvement.

To overcome these challenges, mining companies need to embrace modernisation and innovation, leveraging new technologies and best practices to improve their operations and performance.

Head of Growth of Outline Global Kevin Kwok says, "modernisation is not about bringing a truck load of "new ideas" to the table but rather to be a partner of choice for solving clients' real-world problems. To shape positive change, we have a duty to demonstrate the possibilities that are available to them."

"We believe in perpetual innovation, and to foster this, we need to be in lockstep with our stakeholders to help them unlock real possibilities. Be bold, lead the way when and where you have the expertise, but for the most part, listen; our technology may only be one piece of the mining puzzle."

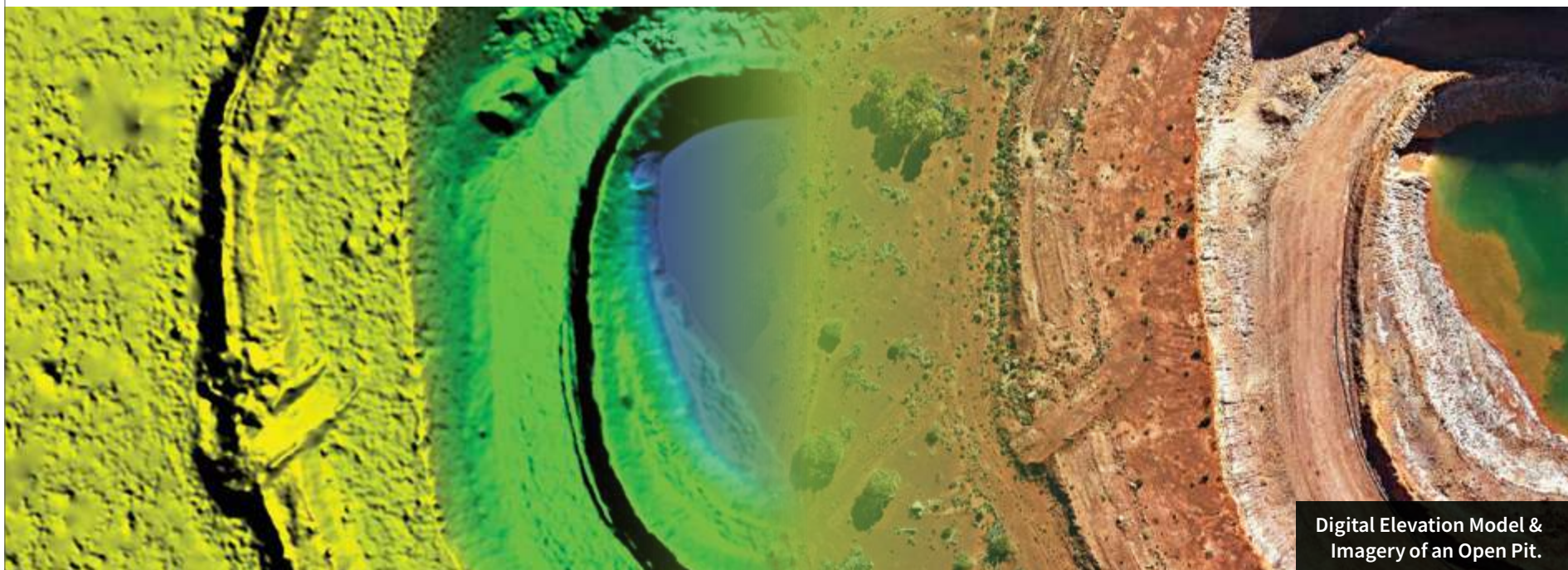
He also says that while the company is built around technology and people, he recognises the importance of the company's approach to partnering with their customers and other industry partners.

"The mining industry has enormous potential, and I am humbled by the openness and dedication across our ecosystem. Mining modernisation is not a one-size-fits-all solution. Each mining company needs to

assess its own situation and goals, and tailor its modernisation strategy accordingly. However, by embracing this as a strategic imperative, mining companies can unlock new opportunities and create value for themselves and their stakeholders."

Outline Global is focused on reality capture and supplying digital insights for mining companies. Digitisation involves the use of data analytics, artificial intelligence and cloud computing to optimise decision making, planning and management in the mining value chain.

Our clients are relying more and more on high-fidelity geospatial data and insights to assure visibility, traceability and verifiable truths throughout the mining lifecycle. **AMR**



Digital Elevation Model &amp; Imagery of an Open Pit.

**Australia's choice** for premium quality geospatial Imagery, LiDAR and location based Artificial Intelligence delivering data intensive geospatial Insights

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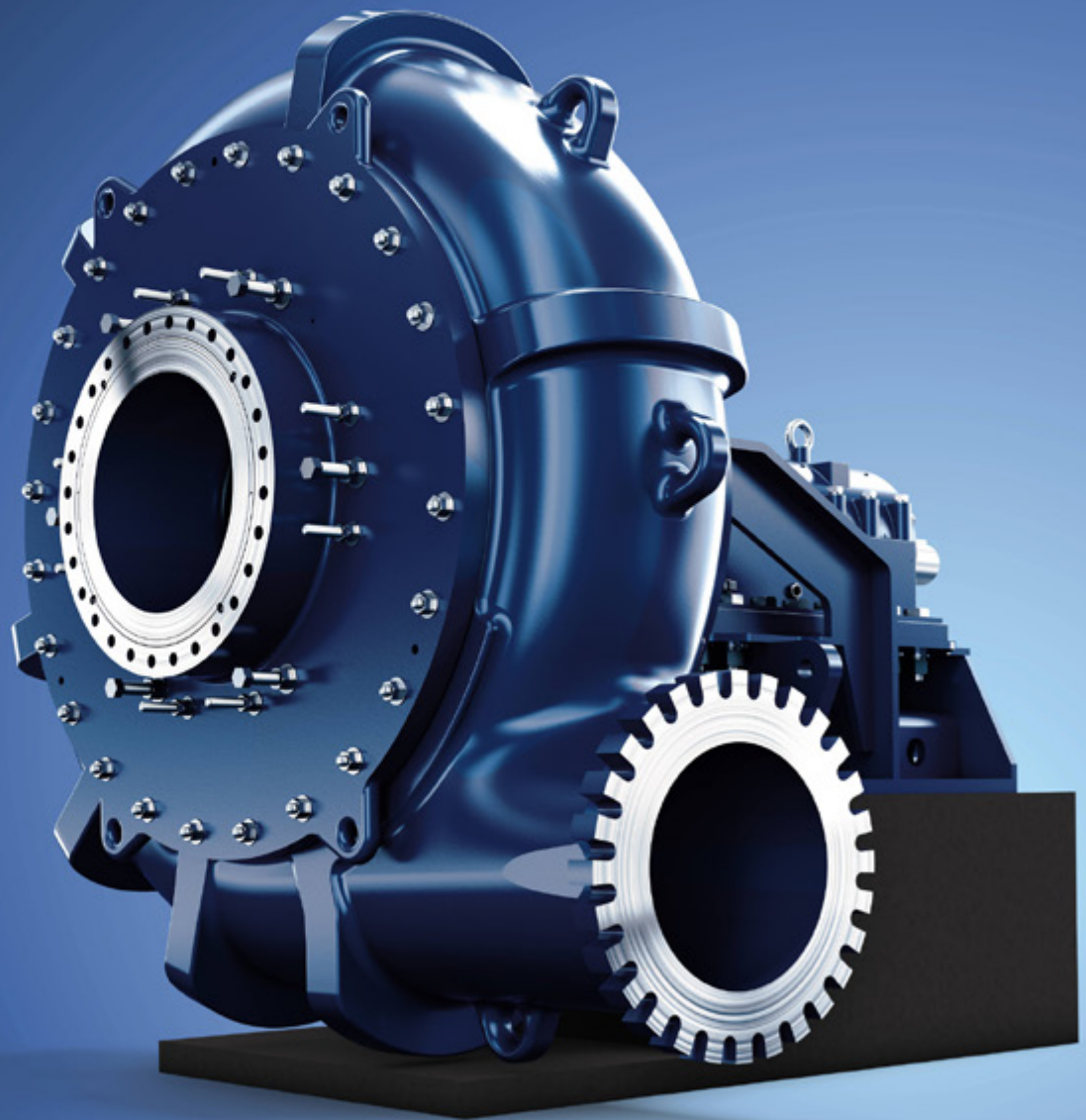
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# BEST IN CLASS CYCLONE FEED PUMPS



GIW® MDX



The GIW® MDX is specifically engineered to handle the extreme conditions found in hard rock mining applications. Superior hydraulic design, advanced material technology, and local aftermarket support make the MDX the best in class slurry pump for aggressive slurry applications.

Visit us at the upcoming [WA Mining Expo](#) on stand E108 to discover our Best In Class Slurry Pumps or learn more at [www.ksb.com.au](http://www.ksb.com.au)

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MINING





# DONT BE LEFT IN THE DARK.



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# BET ON BARTLETT AT EVERY DEPTH



**M**ineral 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 of 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 assured Bartlett has the right methods to suit every application.

Mr Bartlett said the company had 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.

**For more information, visit  
[www.bartlettresources.com.au/](http://www.bartlettresources.com.au/)**  
AMR

## EXPLORATION DRILLING AT ITS FINEST

With over 30 years in the drilling industry, Bartlett Resources has your drilling programs covered at every depth, in any environment. Utilising a range of specialist drilling techniques to **achieve the best project outcomes in different environment, you can bet on Bartlett to deliver.**

- Air Core (AC) Drilling
- Slimline Reverse Circulation (RC) Drilling
- Rotary Air Blast (RAB) Drilling
- Mud Rotary
- Geotechnical - SPT Drilling
- Exploratory Earth Probes
- Auger - Soil Sampling



 [www.bartlettresources.com.au](http://www.bartlettresources.com.au)



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## PROVIDING QUALITY TRAINING AND RECRUITMENT SERVICES TO SUPPORT THE FUTURE OF AUSTRALIA'S MINING INDUSTRY

The mining industry is an essential part of Australia's economy, contributing billions of dollars to the country's GDP each year. With the industry's growth, the demand for skilled and qualified workers has also increased. Companies like Richards Mining Services (RMS) have become integral in providing the necessary training and recruitment services to support the industry's future.

RMS offers a unique approach to training that goes beyond traditional courses. RMS owner and accredited Mine Manager Graeme Richards has developed an online prerequisite requirement for all mobile plant courses consisting of comprehensive video training that the student can view in

their own time and at their own pace. This allows continuity of training for all students, convenience of reducing classroom work and the most relevant content to a mining operation due to the messenger being delivered by Graeme himself. Students then attend RMS for their revision and practical component.

Consistency is a hallmark of RMS training. Regardless of when or where training takes place, operators receive a consistent message and outcome. The continuity in training ensures a comprehensive understanding of operational best practices and industry standards. RMS prides itself on being a one-stop shop, offering a full range of nationally accredited mobile

plant courses. From HR licenses to dump truck tickets and first aid certifications, RMS equips operators with the necessary qualifications to step into any company and hit the ground running.

Going a step further, RMS's actively facilitates connections between their accredited candidates and companies seeking skilled operators. By providing fully accredited potential employees, RMS saves companies the time and effort of searching for qualified individuals. This placement service highlights RMS's dedication to bridging the gap between job seekers and industry demands.

With a proven track record spanning 22

years, RMS remains a trusted name in the mining, transport, and civil industries. Their expertise in mobile plant operations, comprehensive training programs, and unwavering commitment to quality have made them an indispensable partner for companies and individuals alike.

RMS continues to shape the future of Australia's mining industry by providing top-notch training and recruitment services.

Through their focus on mobile plant operators and nationally accredited courses, RMS ensures operators are well-equipped to excel in their roles, drive productivity, and contribute to the industry's growth.

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## Our Reputation, Your Success



### Courses include:

- High Risk Training Courses
- Safety Skills
- First Aid
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- Mobile Plant Training
- Fire Training
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RMS is a training and recruitment organisation that provides comprehensive services and programs to individuals seeking professional development and employment opportunities.

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# GAS TURBINE TECHNICIANS GAIN RELIABLE ACCURACY WITH A POPULAR EMISSION ANALYSER



The testo 350 is ideal for regular emissions testing on gas turbines.

**A**s a crucial component of any combined heat and power plant, regular testing and tuning of gas turbines is essential.

Accuracy reigns supreme in this type of work, both at high and low level gas concentrations. Without a reliable tool, operational efficiency of the entire plant can fall off track. With thousands of dollars on the line and the integrity of the equipment at stake, it's no wonder why so many technicians turn to the reliable multi-sensor emission analysers to be sure they've done the job right.

#### Obstacles ahead ...

Service engineers regularly run tuning and testing on gas turbines to evaluate whether the system is meeting the original equipment manufacturer's operating specifications, as well as emission value limits.

Optimal performance can often be proved by assessing the relationship between exhaust gas and the combustion process ... a delicate but volatile pair. Technicians may have to deal with either very low or very high concentrations of gas like NOX and carbon dioxide, as well as understand the oxygen content in the fuel mixture area.

Being able to gain flexibility in terms of measurement parameters without compromising on reliability or accuracy is paramount, as the readings can dictate the overall efficiency of the plant.

Rather than use various methods to test each gas, many service engineers are opting to deploy convenient digital tools for regular testing.

#### Solution is here ...

The testo 350 gas analyser is a durable multi-sensor meter that allows for up to

six simultaneous dry readings for EPA licensing requirements for the following gases:

- Carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>)
- Sulfur dioxide (SO<sub>2</sub>)
- Hydrogen sulfide (H<sub>2</sub>S)
- Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), (NO<sub>x</sub>)
- Hydrocarbons (C<sub>x</sub>H<sub>y</sub>)

Ideal for testing and tuning of gas turbines at combined heat and power plants, the testo 350 is housed in a rugged exterior case, but retains flexibility through its optional sensor inputs.

The tool consists of two separate units; the control unit which handles emission measurement readings, as well as the analysis box for measuring emissions.

The testo 350 comes with a rugged exte-

rior to handle the toughest work environments.

The key to the popularity of the testo 350 is its ability to measure at both high and low concentrations of gases due to its highly accurate sensors, allowing technicians to shed the number of tools they need to complete the job. Its pre-calibrated sensors can be ready to measure in just 30 seconds. The control unit allows easy analysis as well as data storage.

With the efficiency of the plant on the line, service engineers need to be sure they have the right professional instrumentation to carry out regular tuning and testing.

**Contact your local Testo industrial distributor or Testo directly for more details.**

AMR



Be sure. **testo**

Your partner for **plant efficiency, energy costs and safety.**

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# BRTS

## A “ONE-STOP SHOP” FOR MINE DESIGN & PLANNING



**M**ining companies can reduce the likelihood of injury or death from rock falls with Bamford Rock Testing Services (BRTS); a NATA-accredited specialist highly experienced in creating stable mine sites.

Based in North Melbourne, the service is considered a one-stop-shop for geotechnical and mechanical decision making in mining and tunnelling projects. Operating from a laboratory, the business can determine how difficult it might be to remove rock from the ground as well as to stabilise the openings left behind.

BRTS Director Dr Bill Bamford said these kind of tests helped mining operators design stable slopes, tunnels, raises, and stopes, and to specify and select excavation machinery.

Apart from significantly reducing the likelihood of catastrophe, Dr Bamford said the analysis would also prevent sub-optimal production caused by purchase of machinery inappropriate for the rocks.

“Ultimately, mining companies need to consider the stability of their operation, as well as selection of the rock-breaking machinery,” Dr Bamford said.

“Design of stable mine openings needs to be based on physical and mechanical properties of rocks, such as density, compressive and tensile strengths, permeability, ultrasonic wave velocities, and the shear strength, roughness, and frictional resistance of rock joints.

“BRTS has state-of-the-art, NATA-accredited laboratory testing equipment to measure all of these.

“The planning of a mining operation also requires selection of the most appropriate excavation machinery.

“This requires knowledge of the strength, toughness, brittleness, and abrasiveness of the rock.

“BRTS is uniquely equipped to quantify all of these, and to predict the produc-

tivity of different drilling and excavating and cutting machinery, and the probable tool wear and cutter consumption of ground-engaging tools.”

Dr Bamford said BRTS support meant planning engineers could determine the feasibility and costs of the total excavation process in the design stage and can use these objective productivity forecasts and tool wear as a benchmark to evaluate machine performance.

Leveraging BRTS testing, mining operators can learn how long it might take for rocks to soften or fail and can safely design mine tunnel support systems with strength and deformation tests on rock bolts and cable anchors.

Dr Bamford said all relevant information can also be gathered at the beginning of an exploratory drilling program, allowing operators to maximise the value of the data.

“So, BRTS, staffed exclusively by

graduate engineers, some qualified to Masters or PhD level, is uniquely able to advise on all geotechnical and mechanical aspects of mining operations, from pre-feasibility studies, to expansion planning,” he said.

“I first established a rock mechanics laboratory at the University of Melbourne in 1967, before moving it to Coffey in 2011.

“The lab became BRTS in 2014.

“We are continually innovating testing and interpretation procedures, in response to real-life challenges coming from industry.

“It has left us uniquely placed to analyse Australian rocks and, thanks to our expertise, see clients send in samples from around the world.”

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Established approximately 30-years ago, Como Carbon has made a name for itself as a trusted provider of gold retrieval services, enabling mining operators to squeeze more of the coveted metal from their operations.

The gold is found in activated carbon fines, which are typically collected from ground spillage and tails safety screens.

Como Carbon Services Plant Manager Kim Dalton said there was previously no simple and cost effective way to recover the carbon, leaving the material to sit in bags and drums on-site indefinitely.

But after experimenting with recovery solutions, Mr Dalton said his team had developed equipment and methods to strip the by-product of precious metals and hand as much as 99 per cent of contained gold back to the operator.

He said this often improved monthly production figures and metallurgical accounting.

"Mining companies can make more money when they engage us to carry out this process," Mr Dalton said.

Aside from gold recovery, the Western Australian business helps operators feel more confident in their supply chains by recycling industrial-use carbon.

The recycling services means mining companies have to rely a lot less on expensive imported product, increasing their protection against cost spikes and global supply chain disruption.

Mr Dalton said the waste carbon is cleaned, sized and returned to an operation, lowering overall expenses, minimizing gold losses and boosting a client's green credentials.

"From large mining operations to individual operators we have shown that we are a leader in our field," Mr Dalton said.

"The Como Carbon Services team has many years of experience that guarantee client material is treated to the highest standards and results are delivered."

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## SERVICES:

- » **CARBON WASHING** – Using gravity separation and elutriation, Como Carbon Services recovers carbon from material containing rock, sands, plastics, wood fibre and other damaging materials. The company's stripping plant is capable of processing up to 3 tonnes per hour resulting in a clean carbon product ready for stripping. Recovered carbon is packaged in 1 cubic meter bulk bags for easy handling and storage.
- » **CARBON SIZING** – Removal of fine carbon is essential to reducing fines migration through a CIP/CIL circuit. This is important because fine carbon can be lost to tailings and take with it quantities of gold and other precious metals. The sizing plant processes approximately 1 tonne per hour. Fines can be returned to the client or disposed of.
- » **CARBON STRIPPING** – Como Carbon Services has a highly efficient IPS circuit resulting in low barren carbon values and can provide regular scheduled stripping to clients without onsite processing facilities.
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# REVOLUTIONISING SAFETY

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The new Nordic Scorpion PRO 415 PH & Canis PRO 415 PH with Phenom Optics.

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Through collaboration with our customers and our leading suppliers, NAPA Auto Parts has been able to identify, develop and source a growing range of innovative products and solutions, to improve efficiency, safety, and profitability that are crucial to the success of mining operations.

Our commitment to delivering high-quality products and services has made NAPA Auto Parts a trusted supplier to some of the Australia's largest mining companies.

NAPA Auto Parts Australia has recently announced the release of the new Phenom optics lights from Nordic into the Australian market.

These lights are designed to provide high-quality illumination for a range of applications, including heavy-duty and mining environments.

The Phenom optics lights feature advanced

LED technology that provides bright, clear light with low power consumption.

They are also built to withstand tough conditions, with rugged construction and water-resistant design.

This makes them ideal for use in heavy-duty and mining environments, where reliability and durability are essential.

One of the key features of the Phenom optics lights is their advanced optics system.

This system uses precision lenses and reflectors to focus and direct the light, providing maximum illumination exactly where it's needed.

The glass lens on these lights has excellent thermal resistance and superior endurance against different weather conditions, making them highly durable and reliable in harsh environments.

The patent-pending optical solution on the Phenom optics lights also provides a real anti-glare light, making them safe and comfortable to use in heavy-duty and mining environments.

The glare-free zone will not blind people

working near the vehicle or equipment, while the task lighting effectively illuminates the work area.

Additionally, the soft illumination upwards serves as a guide light for successful lifting or other operations.

The Phenom optics lights are also EMC CISPR 25 Class 5 rated, meaning they will not cause disturbance to radio.

This makes them safe to use in environments where radio communication is critical.

The Phenom optics lights suit different needs in heavy-duty and mining applications.

The Scorpion PRO 415 PH and Canis PRO 415 PH models are two examples of these lights that come equipped with a three-in-one optical solution.

They provide warm and natural colours with an excellent colour rendering index (CRI) of 80 and 5000K, making them ideal for use in mining environments where colour accuracy is important.

NAPA is happy to be the exclusive distributor for these lights in Australia.

"We know that reliability and durability are essential in heavy-duty and mining environments, and the Phenom optics lights from Nordic provide exactly that," said Lighting Merchandise Manager Luke Bolton.

"They're built to withstand tough conditions and provide excellent illumination for a range of tasks, from automotive repair to mining operations. We're excited to bring these high-quality lights to our customers in Australia."

Overall, the Phenom optics lights from Nordic are an excellent choice for anyone looking for high-quality, reliable lighting in heavy-duty and mining environments.

With their advanced optics system, rugged construction, and anti-glare technology, these lights are built to last and provide excellent illumination exactly where it's needed.

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Chironix	H105	Koodaideri Innovation and Technology	B123	Tang Technology	G125
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# STATE OF TECHNOLOGICAL MARVEL:

## WA MINES MINISTER BILL JOHNSTON

By Kate Dzienis

*The WA mining industry has been full throttle for years as we all know, with lithium making its way to sit alongside iron ore, gold and nickel as one of the State's best performing minerals. WA Mines and Petroleum, Energy, Hydrogen Industry and Industrial Relations Minister Bill Johnston spoke with the Australian Mining Review's Kate Dzienis about lithium developments within the State, an update on the Pilbara Industry Roundtable and why WA is being seen as a leader in technological mining advances.*

**W**A continues to position itself as a lithium minerals hub, taking strategic advantage of the mineral's global demand thanks to an increase in electric vehicles and energy storage system markets.

WA Mines and Petroleum Minister Bill Johnston said the supply of lithium in the state between 2021 and 2022 went up by one-third, but the value went up by 600%.

"We're particularly enthusiastic about our great success in the downstream processing space," he said.

"We've got Tianqi with their Train 1 ramping up to full capacity and Train 2 already partly constructed.

"Covalent are well advanced on the construction of their processing train and we're confident they will build further trains once that one is operating in a stable state.

"And, of course, Albermarle already have two trains in operation and another two in construction.

"We're also talking to a range of other companies about the processing of lithium in a range of locations across the State.

"Likewise, in nickel production we're seeing people with many plans to go downstream in their nickel supply as well."

### Pilbara Roundtable Update

On 26 July 2023, Mr Johnston announced that the State Government agreed on clean energy development in the Pilbara at its Pilbara Industry Roundtable (PIR), with a commitment to net zero emissions by 2050 and an agreement by PIR members on common use electricity infrastructure in the region.

Having worked intensely over the past 12 months on the PIR, Mr Johnston explains the PIR recognises the challenges and opportunities that decarbonisation presents for the industry.

"This is the commitment the industry itself has, and we've worked with large users of electricity and the suppliers of electricity in the Pilbara to agree on a roadmap to the future – which involves moving to shared infrastructure," he said.

"High renewable electricity works best in a large group, therefore there are advantages to these companies in sharing that infrastructure.

"In the past, sharing infrastructure was seen as an opportunity for advantage, but now it's recognised that for renewable energy, sharing infrastructure is the lowest cost and highest reliability pathway.

"The framework understanding is that it will now proceed with a number of pieces of work to eventually do the necessary



WA Mines and Petroleum Minister Bill Johnston on a site visit at BHP's Nickel West.

technical planning to develop the framework and to work with the First Nations peoples in the Pilbara to make sure we understand their needs, make sure they can be part of this new opportunity and that the infrastructure can be placed in a sensitive manner on their country."

Mr Johnston also explains there can't be an integrated grid without government involvement and he wants to show the leadership that industry is seeking, which is what he has been doing with the four roundtable meetings over the past year.

"The PIR has been bringing people together, qualifying the challenges involved and developing pathways to solve all the challenges," he said.

"There are already some priority projects that are coming forward, and we're talking to the potential users of that infrastructure to make sure it's all executed on a common-use basis and it's done properly.

"It's fabulous that the industry has recognised that renewable energy is a new phase, that it's the best pathway forward.

"The commitment to decarbonisation is important to the planet, and recognising that in order to achieve it, the best way to do that is in a cooperative manner – a great step forward for industry in WA, showing people are making the mindset change."

### The Powerhouse That Is WA

In the August edition of *Australian Mining Review*, we featured news that Roy Hill mine in the Pilbara was heading in the direction of being one of the world's biggest autonomous sites – and an incredible representation of how well WA is moving forward with technology.

Mr Johnston says much of the global population doesn't realise that WA's mining industry is a technological marvel, and that the reason we're able to produce so well

is because we can apply technology and solve problems.

"The use of remote sensing and operations, the use of autonomous vehicles are 'the everyday' here in WA," he said.

"The other thing that it allows is exceptionally high productivity for the workers, and high levels of safety.

"I've talked to workers at autonomous mine sites who say they prefer to work there because of the higher levels of safety, eliminating dangerous jobs.

"So there is a lot of upside.

"What people don't realise with having this much higher level of productivity means that mines who once upon a time couldn't proceed are now coming into production, meaning there are now more jobs in the mining industry because we're applying technology that helps us.

"For instance, our iron ore industry has over 60,000 workers compared to around 20,000 in the year 2000.

"The number of jobs in our mining sector continues to grow, because we're applying technology, not in spite of it.

"A lot of the mines would never come into production if they had to use traditional methodology."

On a global platform, WA is continuously seen as a leader in mining with its technological advances and significant contribution to Australia's workforce.

The upcoming WA Mining Conference and Exhibition (11-12 October) in Perth will showcase the technical and digital innovation across the industry while illustrating the powerhouse that is WA. **AMR**

**"Mining conferences like the WA Mining Conference & Exhibition are an important opportunity for industry to share their learnings about applying technology to solve problems. It presents a great opportunity for people inside the mining industry and beyond it to see the advanced technology that is available. It reminds people of the highly skilled jobs that are coming from the mining sector here in WA and the many opportunities available for individuals to grow and develop."**

WA Mines and Petroleum, Energy, Hydrogen Industry and Industrial Relations Minister Bill Johnston.



(Image source: Group 6 Metals)  
Aerial view of the Dolphin tungsten mine processing plant.

# 31 YEARS ON: RESTARTING COMMERCIAL PRODUCTION AT THE DOLPHIN TUNGSTEN MINE

## CONTINUING FROM FRONT COVER

"When the current directors took over management of the project in 2011, they explored many development models and partnerships to redevelop the mine, eventually landing on the current development



(Image source: Group 6 Metals)  
Managing director and chief executive  
Keith McKnight.

which is a six-year open cut operation followed by six years underground, then a final open cut to extract the last of the high-grade ore in the Dolphin Pit," Mr McKnight said.

"As the cashflow ramps up from the Dolphin operations, the company intends to undertake a systematic exploration program to delineate an economic deposit to increase the mine life of the operation."

Due to the historical volatility of tungsten prices, Mr McKnight said different mining and processing options were looked at.

"Many different mining and processing options were looked at, with a view to striking a balance between capital and operating expenditure which would deliver the best result for the project," he said.

In mid-2021, the Tasmanian Government gave a \$10m loan to the Dolphin tungsten mine, giving Group 6 Metals momentum to secure necessary project funding from major shareholders, Cat Finance and Pure Asset Management.

This was support by an equity raise from both new and existing shareholders, allowing Group 6 Metals to proceed with re-development activities for Dolphin

in late 2021. Construction began in late January 2022, with successful commissioning achieved in June 2023.

"While the site could be considered a brown field site, we installed a brand-new tungsten concentrate plant, tailings storage facility, power station and other mine support infrastructure," Mr McKnight said.

By installing a new process plant, Group 6 Metals was able to add certain improvements to a traditional gravity circuit to optimise the overall performance of the plant. The company is now reaping the benefits with the plant producing a high-grade concentrate in excess of 70%.

The continuing operation of the process plant is being supported by Gekko, Cromarty and original equipment manufacturers and their agents to ensure the equipment is maintained in good working order.

Mr McKnight said the project development was predominantly self-executed with input from key specialist consultants.

"The project development was largely self-executed with input from key specialist independent consultants that were involved in the project for quite some time prior to commencement of construction," he said.

"While others may have lost hope that the

project would ever get redeveloped, they showed great commitment and belief in the project playing a very significant role in the success achieved to date.

"The project development was also supported by William Adams, Gekko Systems, Frontline Electrical, JMK Civil Construction and DGA Australia.

"While the company run the mining fleet, we have enlisted the services for Maxfield Drilling and Maxam to provide drill and blasting services."

When steady state production has been reached, Mr McKnight expects to export 70t to 80t of concentrate per week, equating to around four 20ft containers.

"Our concentrate is a low volume, high value commodity and therefore not particularly challenging from a logistics point of view. We are fortunate the operation is located adjacent to the Grassy Port and we have direct private access to it," he said.

"We currently have two offtake agreements with Wolfram Burgbau Hutten (a wholly owned subsidiary of Sandvik) and Traxys, both of which are based in Europe. It was a major milestone for the company export its first container of concentrate off the Island in July."

## Environmental Protection

Since 1917, Dolphin has been operating in





# RCIAL STEN MINE

By Ashleigh Melanko

a way that is low impact to the flora and fauna of King Island.

"The company is very focused on preserving the local environment around the mine and on King Island. King Island is a beautiful island with a world-renowned reputation for its produce and tourism," Mr McKnight said.

"The company has put 38ha premium conservation area under a conservation covenant which will preserve this disturbance on the mine, electing to locate the tailings storage facility on the old historic tailings area.

"Our key focus going forward is reducing our diesel power generation on the Island which we hope can be achieved over the next two years with the execution of a renewable energy project."

## Impact on Local Economy

Since operations began in 2022, Dolphing has had a positive impact on the local economy, with Group 6 Metals trying to use local materials and service providers where possible.

There has been strong support from the King Island community as well as the wider Tasmanian economy. Furthermore, the local town of Grassy has seen a big boost in activity as a result of the mine.

"We have had strong support from the

King Island community and the local town of Grassy has received a big boost from the increase in activity as a result of the mine," Mr McKnight said.

"We currently employ around 105 people to support the operations at the mine with approximately 25% of those residing on King Island. What is also very pleasing is we have King Islanders returning to the island to take up employment at the mine.

"Longer term, we would hope the mine can provide opportunities for young King Island residents seeking skilled training allowing them to remain on the island."



(Image source: Group 6 Metals) Load and haul activities at Dolphing.

## Dolphing Tungsten Mine

FEATURE 51



(Image source: Group 6 Metals) The Dolphing tungsten mine processing plant.



(Image source: Group 6 Metals) Dolphing tungsten mine open cut mine.

## Future Focus

Group 6 Metals' site team is now focused on ramping up production and fine tuning the performance of the process plant to maximise recovery and concentrate production.

The company will also focus on developing its renewable energy project which will deliver cost savings to the Dolphing Tungsten Mine.

"Following the ramp up of the mine to steady state production, the company will focus its efforts on developing its renewable energy project to replace a signifi-

cant portion of the current diesel power generation which will deliver significant cost savings to the project," Mr McKnight said.

"Earlier this year the company executed a Memorandum of Understanding (MOU) with Fortescue Future Industries (FFI) to explore the development of a renewable hydrogen project to supply cheaper renewable energy to the mine to meet its current and future power requirements.

"Not only will this improve the green credentials of our tungsten products but would also supply hydrogen and heat energy required for downstream processing.

"We are hopeful we can conclude this initial due diligence phase in the next six to eight weeks and progress to a feasibility study."

Dolphing currently has a mine life of 13 years but with the significant regional exploration area surrounding the mine, it's expected to extend well beyond 20 years.

Over the next 18 to 24 months, Group 6 Metals will be focusing on advancing its regional exploration strategy at Dolphing to identify another economic resource. This could potentially extend the mine life, maximising the potential of the newly installed process plant. **AMR**



# DRILLING COMPANY OF CHOICE FOR GROUP 6 METALS



**M**axfield Drilling offers total drilling solutions, with the most advanced drills for all surface mining, quarry drilling and civil construction work.

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With an impressive list of current and past blue-tier clients, Maxfield Drilling managing director Dean Maxfield says the core of the company's success is its strong customer service and honesty.

"We have built a solid reputation of quality and professional work," he says.

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All services are covered, including but not limited to, production blast hole drilling, pre-split, rotary, down-hole hammer, top hammer, depressurisation/sewatering drilling, exploration reverse circulation grade control and sampling, geotechnical, ground anchors and soil nails and remote drilling.

#### Outstanding Safety and Environmental Performance

With an outstanding safety record spanning over 35 years, Maxfield Drilling is focused on staying at the forefront of safety.

The company works to high environmental standards while achieving its hallmark high production levels.

There are clear work, health, safety and

environmental policies and this provides a strong indication of the excellent leadership, commitment and accountability Maxfield Drilling has towards these areas.

Drill Safe is the company's Safety Management System, which supports the company in complying with legislation across all Australian jurisdictions, including focusing on best practice in risk management and compliance.

Maxfield Drilling is also committed to providing a safe and healthy working environment and safe systems of work for all its workers, irrespective of their locations.

Equipment, training, instruction, information and supervision are provided to en-

sure all duties are fulfilled in a safe and productive manner.

Maxfield Drilling ensures its workers are adequately trained and made aware of any impacts their decisions and actions may have on the environment.

The company is dedicated to reducing waste, maximising recycling, designing equipment and procedures to minimise impact on the environment, understanding and complying with clients' environmental management systems, policies and procedures and seeking clarification of plans and procedures prior to starting work. **AMR**



## TOTAL DRILLING SOLUTIONS

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# ELGi

## ANNOUNCES DEVELOPMENTS TO ITS DRILL SERIES COMPRESSORS

ELGi Equipments, one of the world's leading air compressor manufacturers, has recently developed several models in its Drill series diesel-powered skid mounted portable compressors, delivering efficiency, reliability, serviceability and space saving gains.



Inconsistent and extreme operating conditions make drilling a very demanding industry. The Drill series diesel-powered skid mounted portable compressors from ELGi have been designed and built to meet the challenges of this industry and exceed expectations when it comes to delivering superior power, performance and reliability.

Finding utilisation in a diverse range of drilling applications, the PG 900S to PG 1250S Drill series models, with free air delivery (FAD) from 900 to 1250 cfm, have recently undergone several design developments:

The new weld-free air intake system with 3-stage air filtration ensures clean air enters the compressor with minimal pressure drop. This has enhanced operation-

al reliability and extended the life of the compressor parts.

The three-stage filtration system, which keeps dust out of the compressor and engine has also been introduced, along with mesh protection in the compressor air intake system, increasing operational life, and making the Drill series compressors particularly suited for operations in dusty environments.

The user-friendly control panel now features an LED light for increased ease of use. This intuitive controller integrates all main instrument controls and monitoring systems.

The operational condition of the system can be easily determined, and all system warnings are clearly displayed.

A range of further design developments have additionally contributed to enhanced safety features, improved serviceability and a more compact solution that has a much smaller footprint.

The entire range of ELGi Drill portable compressors offer superior efficiency, not least thanks to the inclusion of ELGi's unique rotary screw airend which is equipped with in-house developed  $\eta$ -V profile rotors.

The unique design reduces pressure losses and increases efficiency. In addition, the rotors ensure energy efficient compressed air supply for all demanding applications, with higher flow and better specific fuel consumption.

Better maintenance intervals and best-in-

class warranty further assure an overall low cost of ownership.

The complete Drill series from ELGi assures faster drilling and better drilling averages from a compact, robust, and rugged package.

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Whitehaven Coal managing director and chief executive Paul Flynn says there will continue to be long-term demand for the high-quality, high-CV thermal coal that Whitehaven produces across its key Asian markets and for many years to come.

# THE COAL HARD FACTS



The Maules Creek continuation application will keep the coal mine's 800-strong workforce employed until 2043 if approved by the NSW Government.



Coal leaving Maules Creek mine, on train to the Port of Newcastle, before being loaded on vessels that deliver the product to customers across Asia.

Last month, the *Australian Mining Review* spoke with Whitehaven Coal managing director and chief executive Paul Flynn about the Vickery extension project and early mining.

This month, we continue the Whitehaven Coal series and look at other development and expansion projects in the pipeline for the coal miner.

Each of these projects bring continued jobs and economic benefits to the local regions.

## Narrabri Underground Mine Stage 3 Extension Project

The Narrabri coal mine is Whitehaven Coal's only underground operation, approved to produce 11mtpa of high-quality thermal coal until 2031.

Longwall operations commenced in 2012, with three-quarters of its 500 employees living locally.

The Narrabri Stage 3 extension project proposes to extract coal to the south of the existing mine, within the existing exploration lease area, through the extension of its longwall panels and using established surface infrastructure (existing coal handling and preparation plant, rail loop, box cut and offices).

Whitehaven Coal chief executive Paul Flynn says this project will extend the mine life from 2031 to 2044 and provide continued employment for hundreds of people, including millions in spending with local businesses.

"The Narrabri Stage 3 Extension Project will deliver \$599m in additional net eco-

nomie benefit to NSW and enable the continuation of 500 skilled jobs for decades to come," he said.

"Importantly, with 75% of our workforce locally-based, these benefits will be felt in the Narrabri region.

"Alongside securing ongoing employment opportunities, the project will also ensure we can continue to invest in the many local businesses and suppliers that support our operations."

Further economic benefits include \$317m in direct wages to the local community to 2044, \$259m in additional royalties to the NSW Government and \$247m in local supplier spend to 2044.

## Winchester South Metallurgical Coal Project

With a predominantly thermal coal portfolio in NSW, the Winchester South metallurgical project is Whitehaven Coal's first development in Queensland.

Located in the Bowen Basin, 30km south-east of Moranbah in a well-established coal region, the proposed mine will produce 17mtpa of coal for export for 30 years and benefit from its direct access to key rail and port infrastructure in the region.

"If approved, the Winchester South Project will create around 500 jobs and deliver \$882m in additional net economic benefit to Queensland over the life of the mine," Mr Flynn said.

"Winchester South's location in Queensland's well-established Bowen Basin ensures the site has direct access to

key rail and port infrastructure, providing multiple coal export options.

"It also gives us increased exposure to metallurgical coal, which will create diversification opportunities for the business."

The project has been declared a Coordinated Project by the Queensland Government, which recognises the potential strategic significance of the project locally, regionally and to the state of Queensland.

"In early July, we welcomed the formal acceptance of the Winchester South environmental impact statement (EIS) as the final EIS for the project by the Coordinator-General," Mr Flynn said.

"This key approval milestone is part of the Queensland Government's Coordinated Project approval process, which will now continue to progress as the Coordinator-General prepares a report evaluating the EIS."

## Strong Long-Term Demand

Mr Flynn says there will continue to be long-term demand for the high-quality, high-CV thermal coal that Whitehaven produces across its key Asian markets and for many years to come.

"Our mines in North West NSW have an important ongoing role to play in supporting energy security and economic growth in our customer countries, while also maintaining our significant contribution to the economic and social prosperity of local communities around our operations," he said.

## Continuation of Maules Creek Mine

Whitehaven Coal is preparing a new State

Significant Development (SSD) to seek approval for the continuation of the Maules Creek open cut mine within its existing mining tenement beyond 2034.

The mine is Whitehaven Coal's largest and newest mine, operating round-the-clock since 2015 and producing 13mtpa of coal.

"Whitehaven is currently preparing an application to seek approval for a continuation of the Maules Creek Coal Mine (MCCM) within the existing mining tenement until 2043," Mr Flynn said.

"The approval of the continuation application will support the significant employment and economic benefits our largest asset delivers in North-West NSW.

"Maules Creek Coal Mine will continue to employ around 800 people and with approximately 75% of our workforce living in the area, this will deliver substantial long-term financial benefits to local economies.

"This application will enable increased flexibility in the mining and recovery of high-quality coal resources entirely within the existing tenements, with a modest increase to the production limit to 14mtpa of ROM coal."

According to Whitehaven Coal's website, future expansion plans for Maules Creek include increasing production to 16mtpa without adding to the current mining lease area, through full automation of the overburden fleet, 100% in-pit dumping and an additional crusher at the CHPP.

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Panoramic view of the Maules Creek open cut coal mine.



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When fluids are put under pressure to transfer power, determining the problem can be a time-consuming process.

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Power Beyond also has the facilities to service hydraulic and pneumatic cylinders in house — meaning jobs can be completed in a timely manner. Their range of hydraulic parts can be overnight air freighted anywhere in Australia.

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# WATER RENTALS MAKES A SPLASH AT WHITEHAVEN



Rental Microfiltration Reverse Osmosis Facility at Whitehaven Coal, Narrabri

**W**ater chemistry in mine sites can be variable and complex, and so too are the potential treatment methods. This relies heavily on reliable and robust solutions, typically in remote areas, that are tailored to meet various applications in both new and existing plants.

From camp water supply and acid mine drainage treatment, to process water production and desalination, a high level of expertise is required to source and deliver high performance solutions that reduce the mine's risk on water assets.

Australian owned and South Australia based innovative water solutions provider, Water Rentals, is one company well versed in industrial and municipal water requirements. Its integrated solutions are based on environmentally friendly membrane

technologies that are backed by a comprehensive suite of services to ensure reliable performance. The company's simplified tariff-based payment structure is performance driven and helps minimise lifetime operating costs.

In August 2021, Water Rentals was contracted by Whitehaven Coal to provide a mine water treatment solution for a temporary campaign to reduce the water inventory through the production of treated water suitable for reuse in mining operations.

The 4.0 MLD containerised facility consisted of a microfiltration plant (40 ft) and two trains of reverse osmosis (40 ft each) plants, with auxiliaries such as pumping stations, air compressors, chemical dosing and cleaning systems. This system was de-

ployed in September prior to operational commencing in October 2021.

"It was collaborative effort between the two teams that brought this significant facility online in a short timeframe, amidst Covid restrictions and lockdowns," said Water Rentals CEO, Ajay Jaggi.

"This project demonstrates the ability of the plant to perform in extremely challenging feed water quality variations, while achieving the desired outcome. The plant's operational flexibility was stretched as it was repurposed to treat higher salinity water over the remainder of the deployment term. The addition of a high pressure, high recovery stage (40 ft) ensured more efficient operations and brine minimisation."

The success of the plant was a combina-

tion of a high quality build, advanced automation, remote monitoring, technical and operational support, as well as a collegiate approach that ensured the plant was pushed beyond its standard operating envelopes.

The plant operated continuously and reliably throughout the deployment period of 18 months, before demobilisation.

Water Rentals has an extensive asset base that can be deployed within only days to a few weeks to meet bespoke processing requirements that range from months to several years with a treatment capacity of 0.5 - 20 MLD.

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THE AUSTRALIAN  
MINING REVIEW



(Image source: Hillgrove Resources) Existing Infrastructure - mill and TSF.

# HILLGROVE RESOURCES:

## AUSTRALIA'S NEXT COPPER PRODUCER

By Ashleigh Melanko

Located only 55km from Adelaide, Kamantoo Underground was operated by Hillgrove Resources (ASX:HGO) as a series of open pits from 2010 to 2020, producing around 140kt of copper and over 55koz of gold.

Over the past three years, Hillgrove has been drilling to prove up an underground extension which ended in the release of a feasibility study highlighting that Kamantoo could generate over \$200m in free cash flow for a capital requirement of \$25m.

This makes Kamantoo one of the lowest capital-intensive copper development projects anywhere in the world.

### Mining Begins

Mining began in May 2023 with first copper production on track for early 2024.

As anticipated, the underground conditions proved to be very capable, assisting in turning the development faces over quickly and getting to the planned production straight away.

Ore on the run-of-mine is being stockpiled for future processing.

Hillgrove managing director and chief executive Lachlan Wallace said beginning operations was a milestone for the company.

"The commencement of operations was an excellent milestone. I am very proud of the team; within four short years they have taken the underground from concept, through permitting, exploration, feasibility, funding and into operations," he said.

"It is also very pleasing to have excellent support from our suppliers and contrac-

tors that have safely mobilised equipment and enabled the project to hit the planned development rates from day one.

"As we move forward, I am confident that we have the right mix of people and plant to deliver first copper early in 2024."

### Infrastructure in Place

All the critical spares Hillgrove needs, including spare mill motor, gearbox, trunnion bearing, girth gear and crusher swing stock are on site with refurbishment works on track for the restart of processing activities early next year.

The tailings storage facility has sufficient storage for the current mine plan — plus a further 3mt — enabling Hillgrove to house additional tailings as drilling continues to identify additional resources and grow the mine plan without further permitting.

The processing facility has been maintained and is in an operational state while the processing plant is in good condition.

"Since processing operations ceased in 2020, we have maintained the energy and water contracts and continued to pump water through the entire processing and tailings system daily, and every week we inch the mill, and fire up the crushing and conveying system," Mr Wallace said.

"More recently, we have commenced some minor repairs to the flotation cells, however, this is limited to relatively minor welding and fabrication.

"Although keeping the plant energised and maintaining the mill in an operational state is more expensive than a traditional care and maintenance program, it materially reduces the capital and risk when re-starting the process facility.

"Hence our strategy has been to develop an underground mine plan that could secure funding in the shortest time frame possible, with view to recommencing operations and using cash flows to further expand the mine."

### Future Operations

Mr Wallace emphasised that underground operations are the first stage of development and potential exists to grow Kamantoo.

"It is important to emphasise that the underground that we have funded is just the first stage of development. The real prize is extending the mine life through further drilling," he said.

"The stage one underground only includes two of the nine known mineralised lodes that were either drilled or mined as part of the previous open operations.

"Effectively, every time we drill, we hit, and every drill program materially increases the resource base — this positions Hillgrove well to continue to expand the mine through future exploration success."

To take advantage of the rising copper price, Mr Wallace said Hillgrove can ramp up production at Kamantoo at any time.

"The Kamantoo project is extremely well leveraged to copper price. As prices rise, we are able to quickly increase copper production for low incremental costs by simply widening the stopes," he said.

"The processing facility is only 40% utilised in the current plan, and this spare capacity enables the additional copper to be produced without displacing high grade ore, essentially producing more copper into a higher price environment for low cost.

"This uniquely positions Hillgrove to capitalise on rising copper prices quickly, with no capital and no additional permitting." With copper production on track for early 2024, Hillgrove is set to become Australia's next copper producer. **AMR**



(Image source: Hillgrove Resources) Spectral mapping of the face.





# GOING WEST FOR GOLD IN AU-STRALIA

By Kate Dzienis

**W**ith Australia holding about 17% of the world's gold resources, and WA alone producing almost 68% (or 218t) of the country's gold mine output in 2021, it's little wonder that the commodity is doing so well in today's markets.

In fact, there are still many unexplored regions, and surveys are continuously being done by geological groups that indicate undiscovered high grade gold deposits across varying parts of the country.

WA explorer and developer Westgold Resources (ASX: WGX) is an owner-operator focused on mining orebodies in the Goldfields region of the state.

In their June quarterly (Q4) report, the miner revealed they had seen a 13% increase in gold production compared to the March quarter (Q3) and doubled mine operating cash flow to \$64m (from \$32m in Q3).

Bluebird and Big Bell mines were the star performers – both achieving quarterly production records and generating material net cash inflow.

Throughout the quarter, Westgold Resources' all-in sustaining costs (AISC) reduced 4% from \$127m in Q3 to \$122m in Q4.

This was due to lower monetisation of sur-

face stockpiles in Q4. Capital expenditure of \$10m and a \$5m investment in exploration and resource development brought the full year spend in line with FY23 exploration expenditure guidance.

## Production Guidance

After releasing its FY24 production guidance in early August, Westgold expects output between 245koz to 265koz and AISC to be between \$1800/oz to \$2000/oz in the 2024 financial year.

Westgold managing director Wayne Bramwell says the company "...hit the top end of production guidance and mid-point of costs".

"This was achieved while undertaking an organisational transformation which has placed the company in a position to build cash and enhance profitability on a sustainable basis," he added.

Mr Bramwell also said Westgold's safety, cost out and efficiency programs will continue to drive productivity in FY24, and full exposure to the gold price from August will continue to build balance sheet strength.

"The business is now structured to deliver safe and profitable ounces and critically, our FY24 growth ambitions are funded from our existing cash resources," he said.

"Looking forward, prudent capital investment into our organic growth projects such as Great Fingall, the expansion of Big Bell and restart of Fender establishes a growth runway into FY25."

So in addition to maintaining growth capital profiles in its existing mines, Westgold is investing in its organic growth pipeline to expand production into FY25 with \$60m to be invested towards new growth opportunities at Great Fingall, the Big Bell expansion and the restart of the Fender underground near Cue.

## Big Bell Expansion & Bluebird

With Bluebird and Big Bell outperforming, the latter's expansion feasibility study is expected to be complete in Q1 FY24, with external reviews and test work pointing to an operating plan that materially extends the mine life, grade and production profile.

It is expected that a final investment decision will follow soon after, and production from Big Bell below the pegmatites is expected to start in late FY24.

Bluebird is continuing to conduct its extensive resource drilling program.

## Great Fingall

Subject to a positive final investment decision in Q1 FY24, Westgold will immediate-

ly recommence development of the Great Fingall decline.

The new development program is expected to take 18 months to complete with first virgin ore from the Fingall upper and lower lodes expected in H2 FY25.

## Fender

The Fender underground mine near Cue was paused in August 2022 with the portal established and 120m of decline already developed.

Westgold will now recommence production from the Fender underground with first ore expected in Q2 FY24.

About \$6m of growth capital is being allocated to the Fender restart for the continuation of the decline and establishment of ventilation and escapeways to get to first ore.

## On To Exploration

After investing \$19m in FY23 and successfully extending the mine lives of its key operating mines, Westgold is targeting an exploration expenditure of \$25m in FY24.

In FY24, the exploration and resource development focus will shift to the next suite or organic growth opportunities for the company, including Bluebird South Junction, Gibraltar, Peak Hill tenements, Caus-ton and the Cuddingwarra area. **AMR**





# ON-SITE MACHINING AUSTRALIA

## A CUT ABOVE THE REST

2 Large XY Milling Track frame surfaces EX5600 Track frames . WA mine.

**S**tarting the business in 2019, On-Site Machining Australia (OMA) is a small company specialising in large mining mobile equipment repairs.

On-Site Machining designs and builds their own on-site machining equipment for specific tasks, allowing clients to achieve the best results.

They currently have two large slew mills capable of machining from 2m to 6m. These are CNC controlled and only run off 15amp 240V power supply — the only kind of machining to do so on the market.

As the equipment is in-house designed and built, it is specifically made to perform the task quicker and better than any other machines on the market.

A car body bearing mounting surface re-machined on a CAT 6060 Excavator can be completed in one 12-hour shift, with a flatness of down 0.04mm over the entire surface. Previously, this sort of job used to take more than two days.

On-Site Machining also has two large XY milling machines that can machine up to a 2m by 6m area. These are also made and designed in house.

The XY Mills are CNC controlled and run off a power supply of only 15amp 240V. Once a program has been set, the oper-

ator can continue with other tasks. One machinist is capable of running two machines at once, helping reduce downtime and costs for the client.

On-Site also has specialised jigging for specific machinery mounting positions. This allows OMA to set and start machining in the shortest time possible.

These machines are mainly used to machine the mounting surfaces for large excavator track frames and similar jobs. On-Site Machining's methodology and process reduces the downtime and achieves better results than similar machines.

On-Site's goal is to make a machine that will complete the work faster, better and easier than anything on the market.

To maximise quality and ensure tolerance compliance, On-Site Machining Australia uses the Easy Laser E915 system to measure the surface for pre and post machining, allowing the company to identify all the failure modes of any surface. It is also possible to pick up potential cracking or weld repairs in the surface in a survey.

They can identify four modes of failure in a slew bearing mounting surface and com-

pile a complete report addressing these and recommendations for repair.

A lot of companies will address total flatness only because they don't fully understand all possible failure modes and how they need to be conveyed to the client to ensure quality and tolerance compliance.

On-Site Machining understands original equipment manufacturing (OEM) and aftermarket bearing manufacturer tolerancing, and they know how to achieve the best results for the client.

This gives clients the best possible outcome for OEM standards and ensures compliance if any warranty claims on the bearing need to be made.

### Projects

Over the last three years, On-Site Machining has completed more than 100 slew milling projects on large mining excavators.

They work Australia-wide in all mining environments with clients such as Global Lift, BHP, Roy Hill, IMS Mackay, Extreme Excavators, RichGlen, Hitachi, BMA and Golding plus many more.

For more information, visit [on-sitemachiningaustralia.com](http://on-sitemachiningaustralia.com) or contact [onsitemaustalia@gmail.com](mailto:onsitemaustalia@gmail.com)

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# EMPOWERING YOUR BUSINESS WITH A LEADING WORKFORCE SOLUTION

**N**o matter the industry, keeping a workforce up-to-date within their respective trade requires ongoing professional training, whether it's legislation and best practice, safety and compliance, or health and wellbeing. Training is a critical component of any organisation and serves to provide opportunities for personnel to build competency and improve the way they perform their trade of choice.

Leading Australian recruitment agency Unite Resourcing is dedicated to sourcing and placing top talent in the mining, energy and infrastructure sectors. The company takes pride in its ability to connect industry-leading organisations with exceptional blue and white-collar professionals, ensuring the success of their projects and operations over the long-term.

Unite Resourcing has offices and a national presence across Western Australia, Queensland and the Northern Territory, which has strategically positioned them to support project and shutdown works in States with strong resources activity.

## THE UNITE DIFFERENCE

### Extensive Industry Network

Over the years, Unite Resourcing have cultivated a vast network of operators, trades, engineers and facilities management personnel within the mining, energy and infrastructure sectors. Leveraging extensive connections, it swiftly taps into this talent pool to source highly qualified candidates for client projects or organisational needs.

### Rigorous Candidate Selection

Unite Resourcing understand the criti-



cal importance of hiring candidates with the right technical skills, experience, and cultural fit. It conducts comprehensive screening and assessment processes to ensure only the most suitable candidates are presented to clients. Their evaluations go beyond technical qualifications, and encompass soft skills, leadership potential, and adaptability to meet the unique demands of a project and organisation.

### Tailored Solutions for Project Success

A collaborative approach to understand an organisation's specific goals, culture, and project requirements is a fundamental element of the Unite Resourcing team. This is why they design and implement customised recruitment solutions aligned with clients' specific needs. Whether you require temporary staff for short-term projects or permanent placements for long-term operations, Unite Resourcing adopts a flexible approach to ensure your projects are have the right talent at the right time.

### Commitment to Excellence

Unite Resourcing are committed to delivering exceptional service and exceeding their clients' expectations. Backed by a



dedicated team of recruitment professionals, the team works closely you to ensure a seamless recruitment process, providing regular updates and open communication to keep you informed every step of the way.

With a TS 482 Labour On-Hire Agreement, Unite Resourcing provides clients with access to the best global talent pool where they manage all Visa / Mobilisation / Pay-roll requirements.

### Driving Success – International Facilities Management Recruitment Drive

As a testament to their capabilities, Unite Resourcing recently accomplished a landmark achievement by successfully completing an international recruitment drive for a leading facilities management company. This remarkable initiative resulted in the arrival of approximately 50 skilled chefs from diverse backgrounds, joining the organisation and contributing their culinary talents to remote sites across Australia. The resounding success of this endeavour further solidified Unite Resourcing's reputation as a premier recruitment partner, capable of surpassing ex-

pectations and making a tangible impact on the workforce landscape.

### The Fitzroy Crossing Project – Indigenous Engagement

As part of a JV partnership, Unite Resourcing have successfully supported local engagement on the Fitzroy Crossing project, providing various skilled indigenous operators and onsite training to upskill and offering Australian recognised certification. To be involved in this community is a privilege and the company currently have a 63 percent Indigenous workforce engaged on this project.

### Client-Centric Philosophy

At the core of Unite Resourcing's ethos lies an unwavering dedication to their clients' success – understanding that every project is unique, and so are the workforce requirements. By taking the time to comprehend the specific needs, culture, and objectives of our clients, Unite Resourcing ensures that each engagement results in the best match, driving productivity and increased retention.

### Unite Resourcing – The Ultimate Workforce Solution

Unite Resourcing is not just a labour hire and recruitment company – It is an ally, a partner, and a catalyst for your business's growth. With an unparalleled expertise in the mining, civil, and construction industries, a global talent pool of skilled candidates, and an unwavering commitment to excellence, Unite Resourcing consistently unearths and delivers the best workforce solutions for your projects.

For more information, visit  
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# WHERE TALENT & OPPORTUNITY MEET



## Contact Us

Rely on our expert team at Unite Resourcing to handle queries of any scope. Whether you are enquiring as a job seeker, an employer, or just have a general question about industries and recruitment; let nothing go unanswered!

### Perth Office

Level 2, Eastpoint Plaza,  
223 Adelaide Terrace, Perth, WA 6000

### Queensland Office

157 Ann Street,  
Brisbane CBD, QLD 4000

P: (08) 6389 2110

W: [uniteresourcing.com.au/contact-us/](http://uniteresourcing.com.au/contact-us/)



Unite Resourcing are a leading labour hire and recruitment company. Specialising in the mining, energy and infrastructure sectors, Unite Resourcing unearth and deliver a managed mobile workforce to help your business thrive.

Whether you are an experienced veteran, or an entry-level jobseeker, Unite Resourcing will work with you to bridge the current shortage of skills in your respective industry.

- ✓ Mining
- ✓ Engineering
- ✓ Shutdowns
- ✓ Trades & Services
- ✓ Facilities Management
- ✓ Civil Construction
- ✓ Resources & Infrastructure
- ✓ Oil & Gas
- ✓ Road Construction
- ✓ Hospitality





# ENHANCE MINING OPERATIONS WITH AUGMENTED REALITY

In the rapidly evolving landscape of the mining industry, staying ahead of the curve is essential for companies seeking a competitive edge. Augmented reality (AR) technology like Trimble SiteVision, supplied by SITECH WA, is empowering mining companies to enhance productivity, streamline operations and make more informed decisions.

Trimble SiteVision is a user-friendly handheld augmented reality system used for mine site planning and design, communicating new designs and changes to field crews, inspections, determining productivity and calculating quick measurements on site including points, lines and cut and fill values.

Through the integration of real-time data with 3D models, this cutting-edge technology brings spatial data to life by superimposing geological data onto the actual terrain, facilitating better understanding and interpretation of subsurface structures.

The ability to easily visualise complex information in a 3D model as mining progresses is particularly useful when operating a mine. Trimble SiteVision allows users to utilise sub surface mapping information to see the location, size and attributes of the mine site, and see how the plan will affect the surrounding environment. This allows engineers, surveyors and managers to compare planned work to completed work and make crucial decisions based on real-world scenarios, reducing errors and

enhancing the overall efficiency of mining operations.

When it comes to streamlining ongoing operations of mine sites, Trimble SiteVision proves invaluable. By providing real-time access to design models, site plans, and progress data, on-site workers can efficiently carry out tasks with heightened accuracy. This streamlined approach reduces project downtime, minimises errors and optimises material usage leading to cost savings and timely project completion. Trimble SiteVision works seamlessly with data from other Trimble solutions including Trimble Business Centre, Trimble Stratus, Trimble Site Positioning Systems and more to maximise your investment.

Safety remains a top priority in the mining industry, and Trimble SiteVision contributes significantly to risk reduction on mining sites. Through its AR capabilities, the technology allows workers to visualise potential hazards and plan mitigating strategies effectively. Trimble SiteVision allows site managers to quickly determine safety with more efficient and accurate inspections, enabling teams to be better prepared for any challenges they may encounter.

Seamless communication between on-site and off-site teams is critical for smooth execution. Trimble SiteVision facilitates real-time reporting from the field to the office to elimi-

nate delays by enabling remote stakeholders to participate in virtual site visits and review progress with easy-to-understand visualisations. This level of collaboration fosters a more cohesive approach to mining projects and ensures that all parties are well-informed and aligned with the project's objectives.

As the mining industry embarks on a new era of technological advancement, embracing innovative technologies becomes

imperative for sustainable growth and success. Trimble SiteVision is a game-changer for mining companies, offering a myriad of benefits ranging from enhanced decision-making through augmented reality to streamlined operations and improved safety. Contact the team at SITECH WA on (08) 9392 7700 or [sales@sitechwa.com.au](mailto:sales@sitechwa.com.au) to learn more about the Trimble range and see how you can enhance your mining operations with the latest technology.

AMR





# YOUR FUTURE VISION, IN AUGMENTED REALITY

Find out how Trimble SiteVision technology  
can revolutionise your mining operations.



## SITECH<sup>®</sup>

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(08) 9392 7700  
[SALES@SITECHWA.COM.AU](mailto:SALES@SITECHWA.COM.AU)







# WA WATER BORES ARE THE EXPERTS

**W**A 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.

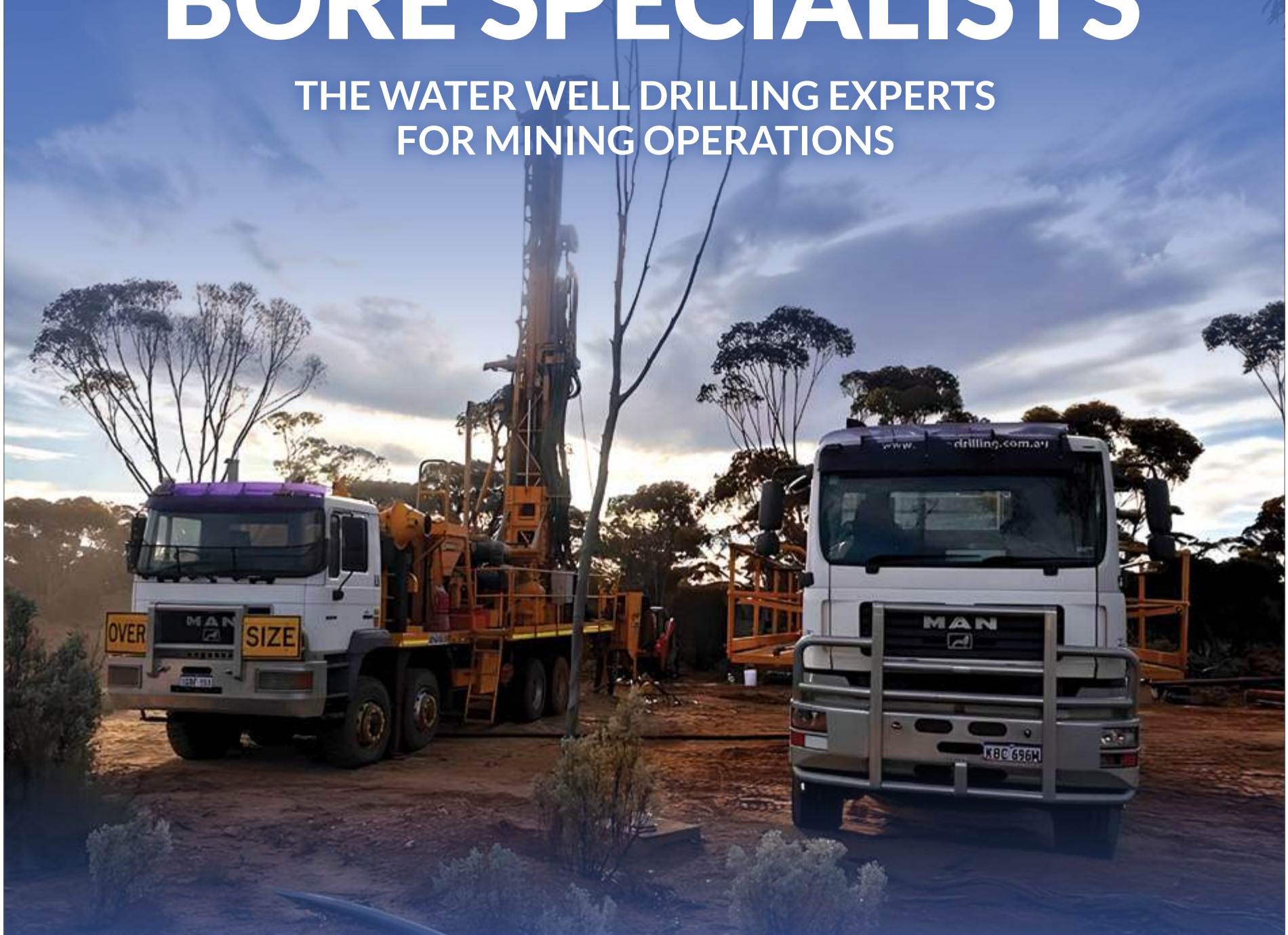
**For more information call  
James Harrington on 0429 695 538**





# WA'S WATER BORE SPECIALISTS

THE WATER WELL DRILLING EXPERTS  
FOR MINING OPERATIONS



## DO IT RIGHT, DO IT ONCE

- Specialising in all aspects of water well drilling including:
- Mud Rotary & Rotary Air Hammer Drilling
  - Water Exploration Drilling
  - Mine Site Dewatering
  - Water Monitoring Bores
  - TSF Geotechnical Holes
  - Complete Bore Field Installation
  - Mine Site Water Supply
  - TSF Recovery Bores
  - Piezo Installations
  - Plus More

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FULLY AUTOMATED IMS SYSTEM

Contact James Harrington 0429 695 538 | james@wawaterbores.com.au





The Amiad DWTP eliminated the need to use bottled mineral water on site, saving between 300,000- 600,000 plastic bottles every year as well as decreasing pollution from their transportation and disposal.

**Southern Peru Copper Corporation** | Toquepala Mine

The turbidity was less than 0.5 NTU (most of the time even less than 0.2 NTU) and the arsenic level decreased from 80-100 ppb to less than 5 ppb

**Lior Avidan** | Process Engineer, Amiad Water Systems



[www.dmi65.com](http://www.dmi65.com)





# DMI-65® FOR ARSENIC REMOVAL

## Drinking water treatment plant (DWTP) filtration system for arsenic removal - Toquepala copper mine, Peru

For more information visit: [dmi65.com](http://dmi65.com)

### REMOVAL OF ARSENIC

DMI-65 is a manganese dioxide (MnO<sub>2</sub>) infused media whose surface acts as a good oxidant and is effective in removing both arsenite and arsenate, as well as iron/arsenic complexes and precipitants.

### IRON AND MANGANESE BUILDUP

Build up of iron and manganese results in very high maintenance overheads, loss of production and potentially system failure. DMI-65® efficiently removes dissolved iron to the almost undetectable levels as low as 0.005mg/L and manganese to 0.001mg/L as well as particulate, effectively removing this risk.

### REDUCED COSTS

The total cost of the iron and manganese removal water filtration system is significantly less than alternative solutions, the effectiveness, but relative simplicity, of DMI- 65® based systems reduces the upfront capital expenditure on plant complexity as well as the ongoing operational expenditure in chemicals, power and backwash waste water recovery.

### HIGH FLOW RATES

The infused technology of DMI-65® promotes the highest oxidation rate of any catalytic filtration media. This permits a significantly higher water flow rate to achieve the same level of iron and manganese removal. DMI-65 can operate at linear filtration velocities up to twice that of conventional media with a corresponding reduction in capital equipment costs.

### HIGH LOAD CAPACITY

DMI-65® also has higher iron and manganese load capacity which can extend the duration of filter runs and the time between backwashing, thereby reducing downtime, operating expense and wastage.

### REGENERATION NOT REQUIRED

The media operates with a continuous injection of sodium hypochlorite at low residual levels (0.1 to 0.3mg/L) which eliminates the need for Potassium Permanganate.

### WIDE OPERATING ENVIRONMENT

Stable and satisfactory performance at pH 5.8 to 8.6 and a maximum operating temperature of 113° F (45°C) reduces the need for investment to alter the operating environment.

### LONG LIFE

DMI-65® is not consumed in the process giving it an expected operational life of up to 10 years, providing considerable advantages over other processes or media. The media does not display a decaying capacity to do its catalytic work. Over the 5 to 10 year period, through many backwashing operations of the bed to remove retained solids, an attrition loss of the media occurs by contact between particles and mechanical abrasion.

### CONTACT

[info@dmi65.com](mailto:info@dmi65.com) | +61 1300 303 281





# BUSINESS DEVELOPMENT PACKAGE

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TOTAL PACKAGE VALUE = \$8,454



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Our **Mining Business Development Package** is a complete toolkit designed to help your company form relationships with key decision makers on mine sites across Australia.

Engage your prospects directly, stay up to date with the latest industry news and market your business to the right people at the right time.

## 9 VITAL TOOLS TO GROW YOUR BUSINESS

**1. MINING DATABASE**

You will receive 12-months' access to the Mining Database with your own personal login, this includes over 850 mines and more than 3000 contacts. Utilise this in conjunction with our other Business Development Package tools. Access to key decision makers:

- CEOs
- Upper Management
- Mine Managers
- Operations Managers
- Purchasing Officers
- HR Managers
- Process Managers
- Exploration Managers
- Maintenance Managers
- Engineers
- HSE (OH&S)
- Emergency Response

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**2. WEEKLY MINING REPORT**

The Weekly Mining report is emailed to your inbox every Friday. Key industry information includes:

- Acquisition
- Developments
- Projects
- Capital Raising
- Exploration Programs

The weekly Mining Report is carefully researched, with real business opportunities and is mine operator specific.

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**3. MINES ACTIVITY REPORT**

The Mines Activity Report is emailed to your inbox every fortnight and is mine site specific. Key industry information includes:

- Shutdowns
- Projects & Managers
- Machinery Types
- Power Plants & Sources
- Exploration Programs
- Construction
- Upgrades & Extensions
- Associated Infrastructure

**VALUE \$1,500**

**4. MINE SUPPLIERS ONLINE**

You receive a 12-month subscription to the Mine Suppliers Online website. Mine Suppliers Online is a well-known directory used extensively by mines in Australia for more than 13 years. Be listed in a category of your choosing (with relevant search terms and keywords) along with your logo, email address and website link.

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**6. CRITICAL MINING NEWSFEED**

You receive critical updates on breaking news across the mining industry in Australia and around the world.

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**7. THE AUSTRALIAN MINING REVIEW**

You will receive 12 HARD COPY EDITIONS (monthly) of our highly regarded flagship newspaper, The Australian Mining Review, delivered to you anywhere in Australia and also access to the online digital edition.

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**8. AUSTRALIAN MINES & SERVICES HANDBOOK 2024**

Our Business Development Package also includes a **FREE PREMIUM LISTING** in the Australian Mines & Services Handbook 2024 in both print and digital editions with a hyperlink to your website.

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**9. AUSTRALIAN MINES & SERVICES HANDBOOK 2023**

You will also receive **FREE**, The Australian Mines and Services Handbook 2023 edition. It is produced in both hard copy and as an electronic version for our subscribers. With detailed data on over 700 Mine Sites in Australia.

**VALUE \$230**

[www.australianminingreview.com.au/BDP/](http://www.australianminingreview.com.au/BDP/)



# TURN YOUR DATA INTO DOLLARS

Gain the reputation for having the most reliable equipment on site and extend the economic and productive life of your assets (Optimal Replacement Time, or ORT).

## What you already know

No surprises here!

- You can control your maintenance costs.
- You can reduce the "costs" of lost production – the time your machines are down for maintenance and unexpected breakdowns.

Condition monitoring and advanced analytics control and reduce your maintenance costs. Mining companies and contractors have expensive machinery and equipment in the field.

Some of them come with technology that generates condition monitoring data to protect and maintain your assets.

## What we know

The reality is not everyone has a skilled technician collecting and analysing their condition monitoring data, to set your maintenance intervals and control your maintenance costs.

The person entrusted with looking after this data holds a crucial role in taking care of your assets, equipment and machinery!

We know that some condition monitoring systems generate so much data that staff switch off from information overload.

Right now, it is possible that no one is using and analysing the data to take the best care of your equipment.

## What you need to know

While your maintenance crew does a great job of fixing equipment, condition monitoring stops it from breaking down.

WT Hydraulics has a team dedicated to condition monitoring:

- We can install the technology into your existing assets.
- We monitor and take care of your equipment.
- We skilfully analyse the data, and support your maintenance personnel in their role.
- We show them what to look for and how to turn the data to dollars!

The WT Hydraulics' CM Team can identify failure patterns and intervene before

a machine breaks down. Condition monitoring is like doing maintenance checks whilst the machine is being used and still producing.

## Artificial intelligence = Saving costs

AI sensors track machine changes and use machine-learning algorithms to identify data patterns that signal the need for corrective action.

WT Hydraulics managing director Kraige Cooper says the company is committed to using technology to drive innovation.

"The WT means Wise Technology and this has been our business mantra for over 20 years," Kraige said.

"What we are able to do now in mining with control systems, robotics and autonomous machinery is no longer beyond our wildest dreams.

## Companies Gearing Up

INDUSTRY FOCUS 71

Don't have your equipment sitting in a workshop for scheduled maintenance or unexpected breakdown and repairs. This equals dollars in lost production.

"To lead in this space, we've added to our team of mechanical, electronic and mechatronics engineers based in Perth to drive innovation and change.

"Our customers that save costs with condition monitoring can use their added profits to finance their next steps into intelligent mining."

**What you need to do**  
Turn your data into dollars!

The "choice" has always been a "no brainer" - reduce your maintenance costs. Turn your data into dollars!

Now you have the support of new technology and the WT Hydraulics' Condition Monitoring Team. **AMR**

Call the CM Team at  
WT Hydraulics, Kalgoorlie  
**Jim: (08) 9022 7220**

## THE PRESSURE IS ON IN THE MINING INDUSTRY



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PROTECT IT WITH HYDAC FILTRATION AND OIL CONDITIONING SYSTEMS



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Dynaset HPW pumps are perfect for at the source Dust Suppression systems to improve worker health and safety.

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Call the WT Hydraulics Team at any of our branches. We can help you with a complete hydraulic system design, installation, maintenance, service and quality hydraulic components.

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# THE STARK DIFFERENCE

**F**rom the moment a drill rig first arrives on any site, expectations are high. A highly experienced team, combined with the latest fleet of rigs, form an integral part of a successful drilling program. Whether you're drilling for gold, zinc, nickel, lead, rare earths, copper, or lithium, you need an experienced team you can count on.

Western Australian-owned company Stark Drilling has over 30 years of RC drilling experience. The company understands the challenges that lie beneath the surface and how to overcome problems on the fly.

Drilling veteran, and Stark Drilling managing director, Courtney Henness, knows what it takes to consistently deliver results safely, cost-effectively, and to the highest quality, regardless of project size, location or requirements.

"At Stark Drilling, we run a well-maintained fleet of operator-friendly, late model equipment, designed by drillers for drillers, with a strong focus on safety design and innovation."

"We've seen a lot of positive changes in the drilling industry over the past three decades. Quickly adapting to these changes has helped us evolve into a big name within the industry, and has seen clients depend on us to deliver safely and economically, while ensuring our activities have minimal impact on the fragile environments that we operate in.

"We don't just stop at mineral exploration and conquering the most challenging ground conditions either. We have built a reputation of faultless hole navigation time and time again. This is coupled with our custom sampling equipment, where

we're leading the way in resource definition, grade control, and water exploration. No job is too big or too small."

The company's expertise lies in remote and difficult drilling conditions such as paleo or deep iron/clay channels. For remote activities, Stark employs complete, compact camps, mounted on 40-foot trailers, which means setup and breakdown time is kept to a minimum, with more focus on the drilling program at hand.

Stark Drilling has also introduced a newly designed Cyclone/Splitter arrangement across its fleet, which has led to a significant improvement in sample quality and maintenance downtime across all drilling conditions.

"We strive to make an impact from the

moment we hit the ground onsite, utilising a vigilant, results-oriented team, and top tier services that help us to extract quality samples, we work together with our clients to hit the required targets at every depth.

"We have also taken things to the next level by establishing our own dedicated supply chain and logistics support service.

This makes mobilisation easy, and enables us to get supplies to and from remote areas for our clients and teams in the field. We understand that remote operations can be a tough game so the support and back-up must be there when and where it's needed."

**For more information, visit**  
<https://www.starkdrilling.com.au/>  
**AMR**

## Discover the Stark Difference in Drilling Services

**S T A R K**  
**DRILLING**



### Welcome To Stark Drilling

At Stark Drilling, we don't just work for our clients, we collaborate with them to ensure the success of their projects. With over 30 years' experience covering everything from resource development, grade control and deep RC, through to remote and Greenfields projects, we have the knowledge, the back-up and the right equipment to deliver outstanding results.

#### Contact us:

☎ 0421 729 202  
✉ [courtney@starkdrilling.com.au](mailto:courtney@starkdrilling.com.au)  
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# PRECISION DRILLING AUSTRALIA'S LATEST RIG REBUILD PDR05:

## A HYDROPOWER SCOUT V MEETING TOP-TIER COMPLIANCE

In an effort to continuously innovate and enhance safety and efficiency in the drilling industry, Precision Drilling Australia (PDA) has achieved a significant milestone with the latest overhaul of Rig PDR05.

The first of its kind, the PDR05 now serves as a platform for future developments. With a fully hands-free rod loading system and core retrieval system in the works, this advanced rig is a testament to PDA's dedication to engineering of cutting-edge safety solutions for the Australian drilling market.

This article highlights the key features and innovations incorporated in the PDR05 rig, demonstrating PDA's commitment to safety, compliance, and sustainability.

### A Revolution in Safety

Safety is the utmost priority in the drilling industry, and Precision Drilling Australia took this commitment to the next level with the PDR05 rig upgrade. The incorporation of multiple advanced safety features ensures that the drilling crew can perform their tasks with minimal risk, creating a safer work environment.

1. Type 4 RFID Interlocks: Rig PDR05 features state-of-the-art Type 4 RFID interlocks, offering enhanced safety measures by ensuring only authorised personnel can access specific areas and functions of the rig.
2. Rotation Upgraded KL400 Drill Head: The rig's upgraded KL400 Drill Head improves drilling efficiency while adhering to the highest safety standards. This enhanced drill head facilitates smoother operations and reduces downtime.
3. Collision Avoidance Systems: Precision installed collision avoidance systems on all moving parts of the drill, preventing potential accidents and collisions during drilling operations.
4. Hydraulic Controlled Rotation Gate: The hydraulic actuator installed to the rotation gate minimises ergonomic risks to the drill crew during angle drilling. This innovative feature streamlines operations and further enhances crew safety.
5. Winch and Wireline Limiters: Integrated winch and wireline limiters ensure controlled movements, reducing the risk of incidents and optimising drilling performance.
6. Control Board Lever Lockouts: All functions on the control board now have

lever lockouts, preventing accidental activations, hence promoting safer operations.

### Innovative Zero Energy Compliance

Precision's dedication to safety and sustainability is further demonstrated through the PDR05 "Zero Energy" compliance system.

When the rotation gate opens, it triggers an automatic circuit shutdown, ensuring that no functions can operate. Wireline and winch operations can only be performed in conjunction with the "Push To Run" function. This mechanism enhances safety during critical moments and reduces the likelihood of accidents.

### Data-Driven Development

Precision Drilling Australia's commitment to continuous improvement and innovation is evident in the data-driven approach adopted during the PDR05 rig rebuild. Field trials are currently underway with one of the world's largest iron ore tier-one miners in the Pilbara region of WA.

The valuable information and data collected from these trials will inform future

developments and improvements on Rig PDR06, which is set to benefit from the experience gained during PDR05's refurbishment and field testing.

The Precision Drilling Australia's PDR05 rig rebuild marks a pivotal moment in the Australian drilling market.

Through the integration of cutting-edge safety features for "Zero Energy" compliance, Precision Drilling Australia is setting new standards in safety, efficiency and sustainability.

With the dedication to engineering long-term safety solutions and a data-driven approach to development, PDA continues to lead the way in providing innovative and safer drilling solutions for the industry.

The future holds great promise with lessons learned from PDR05's successful upgrade and field trials.

PDA will undoubtedly contribute to further advancements in the drilling sector with the continued improvements being installed to PDR06 in the near future. **AMR**



# Drilling with Precision.

With over 25 years of industry experience, Precision Drilling Australia is a new generation of drillers in WA, providing services in exploration, geotechnical, environmental, hydro and water well drilling.

They understand it's the quality and reliability of the service provided to clients that makes Precision Drilling Australia stand out from the rest.

From start-up junior exploration companies to large corporations, the value of building a strong reputation and dependability is always their priority.

### Get a quote today:

e: [mathew@precisiondrillingaustralia.com.au](mailto:mathew@precisiondrillingaustralia.com.au)

p: 0425 479 150



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## Automatic Parts Cleaning System for all your Mine Maintenance Requirements

**Robowash has been supplying its unique cleaning system to the mining, maintenance, engineering and automotive industries for 25 years.**

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Nuts, bolts, plastic or rubber seals, washers, bearings, alloy components, transmissions, brake and clutch parts, engine blocks or complete engines, electrical components including armatures, stators, rotors and electrical wiring harnesses.

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- 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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# A Cut Above the Rest

**H**D 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
- Bevelling – 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

**LASER CUTTING**

**PLASMA CUTTING**

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**ANCILLARY SERVICES**

**STEEL PLATE**

**PHONE: +61 08 9418 8462**

**www.hdplasmacutting.com.au**

81 Discovery Drive, Bibra Lake WA 6163

Email: sales@hdplasmacutting.com.au



# QUALITY DRILLING AND SAMPLE RECOVERY

**R**aglan Drilling has the capacity and capability to work around Australia with 18 rigs specialising in RAB, Air Core, Reverse Circulation, Diamond, Auger and Lake Drilling.

The company has come a long way since 2006, when brothers Hugo and Gus Lacey started out with a one air-core rig in Kalgoorlie, WA.

Fifteen years later, Raglan Drilling has become well-known for delivering high-quality sample recovery and safe exploration drilling services.

Raglan Drilling director Gus Lacey started out in the mining industry as a geologist and has experience running resource definition programmes, grade control drilling, grade control modelling and ore extraction.

"With drilling experience from both sides of the industry, Raglan Drilling understands issues relating to poor sample recovery, hole deviation and the effects on resource estimation, head grade, block model calculations and dilution," he said.

His brother Hugo started as a driller's off-sider for McKay drilling and worked his way through to a driller in record time.

Hugo is also a competent RC & AC driller who provides a wealth of knowledge in all aspects of air drilling.

"Our long-term clients include AngloGold Ashanti, Apollo Consolidated, Breaker Resources, Horizon Minerals, Lefroy Explora-

tion, Nexus Minerals and St Barbara," said Gus.

"We strive for effective and clear communication to ensure the best outcome for every drill program."

With dedication and a 'can do' attitude, Raglan has gained a reputation for strong client relationship and satisfaction amongst a crew of 80 people.

Raglan Drilling's commitment to the health and safety of its employees and the protection of the environment is demonstrated by four-plus years of ISO accredited systems.

The list of equipment that Raglan Drilling provides includes a fleet of modern Deep Hole RC rigs, Deep Hole Diamond and fully mobile small foot-print Air Core rigs.

With 10 years of Salt Lake Drilling, Raglan offers a full suite of drilling disciplines and specialty skills for those "hard to reach" exploration targets.

Raglan Drilling also supplies complete remote camp setups with either Explorex-type caravans or transportable buildings.

Every three months, Raglan Drilling holds geology lectures with the Goldfields geoscientific community in Kalgoorlie, WA.

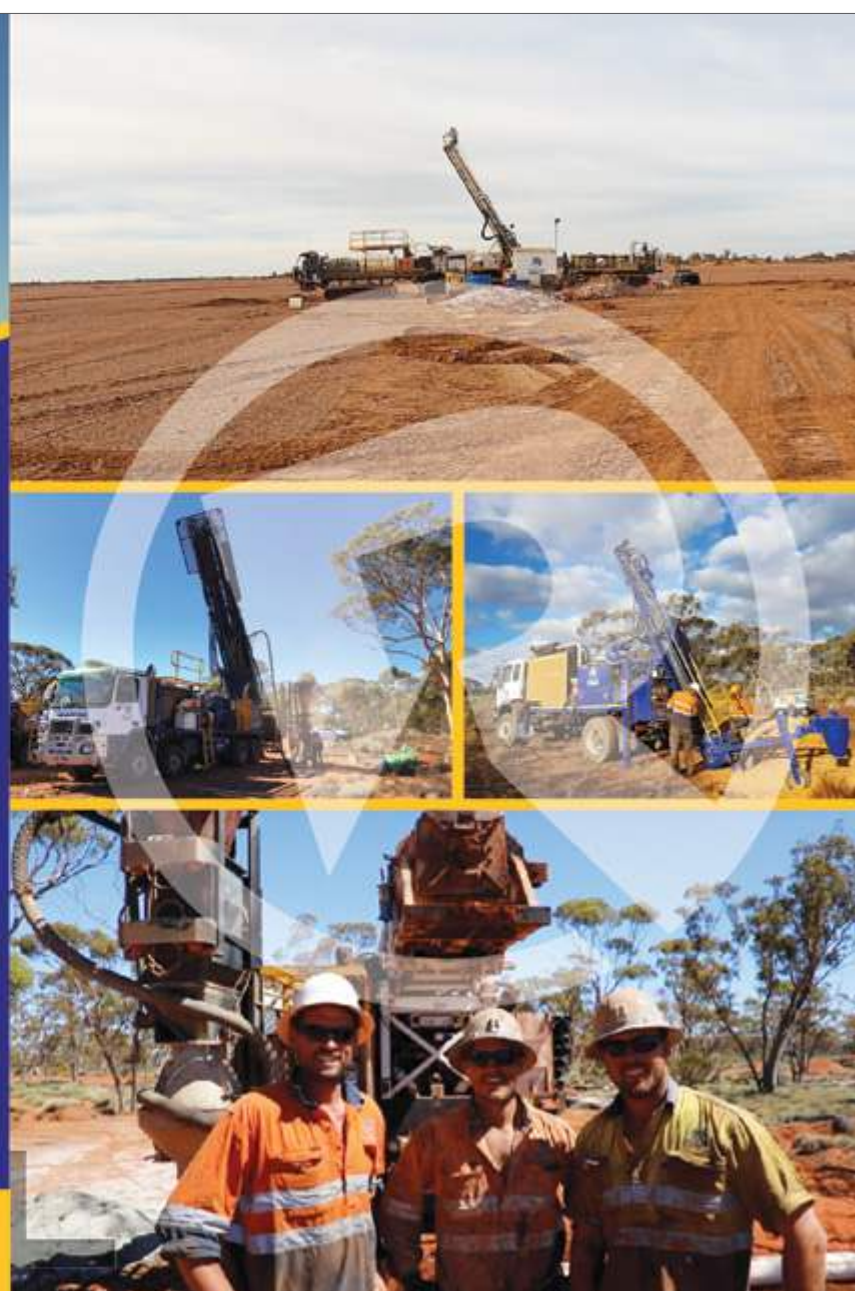
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# A TRUSTED LIFELINE FOR REMOTE SITES.

**E**stablished in 1989, Laverton-based Desert Sands Cartage specialises 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.

Desert Sands also offers earthworks and mobile and on-site concrete delivery to clients for various construction projects.

In response to increasing demand for portable concrete supply and delivery, Desert Sands Cartage recently increased its capabilities by adding a Porta-Batch mobile concrete batching plant to its fleet, with a 50-tonne cement silo.

The batching plant can produce more than

32 cubic metres of concrete per hour and can be deployed at most remote locations in the Outback.

This is one of two similar batching plants Desert Sands Cartage has put to work to supply large-scale construction projects in remote areas.

#### Servicing Remote Regions

Desert Sands director Rex Ryles says his company can mobilise to remote locations to service its clients, whether it be to batch and deliver concrete using its new Porta-Batch plant, deliver earthworks materials and services, alongside many other services for mining, civil, and local government projects.

"We can also provide potable drinking wa-

ter for personnel mobilised on-site for all stages of the mining process, for example, exploration, earthworks, and construction phases," he said.

"No matter where your site is located, we travel far and wide to ensure you and your staff are looked after and have a reliable source of drinking water."

No job is too big or too small for Desert Sands Cartage, with clients ranging from the local Shire to larger operations such as Gruyere gold mine, Anglo Gold Ashanti sites, and various other large-scale mining projects.

#### A Range of Cartage Solutions

Desert Sands Cartage Contractors provide services including but not limited to:

Side tipper haulage, mobile batching plant/concrete delivery, supply and delivery of potable water alongside diesel and petroleum fuels, screened sands, river rock and blue metal materials.

Other services include maintenance grading, road building, site works, construction and excavator and loader-work.

Desert Sands can also provide contract screening, semi-drop deck hire, front-end loader hire, road maintenance and constructions for local government organisations, general civil works, bulk tipper haulage and much more. **AMR**

For more information, visit  
[www.desertsandscartage.com.au](http://www.desertsandscartage.com.au)  
or call +61 8 9031 1326



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Lot 501 Cox Street Laverton WA 6440





# MOXI AND MARTEQ

**L**ong experience, flexible training courses and relevant, practical teaching from skilled industry trainers are what set MOXI apart as the leading registered training organisation for the Oil and Gas, Mining, Minerals, Utilities and Infrastructure sectors.

Based in Australia, MOXI provides training courses and training services both nationally and internationally.

In all training, the mission is to Reduce Risk, Demonstrate Competency and provide Training Management Solutions for all their industry clients, both large and small.

## Industry Training Provider Meeting Demand

Stricter corporate governance and regulations for many industries has seen an increase in the demand for accredited competency-based training, technical and commercial due diligence, and independent verification services.

MOXI's trainers ensure that all courses deliver up-to-date training which complies with the latest industry standards and work place requirements.

This includes local, state and federal regulators, state authorities and agreed national competencies.

## Continually Improving

As a leading industry training provider, MOXI is constantly developing new strategies, competency-based programs and training to better service potentially hazardous working environments such as in the Oil and Gas and Mining Industries.

Internet technology is also changing the method of delivering the best training, where their new e-Learning facility which offers flexible training options for all clients, the world-over.

## Customised Training

MOXI can customise training to meet your specific work place and industry requirements.

Offering diverse training options and flexible delivery based on best-practices.

We look at the broad scope of your company's strategic plan and goals, employees' job roles and potential career paths, while also factoring in practical things like your current work schedule, staff availability and workplace location.

## World-class Training Material

Sourcing the best available training solutions from local and international industry training providers.

MOXI's Alliance Partners are established training providers with world-class material which can be adapted to suit local standards and industry regulations.

## Professional Trainers and Assessors

MOXI's strong team of professional trainers have worked across a range of industries including, Oil and Gas, underground Coal Mining, Safety Management, Power Generation and Electrical Design.

From their own experience, they understand what you need to get the job done efficiently, while satisfying safety requirements and industry regulations.

Why not make MOXI your preferred registered training organisation for all your

competency training requirements? Don't sweat over compliance in industry, be proactive and train your staff well.

As an experienced industry training provider, MOXI will take you through, step-by-step, in the development of a complete training program for your company that meets both immediate and ongoing training needs.

The well-established company MOXI partnering with verified Indigenous supplier Company Marteq Energy Pty Ltd established within the Pilbara region have become sought-after within the domestic mineral resources sector for their auditing, inspection, classification, and design support capabilities, underscored by years of industry experience.

With locations in Australia, New Zealand and Asia, the company a globally recognised training course and professional services provider offering contemporary practical education for the mining, oil and gas, utilities and infrastructure sectors.

Marteq Energy is a leading Project Delivery and engineering consultancy company servicing the mining, power generation, oil & gas, industrial infrastructure sectors, Marine engineering, and Project management for onshore mining as well as subsea and offshore oil & gas industries.

MOXI is a customer service oriented Service company perpetually seeking to provide timely and quality solutions to meet the customer's requirements.

To provide the best possible solutions to our clients through their full spectrum of electrical design, power studies and model-

ling, build and on-site services in the mining industry.

Marteq Energy are experienced in all stages of project delivery from conceptual Project Engineering, design and drafting through to site installation and commissioning of a range of plant and equipment.

Their project delivery capabilities and experience include and are not limited to; Project Execution Strategy and Management, Site Construction and Commissioning Support – NPI Logistic Access and v Final Documentation, Project Handover, Lessons Learned and Close Out.

Marteq Energy has excellent vendor relationships with multiple technology partners in various industries, this has benefited their associations and expertise with ventilation, logistics, generators, pipes and consumables businesses.

The Procurement with Marteq Energy extends to Rental and Hire equipment, featuring; Air Compressor's, Earth Moving, Trailers & Welding, Site Accommodations /Cabin and plenty more.

MOXI and Marteq Energy have a new strategy to better serve their respective clients in WA and in particular the Newman area.

AMR

**moxi** / HA SERVICES  
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**Marteq Energy**



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THE AUSTRALIAN  
MINING REVIEW





# CONCEPTION TO BEYOND

## ENHANCING ESG COMPLIANCE THROUGH DURABILITY AND MATERIAL ENGINEERING

**R**esource extraction plays a vital role in any mineral processing operation. Savvy asset owners have come to realise the true value of adopting a comprehensive lifecycle approach for sustainable operations that meet strict Environmental, Social, and Governance (ESG) standards and specifications.

The conventional 'cradle to the grave' perspective must be replaced with 'conception to beyond', emphasising the significance of durability and material engineering in ensuring long-term viability, responsible resource management, and a reduced environmental impact of mining structures.

### Conception & Design Phase

Material selection takes centre stage in meeting ESG standards within the conception and design phase of mining structures. Selecting materials with high durability, recyclability, and low environmental impact is essential. Attractive options such as advanced composites, sustainable concrete mixes, and reclaimed materials, strategically align with ESG goals.

Incorporating a Life Cycle Assessment (LCA) during the design process allows mining companies to evaluate the environmental implications of various material choices, further facilitating informed decision making that promotes responsible resource management.

### Construction Phase

During construction, innovative construction techniques and technologies can be deployed that enhance the structural integrity and durability of mining infrastructure. Implementing eco-friendly construction practices, such as modular

construction and prefabrication, not only expedites the process, but also minimises the environmental impact by optimising material usage and reducing waste generation. Stringent quality control and adherence to ESG standards ensure mining structures are built to withstand harsh operating conditions, whilst lowering their environmental footprint.

### Operation & Maintenance Phase

The operation and maintenance phase plays a critical role in upholding ESG standards and maximising the longevity of mining infrastructure.

Regular inspections and proactive maintenance serve to identify potential issues early and allow personnel to implement remediation measures in a timely manner.

Prioritising responsible maintenance practices allows mining operations to minimise environmental disturbances, reduce waste, and mitigate potential risks that could jeopardise their ESG principles.

### 'Beyond' – Circular Economy & Material Reclamation

The 'beyond' phase marks the end of a structure's operational life, however not the end of its value. Adopting circular economy principles allows mining companies to unlock the value of materials at the end of a structure's lifecycle. Promoting material reclamation minimises waste generation and reduces their ecological impact.

Responsible deconstruction and reclamation techniques recover valuable resources from decommissioned mining struc-

tures, subsequently creating a closed-loop system that aligns with ESG standards.

### Responsible Resource Management

As the durability consultants on some of Australia's largest projects, BCRC are renowned for providing practical solutions that are designed to minimise lifecycle costs, while ensuring reliable and safe operation of structural assets, whether they are still on the drawing board, or close to the end of their service life.

According to BCRC General Manager, Marius du Preez, the pursuit to achieve high ESG standards within the mining industry requires a proactive integration of sustainability and responsible resource management at every stage.

"At BCRC, we leverage the best minds in the business as well as unique technical skillset covering a range of specialty fields including sustainability," he said.

"In the conception and design phase of a project, we bring experience in durable materials selection, the application of advanced engineering techniques, and conduct lifecycle assessments to optimise the environmental performance and resource efficiency of our clients' operations."

The construction phase is also one that demands this level of expertise as environmentally-conscious practices combined with stringent quality controls guarantees both infrastructure longevity and its positive impact on the surrounding environment.

Mr du Preez highlighted that by collaborating with BCRC, asset owners would receive

the added confidence that their projects will adhere to the highest environmental standards and contribute to a more sustainable future.

"If we look at the operation and maintenance phase, BCRC plays an integral role in promoting ESG-compliant practices, which are essentially tailored maintenance strategies that increase structural performance and operational efficiency, whilst reducing a site's carbon footprint.

"Additionally, embracing circular economy principles and material reclamation in the beyond phase demonstrates the dedication to sustainable practices by mining companies. Our expertise ensures valuable resources are reclaimed and repurposed, minimising waste and contributing to a closed-loop system."

With the right material selection advice, engineering and sustainability expertise, BCRC continues to help clients establish a 'conception to beyond' approach leading to sustainable, ESG compliant mining operations over the long-term. This enables companies to prioritise durability and material engineering at each phase of their projects, providing responsible resource management, extended infrastructure life, and leave a positive impact on surrounding communities.

For more information, visit  
<https://bcrc.com.au/>

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**WAGENER**  
**VULCANIZERS**

# YOUR PARTNER IN PRESSES



**E**stablished in 1897, WAGENER Vulcanizers GmbH & Co. KG is part of the Ziller Holdings Group in Germany which includes NILOS GmbH & Co KG. It is known around the world for the development of high quality and innovative conveyor belt equipment and products for mining and heavy industry.

NILOS and WAGENER Vulcanizers presence in Australia has existed in various incorporations over the past 30 years. The original Nilos Australia company was a steel cord conveyor belt reconditioning business up until 2005. This investment was done in partnership with G&F Beltline Services, a leading conveyor belt service company in Western Australia at that time and a longstanding NILOS partner plus a reputed Venture Capitalist.

In 2021, NILOS GmbH & Co. KG re-established Nilos Australia Pty Ltd in a new organizational structure and with a re-energized focus on promoting its Nilos/WAGENER Vulcanizers Australia product range and technical expertise to provide a value-added supply package to its customer base around Australia.

In 2023, Nilos Australia Pty Ltd was re-named WAGENER Vulcanizers Australia Pty Ltd to align with its key focus to become a leading authority in vulcanizing press equipment in Australia.

At WAGENER Vulcanizers Australia, we understand the critical role that vulcanizing presses play in maintaining the integrity and performance of conveyor systems. Whether for the mining, manufacturing, or heavy industry sector, our German-made state-of-the-art vulcanizing press equipment is designed to deliver unparalleled results, ensuring maximum durability and safety.

WAGENER Vulcanizers Australia also provides specialized cutting equipment (the ROTOCUT) for steel cord and fabric conveyor belts which greatly improves safety and operation efficiency. The ROTOCUT provides increased safety and reduced hazards in the cutting process through the elimination of sparks, cutting debris and burnt gases, as well as necessary hot work site permits.

Our mission is to provide our high-quality vulcanizing press equipment, conveyor belt cutting solutions, and conveyor products together with fast and dedicated technical support so that our customers can maximize their conveyor belt productivity in a safe working environment. **AMR**

**For further information and contact details please view our Australian company websites, [www.nilosaustralia.com](http://www.nilosaustralia.com) and the new [www.wagenervulcanizers.com.au](http://www.wagenervulcanizers.com.au).**



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# AUSTRALIA'S LEADING GROUND SUPPORT SPECIALIST



**W**ith over 40 years' experience, Jetcrete has earned the trust of mining professionals and related industries by providing unparalleled ground support services across the country. Jetcrete's expertise lies in shotcreting, the application of specially adapted materials using cutting-edge techniques. As the largest shotcrete provider in Australia since 1992, the company has set the industry standard for underground shotcrete and fibercrete ground support.

Through collaborations with key industry suppliers, Jetcrete has introduced significant advancements in shotcrete technology, including robotic shotcrete units, hydroscaling for improved mining development efficiency and 3D laser scanners for QAQC thickness verification. With a focus on complete support, they offer a comprehensive range of services to address all stages of underground shotcreting.

From on-site concrete, shotcrete and CAF manufacturing, to supply, delivery and application, Jetcrete's experienced team ensures seamless project execution. They also extend their capabilities to encompass surface and underground civil infrastructure works, including earthworks, machine foundations, drainage and culverts, concrete slabs, heavy workshops and site offices.

Concrete manufacturing is a cornerstone of Jetcrete's operations. Since 2003, it has been at the forefront of the industry, owning and operating 16 batch plants across the nation. This strategic infrastructure ensures access to round-the-clock concrete, CAF and shotcrete manufacturing, enhancing production capabilities, reducing costs and ensuring stringent quality assurance. Collaborating closely with major suppliers, Jetcrete tailors specialised mixes to meet the specific requirements of hard rock mines.

Jetcrete's delivery services cater to even

the most remote and challenging sites. Its fleet of over 95 trucks, including low-profile transmixers and underground-approved concrete trucks, facilitates the timely and efficient delivery of concrete. By providing nationwide coverage, Jetcrete guarantees projects of any scale or location receive the support they need.

With a commitment to safety front and centre, Jetcrete has developed ground-breaking technological advancements to enhance project confidence and effectiveness. By eliminating high-risk tasks and improving worker well-being, Jetcrete's innovations redefine safety standards in the industry. The company's Ready Jet® Drum Blasting system facilitates high-pressure cleaning by enabling remote-controlled cleaning of agitator drums. This eliminates the need for workers to enter confined spaces, minimises hazards and significantly reduces cleaning time.

Jetcrete's comprehensive service offering extends beyond shotcreting and concrete manufacturing. The company's remote

shaft lining expertise eliminates the need for personnel to enter hazardous environments during the lining process. Compliant with AS/NZS 4871 standards, Jetcrete operates in Zone 1 environments safely and efficiently. The company also offers cable bolting services, utilising a multitude of cable bolting units, and employs laser scanning technology for precise shotcrete application thickness measurement. Furthermore, Jetcrete's resin injection services provide additional rock support for underground mining, including stabilisation and anchoring.

In the realm of civil construction, Jetcrete's capabilities cover a wide range of services for both surface and underground operations in remote locations. Jetcrete's civil construction division is equipped to handle diverse projects, including the construction of heavy-duty workshops, mine site offices, machine foundations and slabs, drainage and culverts, earthworks, and high wall stabilisation utilising a modified boom pump as a shotcrete applicator. By offering these services, Jetcrete's clients

receive comprehensive project support, from initial ground support to the construction of essential infrastructure.

Jetcrete's impressive track record and commitment to professionalism have made it the go-to choice. The company's dedication to continuous improvement, technical expertise, and emphasis on safety, have earned it the reputation as Australia's leading ground support specialist.

When partnering with Jetcrete, clients can expect unparalleled support from a team of experienced professionals who understand the unique challenges of the mining industry. The company's extensive experience in all aspects of ground support, combined with its state-of-the-art equipment and focus on training and education, ensures that projects are executed with precision, efficiency and the highest quality standards.

Jetcrete stands out as Australia's premier ground support specialist, delivering complete support from the ground up. With a strong focus on safety, innovation and technical expertise, Jetcrete has established itself as the trusted partner for mining professionals and related industries.

By offering a comprehensive range of services, including shotcreting, concrete manufacturing, remote shaft lining, cable bolting, laser scanning, resin injection and civil construction, Jetcrete has the capability to support projects of any scale and complexity. When it comes to ground support solutions, Jetcrete is the name to trust, providing reliable and efficient services that ensure the safety and success of mining and construction operations in Australia.

For more information, visit  
[www.jetcrete.com.au](http://www.jetcrete.com.au)

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# JASMAN ENTERPRISES

## THE PREMIUM DEALER FOR THOROUGHCLEAN PRESSURE CLEANERS IN WA

**F**or 25 years, Jasman Enterprises have been the premium dealer in WA for the ThoroughClean brand of pressure cleaners.

With a partnership spanning over two decades, Jasman Enterprises and ThoroughClean have been able to supply pressure cleaning and water blasting solutions across the state's mining industry.

They offer a range of products, spares and accessories, provide on-site service across the Perth metro area and carry out custom builds.

These are perfect for any pressure cleaning or water blasting solution that you will find on a remote mining site.

The Australian owned ThoroughClean range is designed, engineered and built in Queensland.

ThoroughClean's mining range of water blasters are designed around heavy-duty steel galvanised frames and come in portable, skid, trailer and wash bay configurations with electric, petrol and diesel options.

All ThoroughClean mining equipment are built with mining approved specifications in mind.

The mining equipment range includes the up to 24 hp 7200 PSI diesel portables, 10 hp and 24 hp single and dual axle trailers, with skid mount pressure cleaners up to 24 hp.

The electric range of pressure cleaners come in portable up to 15 hp. As well as washbay solutions "Washmate", which are 3 HP to 15 HP configurations perfect for small and large equipment washdown bays.

ThoroughClean have been supplying to the mining industry for over 30 years, with customers including Rio Tinto, Glencore, BHP and Newcrest mining to name a few. It's safe to say they understand the tough requirements of mining sites.

Jasman also has a range of accessories available including hoses, hand guns, lances, bypass and safety valves, fan jet and heads and turbo nozzles, pressure switches, chemical injectors, whip socks and couplings and fittings.

**Contact Jasman Enterprises on  
admin@jasman.com.au or  
(08) 9355 0355 to find out more about  
their range of industrial high pressure  
cleaning machines and spare parts.**

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## ThoroughClean and Jasman Enterprises provide Pressure Cleaning and water blasting mining solutions for 25 years.

With a partnership of over 25 years, ThoroughClean and Jasman Enterprises, have been able to supply pressure cleaning and water blasting solutions to the Western Australian mining industry. With all Australian owned ThoroughClean engineered and designed solution.

The ThoroughClean mining range of water blasters are all designed around heavy duty steel galvanised frames, and come in Portable, Skid, Trailer and Wash bay configurations, with electric and diesel mining approved specifications. Perfect for any pressure cleaning or water blasting situation you might find on a remote mining site.

True aftermarket support is available through Jasman Enterprises, situated at Carlisle in Perth. With a wide range of spare parts to suit most brands of pressure cleaners.



Jasman Enterprises  
PTY LTD



# THOROUGHCLEAN

## WATER BLASTERS

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**Email:** admin@jasmanenterprises.com.au

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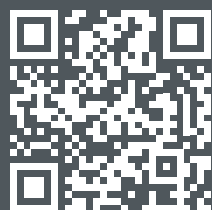
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Henderson, WA, 6166





# A NEW GENERATION OF ZOOMERS

**B**ased in Melbourne's south-east, Gleason Cranes have built a reputation as a cost-effective, reliable service provider in the crane industry.

Providing the Australian market with quality lifting machinery and equipment at cost effective prices for over 50 years, Victoria-based Gleason Cranes is a household name in the crane hire, purchase and servicing industry.

As well as hosting the largest used-crane marketplace in Australia, Gleason Cranes is the national distributor of the Zoomlion, Ormig, and Mi-jack brands.

It's through the Zoomlion brand that sales director Chris Logan sees the most growth occurring in Australia.

Founded in 1992, Zoomlion supplies house-manufactured equipment to over 70 countries worldwide, with Chris underscoring his view that the quality of the Zoomlion product is becoming abundantly clear to anyone paying attention.

"A lot of brands that expanded outside of Asia have successfully completed what Zoomlion is currently doing now," he says. "If you go back to the 70s and 80s, all the Asian brands really struggled with their reputations in Australia."

We know that if we continue supplying a high-quality product to the Australian market, people will continue to see the positive performance of the Zoomlion brand."

Having distributed Zoomlion's products across the Oceania region for the best part of 15 years, the team at Gleason Cranes is well acquainted with the product; and, as Chris says, if the "quality" wasn't there, "we just wouldn't sell it."

With its cranes standing up to the harshest environments across Australia, whether

it be the red and black dust of the mines or the colder climes on the Snowy Hydro project, the Zoomlion brand is standing up.

As a member of the International Standard Organisation, all Zoomlion products are compliant with European, American and Australian standards.

Being the fifth largest construction equipment manufacturer globally, Zoomlion ranked third amongst crane manufacturers in the 2022 KHL Yellow Table for market share percentage, indicative of how their quality is viewed across the world.

Chris and Gleason Cranes are doing such good work with the Zoomlion brand that its expansion is taking. Gleason Cranes is now looking to move into bigger premises to be able to hold the stock that is set to come its way over the coming year.

According to Chris, the company is also looking to invest in floats to transport its products up, down and across the coasts of Australia.

"They're very happy with what we're doing," he says. "Over the next 12 months, we'll have an array of products coming into the country that we'll be able to sell to people, encompassing cranes for all kinds of environments."

Among those cranes are hydraulic boom crawler cranes ranging through 30-tonnes, 60-tonnes, 90-tonnes, 120-tonnes and 150-tonne capacities, and a full range of truck cranes including extras in the 25-tonne, 30-tonne and 55-tonne capacity class.

There is also a new 120-tonne capacity all-terrain crane that is expected to arrive in Australia by September – with Gleason Cranes expecting to take on a range of new rough-terrain cranes ranging from

40-tonne capacity to 110-tonne capacity over the next six months, as well as some crawler cranes with expanded lifting capacities of up to 30-tonnes to over 500-tonnes.

As Chris notes, these cranes were manufactured in parts of the world with high demand for windfarm work and nuclear power stations, and thus will come readily equipped to handle any energy construction work thrown at them in Australia.

Ultimately, Chris wants to ensure Zoomlion distributor Gleason Cranes holds enough stock and spare parts to ensure that, should it be called upon for any servicing, parts, or purchasing needs, they will have the resources on demand to fulfil that service.

"It's a big part of our philosophy when it comes to selling machinery," says Chris. "We want to sell quality equipment at an affordable price, and then provide a post-sale service and support that eclipses all our competitors."

"All of our staff want to work together, and we know if we do that, then we'll sell more cranes because we've provided a good service that everyone's happy with."

For Chris and the team at Gleason Cranes, selling a crane is only one part of the equation when it comes to providing good customer service.

With service centres and support teams stationed across the nation, Chris says that customers know they can not only trust the quality of the Zoomlion brand, but also the back-up support provided by Gleason Cranes accompanying the sale of the crane.

Stories from past editions of Cranes and Lifting substantiate this. Owner of Central Coast-based company NR Cranes Nathan

Randles spoke of how well a 50-tonne Zoomlion had held up when he was working with Tomago Aluminium, and how it convinced him to purchase a new Zoomlion ZTC251V truck crane.

Additionally, Managing Director of LTE Construction Nick Maric was effusive in his praise for his ZCT600V, highlighting its "impressive" performance in piling works and noting the crane's "reliability" – citing his previous experience as the main reason to return to the Braeside-based dealer again for a new crane.

The same recurring themes come to the fore in what these business owners say when discussing the Zoomlion brand and the service received from Gleason Cranes; along with everyone else who's spoken to Cranes and Lifting about their experiences with the team at Gleason Cranes, they were nothing but complimentary about the manner that Chris conducted their sales, the bang for their buck they had received from their Zoomlions, and the practicality of the cranes.

Touted as being a "third-to-half the price of European cranes", Chris is adamant the cost-effectiveness of Zoomlion's cranes is not because of a compromise on quality but, rather, a combination of available stock and cheaper raw materials and labour.

"The quality is right up there," he says. "Any customer we speak to is loving their cranes, irrespective of whether it's a hydraulic crawler crane, truck crane, anything."

"The Zoomlion brand is consistently our best-seller, and that's because of the quality they display." **AMR**



# GleasonCranes

The National Distributor of Zoomlion



With over **50 years of experience** in the crane industry, **Gleason Cranes** has a well-earned reputation for sourcing high quality cranes worldwide.

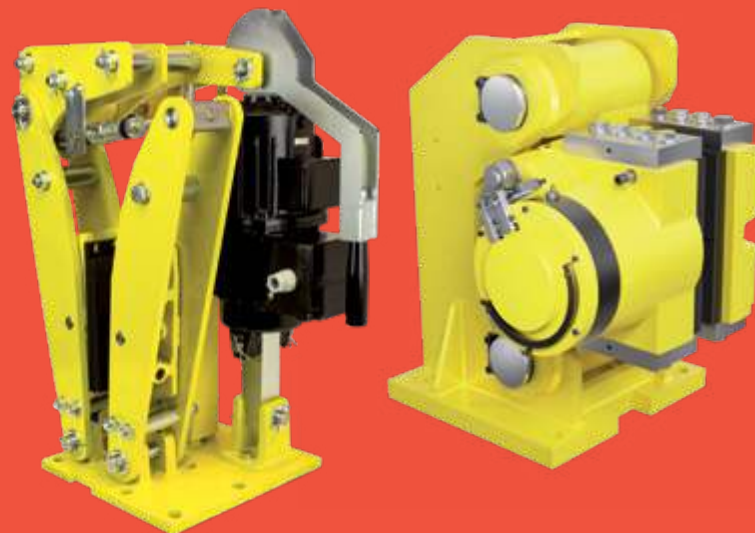
As well as hosting the largest used crane marketplace in Australia, Gleason is the national distributor of Zoomlion.



LEARN MORE



# A One Stop Shop for Mechanical Power Transmission Products



**R**INGSPANN is a leading technology manufacturer of power transmission products such as freewheels, backstops, brakes, clamping fixtures, shaft-hub connections and overload clutches. It also leads in precision clamping fixtures and remote controls. The company has nine manufacturing facilities in Germany and across the globe.

With almost 500 employees in more than 25 countries through dedicated offices and distributing companies, RINGSPANN prides themselves on providing the latest and reliable high tech products to an abundance of customers worldwide in the field of industrial gears and geared motors, mining, machine tools, food and packaging machines, energy generation, material handling, marine, rail, aerospace, vehicle construction, pulp and paper as well as in general machine building and plant construction.

While headquartered in Germany since 1944, the company had been expanding its presence in Australia through other distributors. It made a conscious decision to set up a dedicated Australian office in 2018 located in Melbourne and is now well-established as a leading technology manufacturer with the team there ready to service and tailor their products to suit applications and optimise solutions and will continue to service the market with a mix of existing and new products introduced every year.

## Freewheels

Setting the global standard for almost 50 years, RINGSPANN freewheels of the FXM series launched in 1971 and have become a standard feature on numerous international machines and plant constructions. Precision and compact design

of the internal elements is a pioneering development of the RINGSPANN design and engineering department. They offer low maintenance "fit and forget" solutions on industrial drive trains and being equipped with the legendary "Sprag Lift-Off Type X", they offer low lift-off speeds and wear-free continuous operation and can even be used with friction reducing solid lubricants.

The whole FXM series, comprising of more than 40 standard sizes, have race diameters from 31 to 750mm. Depending on the variant, the torque they generate can range from 110Nm to 1,230,000Nm. They do not have their own bearing support and are typically used as backstops on intermediate shafts of spur gearboxes in conveyor pulley drives or as overrunning clutches in the gearbox units of bucket elevators, automatically engaging and disengaging main and creep drives. The FXM series is continuously being redeveloped and designed to meet the demand of today's applications.

Design and development engineers can find technical data sheets, 3D CAD models and installation instructions for all FMX Freewheels in the company's online portal: [www.ringspann.com.au](http://www.ringspann.com.au).

## Brakes

Under the RINGSPANN brake portfolio the company boasts an extensive range, spanning pneumatic brake calipers, electromagnetic brake calipers, manual brake calipers, clamping units and accessories along with hydraulic and electrohydraulic braking and control systems.

Our spring activated Hydraulic release brake calipers can deliver up to 560kN clamping force. Wind turbines and other demanding mining applications can achieve higher braking forces through RINGSPANN's hydraulic brake calipers.

For the mining industry, RINGSPANN can supply calipers along with a Hydraulic Powered unit (HPU) with pressure valves and regulating PLC's that can be controlled remotely.

Some of the installations in drive technology and machine construction requiring smaller braking torques up to a maximum 8000Nm are covered by RINGSPANN's compact and lightweight electromagnetic disc brakes. The brake calipers from their new series DT, FEA and H-ST are much slimmer in design than conventional industrial drum brakes.

The key reason for this is a constructional variation that saves an enormous amount of space.

The RINGSPANN electromagnetic disc brakes range rank among the essential components of countless drive systems in mechanical engineering and plant construction. It's various DH, D-V, EV and EH series are well received globally for various braking applications. These can be deployed for stopping, control and holding and cover a wide range of braking torques from 94Nm to 6590Nm.

Users can access the RINGSPANN developed online brake calculation tool that is free for anyone after registering on [www.ringspann.com.au](http://www.ringspann.com.au). This tool allows users to determine braking torque and clamping force on a specified disc diameter thus selecting a suitable and efficient braking system for the application.

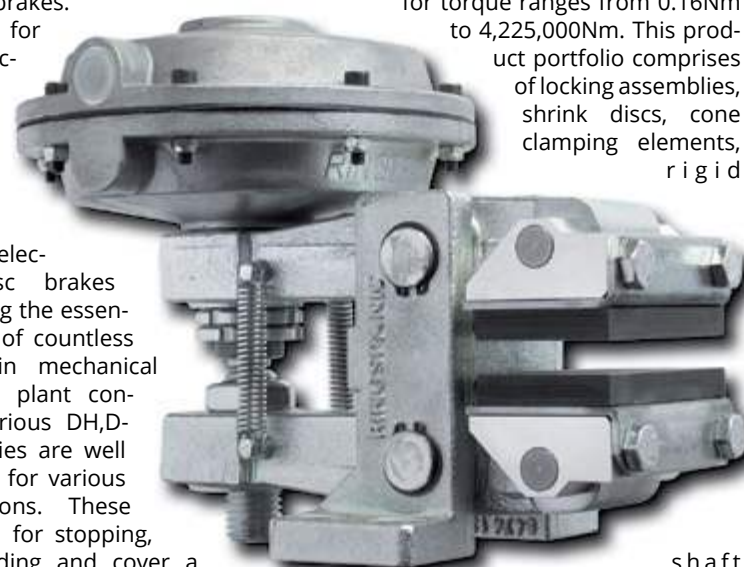
## Locking Assemblies

With a collaboration with universities coupled with decades of practical experience

from key users all around the world, RINGSPANN stays committed and devoted to the ongoing further development of the frictional locking principle.

As a long-time manufacturer of locking assemblies, RINGSPANN possess a well-founded design procedure within this industry and have their own testing facility for fundamental research and quality assurance. The results from here determine and cultivate into a well renowned and extensive line of products currently offering more than 25 shaft-hub-connection series for torque ranges from 0.16Nm

to 4,225,000Nm. This product portfolio comprises of locking assemblies, shrink discs, cone clamping elements, rigid



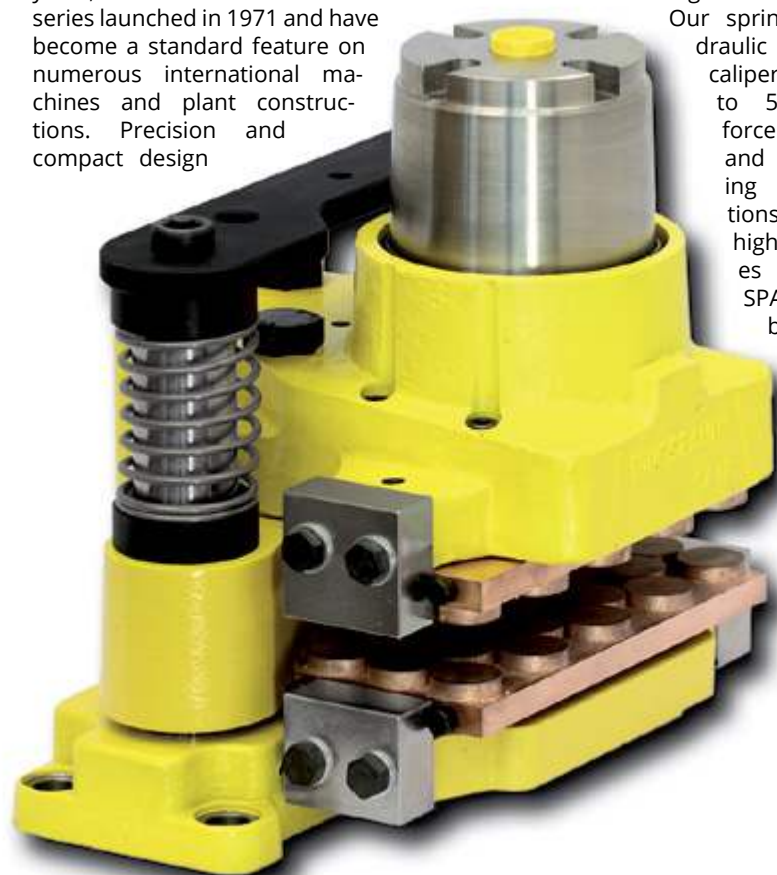
shaft couplings as well as clamping systems for mounting torque motors.

RINGSPANN's three-part shrink discs were introduced to the successful standard series RLK603 S which are ideal for conveyor systems, stirrers, mixing plants, construction machinery and wind turbines, offering powerful externally clamping connections for the play-free connection of hollow shafts with their extremely high torque capacity across a range from 18Nm to 156,700Nm. **AMR**

## Custom-made Solutions

Australian miners have also turned to RINGSPANN for its custom-made solutions. Its not just about supplying standard products but supplying solutions. Customers can talk to RINGSPANN about their applications and what they require and the team can assess and provide a solution to meet the customer's needs. This may include interaction with the finest industry engineers and designers in the world that are part of the RINGSPANN family and they will reach to great heights to provide the best solution to the application.

RINGSPANN will continue to strengthen its foothold in the Australian and Global mining as well as the manufacturing industries. Whether their solutions are made in Germany or in RINGSPANN factories worldwide, we offer the same quality and uniform engineering standards, which is our strength.





# RINGSPANN®

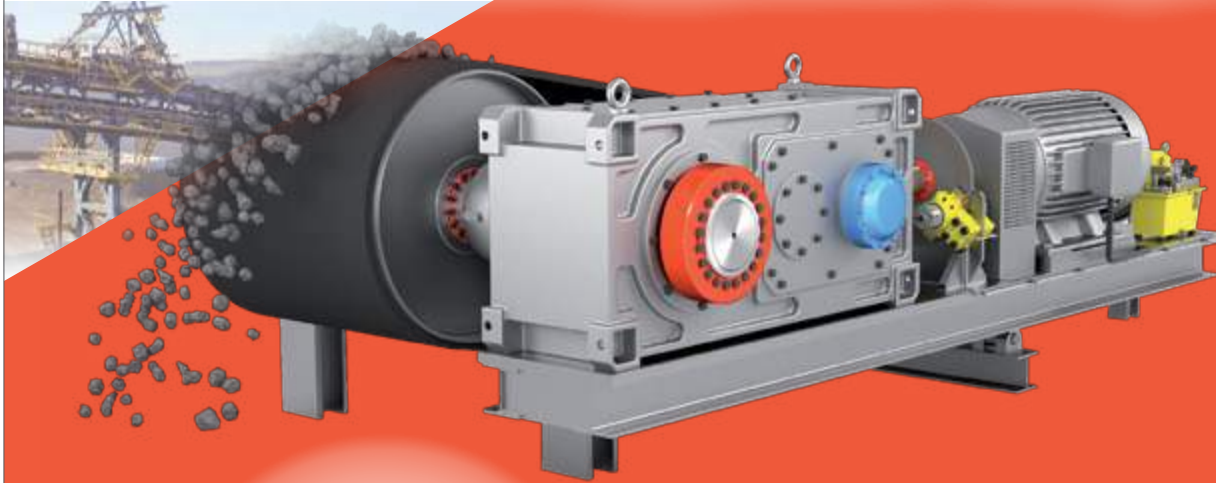
Your benefit is our motivation

## Power Transmission Equipment for Conveyor Pulleys



### High Speed Backstops

Installed on gearbox to prevent reverse motion



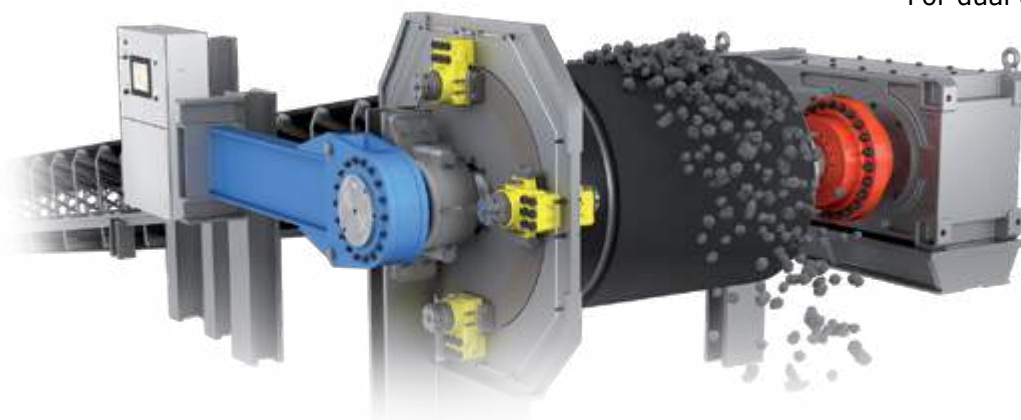
### Low Speed Backstops

Installed on conveyor pulley end to prevent reverse motion



### Housing Freewheel FH

For dual drive applications



## ABOUT US

RINGSPANN® is a leading manufacturer of power transmission components for belt conveyors, bucket elevators, bucket wheel excavators, stackers and reclaimers, for mine hoists and crushers.

RINGSPANN® high speed backstops integrated into the intermediate shaft of gearboxes have long since become a benchmark of drive trains in the Australian mining industry. Equipped with the now legendary

sprag lift-off type X, they impress with maximum torques of up to 1,230,000 Nm, low lift-off speeds and wear-free continuous operation.

RINGSPANN® is also a quality supplier of Low Speed Backstops, for nominal torques up to 900,000 lb-ft and bores up to 21 inches.

Our Low Speed backstops with torque arm support and Taconite

seals on the conveyor pulley side are designed for use in inclined conveyorbelt, elevators or pumps.

Our products also include freewheels, brakes, shaft-hub-connections overload clutches and couplings.

Contact us in Australia for any of our product lines. Our Technical team is available to discuss your application requirements.

GERMAN  
ENGINEERED

**RINGSPANN® Australia Pty Ltd**

[www.ringspann.com.au](http://www.ringspann.com.au)





# AUSTRALIA'S FIRST CHOICE FOR MINING AND CONSTRUCTION TRAINING

**B**ased in Melbourne's south-east, Gleason Cranes have built a reputation as a cost-effective, reliable service provider in the crane industry.

Australian Training Management is the preferred provider of CICA (Crane Industry Council of Australia) for facilitating the new Mobile Crane operations certificate 3 with skill set, which has been developed to bring and keep skilled people in the crane industry.

This course comprises of 23 unit of competencies and encapsulates dogging up to intermediate rigging and cranes up to 100 tonne along with a variety of other key learnings to support safe crane operation.

In the mining and construction industry, proper training and certification is integral in preparing individuals for the demands of the modern worksite and the unique applications faced within their respective trades.

Whether it's maintaining plant equipment, crane operation, drilling and blasting activities, surface extraction, resource processing, engineering or geological surveying, the right skills and qualifications are a must.

Australian Training Management (ATM) is a West Australian owned and operated Registered Training Organisation that specialises in the design and delivery of quality, flexible and cost-effective training solutions for the mining and civil construction industries.

With a passion for training, and a 'learner first' approach, the company has broken the mould when it comes to delivering training packages to meet the skills required to perform confidently, safely, and productively in heavy industrial environments.

Initially starting out as Earthmoving Industry Training Services in 1989, ATM was incorporated as a company on 1 July 2000 to provide training for the unique needs of the earthmoving industry where little private training existed at the time.

34 years later, ATM has become a proven specialist in the provision of high-risk work licensing, construction safety, Main Roads Accreditation, plant operator training, apprenticeships and traineeships.

They are also experts in providing nationally recognised training qualifications, in-

cluding Recognition of Prior Learning (RPL) and Verification of Competencies (VOC).

The company's training courses are not only contextualised for these industries, but they are developed with the flexibility that mining and construction demand.

According to ATM General Manager, Aaron Leafe, whether you are up-skilling, changing career path, trying to break into a new industry, or wanting to challenge and develop your professional skills, the company offers a full suite of training solutions.

"We offer a flexible training schedule of short courses that are fully integrated into the mining and civil industries," Mr Leafe said.

"Our trainers are well equipped to provide the necessary skills and knowledge

required to perform your specific trade correctly, safely and compliantly.

"Additionally, if you're looking for a highly professional, motivated RTO with best-in-class trainers, industry experience, and intellectual capital, ATM is the obvious choice." The delivery of high quality training programs and enhancing clients' capability and business operations remains the core focus of ATM.

At ATM, safety training isn't a job. It's about reputation, one that was built on quality training above all else.

Mr Leafe commented that the company continues to evolve its product offer in accordance with changes in Workplace Health and Safety legislation, as well as progression in mining and construction techniques.

"We achieve this through active consultation with clients, listening and taking onboard their valuable input, and in-turn creating an inclusive, fun and safe learning environment.

"Our clients can be assured that the training that they, or their staff receive, will not only equip them with the skills required to work safely and productively, but students will also be able to work with the confidence that they can apply their learnings as a valued team member."

**For more information, visit**  
**[www.australiantraining.com.au](http://www.australiantraining.com.au)**

AMR

## ATM provide clients with a suite of scheduled training courses

- On-site training and assessment Australia-wide
- Mobile Assessment Platform (APP based tool to conduct on-site assessments for ATM partners)
- Traineeship and Apprenticeship Delivery, including Skills Recognition
- Government Funded Training (Construction Training Fund Bulk Billing)
- Training Course Design and Development
- Training Centre and Venue Hire





# Quality, flexible and cost-effective training solutions across a range of specialist areas

**ATM** have 50+ short courses available across multiple categories, that can be delivered at either of their training centres, or on-site to reduce workplace disruption.

## General Safety Training

- Whitecard
- Tilt Up Construction
- Supervise Tilt Up Construction
- Carry Out Basic Demolition
- Provide First Aid
- Provide CPR
- Low Voltage Rescue and Provide CPR
- Fire Equipment Test & Tag
- Fire Extinguisher
- Fire Warden (Inc. Fire Extinguisher)

+ MANY MORE

## High-Risk Work

- Operate a Forklift
- Elevating Work Platform
- Scaffolding (Intermediate Level)
- Dogging
- Rigging Basic Level
- Rigging Intermediate Level
- CN Crane
- Slewing Crane (up to 20 tonnes)
- Slewing Crane (up to 60 tonnes)
- Slewing Crane (up to 100 tonnes)

+ MANY MORE

## Plant Operator Training

- Package Deals
- Roller
- Water Truck
- Articulating Haul Truck
- Skid Steer Loader
- Front End Loader
- Materials Handler
- Excavator
- Grader
- Dozer

+ MANY MORE

## Keen to start upskilling?

Reach out to **Australian Training Management** to find out more and book your course today.

**+618 9274 1277**  
**info@australiantraining.com.au**  
**www.australiantraining.com.au**

## Locations



West Swan Training Centre  
 52 Harrow St,  
 West Swan, WA 6055



Jandakot Training Centre  
 2/35 Biscayne Way,  
 Jandakot, WA 6164





# MANAGING A SILICA DUST EXPOSURE CONTROL PLAN

**T**ennant Company has a long history of innovation, manufacturing a commercial and industrial range of cleaning equipment solutions dating back 150 years.

## What is RCS?

Respirable crystalline silica (RCS) dust is created by cutting, sawing, grinding, drilling and crushing silica producing materials. Crystalline silica is essentially quartz and mainly found in stone, brickwork, sand and concrete manufacturing industries.<sup>1</sup> In particular, challenging environments like mine sites, wharves and heavy vehicle workshops struggle with silica dust.

## Why it's important

In 2011, about 587,000 Australian were exposed to silica dust whilst working, and an estimated 5728 of these workers will develop lung cancer over the course of their life.<sup>3</sup> Respirable crystalline silica exposure poses a health risk to employees, but in many work environments, it's notoriously difficult to control.

## The Need for HEPA Solutions

Exposure to dust, especially silica dust, is a serious hazard to the health and well-being of employees. And state government

protocols have been implemented keep businesses safe and minimise environmental impact.<sup>4</sup>

Tennant industrial sweepers are often described as the Rolls-Royce of sweepers known for their quality, reliability and durability.

Tennant has a range of High Efficiency Particulate Air (HEPA) enabled industrial sweepers, ranging in size from the **S10** walk-behind sweeper to large, cab-equipped models like the **S30** and the **800** models.

Many of Tennant's larger rider sweepers come standard with a unique combination of control features like the SweepMax® plus cyclonic air filtration system, ShakeMax® 360 orbital shaker and Thermo-Sentry™ hopper temperature sensor.

At the heart of the Tennant sweeper is a 2-speed sweeping technology and the quad filtering system. The fifth stage is the available HEPA dust filter, a supplier tested and certified filter providing a filtration efficiency of 99.97% to 0.3 microns. Dry sweeping with an additional final-stage HEPA filtration system coupled with dust

suppressions skirts is an alternate method in applications where other methods, such as wet sweeping, are not feasible.

Proper usage and maintenance practices will help increase the effectiveness of the machine's filtration stages and the life of the HEPA filter.

WA Territory Sales Manager and 20-year industry veteran Adrian Taylor has deployed HEPA filter enabled sweepers across some of the harshest environments in the country that have included mining, fabrication and processing sites.

"Servicing is key to uninterrupted performance. With one of the largest direct service fleets in the industry, the Tennant-True® service and maintenance program is genuinely the gold standard," he said.

Tennant's tools and technologies can play an important role in helping to manage the silica dust challenge and work towards Occupational Safety and Health Australia (OSHA) compliance. For example, an available HEPA-pressurised cab (with heating/cooling), can be fitted for additional operator protection with a digital gauge and alarm. This ensures pressure in the inside

of the cab is monitored for the operator and remains greater than the pressure outside of the cab.

"We take a lot of pride in ensuring that the machinery recommended for a site meets customer expectations. Our machines are built to last, and we offer a range of optional innovations and technologies to enhance their performance and longevity.

To support customers throughout the lifecycle of the machine, we provide free operator training on-site for the life of the machine. This training ensures that your operators are competent in using and maintaining the equipment, maximizing its efficiency," Mr Taylor said.

Tennant offers three types of dust control methods that can be used to support WHS silica (RCS) control housekeeping requirements. To learn more about Tennant Australia's silica dust solutions, go to our Silica dust web page or reach out to our customer service team.

VISIT: [www.tennantco.com.au](http://www.tennantco.com.au)

CALL: 1800 226 843

EMAIL: [contactus@tennantco.com](mailto:contactus@tennantco.com)

AMR



# SILICA DUST

## SOLUTIONS

DRY SWEEPING

WET SWEEPING

WATER FLOODING



MAINTAIN  
AIR QUALITY



HELP MAINTAIN  
WHS COMPLIANCE



CREATE HEALTHY  
ENVIRONMENTS

## SUPPORTING EXPOSURE CONTROL PLANS

Tools and technologies to support silica dust exposure control plans and help you work toward WHS compliance



TENNANTCO.COM.AU



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- Safe-T Conveyor Safety
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- Carroll Cable Terminations
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- Giovenzana Switches & Pendants
- IMO Automation Products
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# DUST SUPPRESSION

## ON OPEN CUT MINE SITES

**O**pen-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](http://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](mailto:sales@coolmist.com.au)

or visit our website:  
[www.coolmist.com.au](http://www.coolmist.com.au)

**CoolMist**  
SYSTEMS AUSTRALIA



# DON'T LET YOUR EFFICIENCY BLOW AWAY.

MARTIN ENGINEERING  
HELPS YOU ELIMINATE  
THE FUGITIVE DUST FOR  
A SAFER AND CLEANER  
OPERATION, KEEPING  
YOUR CONVEYOR  
SYSTEM AVAILABLE  
AND RELIABLE.



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**1300 627 364**



# YOUR MASTERS OF MACHINING



**M**etro Machining in Victoria is known as the go-to company for everything and anything to do with on-site machining, line boring and equipment repair – so there's no surprise on the cards when you find out they handle jobs as large as bucket wheel excavators, and work on diesel engines in remote power stations.

Metro machining currently has 4 mobile line boring trucks on the road.

With clients throughout Australia and overseas, jobs have included work done for power plants in Nauru and the Marshall Islands.

Closer to home, as well as specialising in line boring and associated machining, Metro provides on-site and workshop services to the industrial repair and maintenance industry, and also offers liquid nitrogen services and supply.

Metro team members have specialised skills which enable them to complete complex refurbishment and maintenance projects; they have the ability to work on heavy equipment in the workshop or while it's still in the field, delivering significant

savings to plant operators by greatly reducing the equipment downtime.

#### In-house workshop capabilities include:

- Line boring
- Turning (up to 5m)
- Milling (6m type bed)
- Horizontal and vertical boring machines
- 200t press
- Slotting
- Boiler making, fabrication and repair

#### On-site machining services include:

- Line boring
- Inside diameter rotary welding
- Milling
- Flange facing
- Key way cutting
- Outside diameter turning
- On-site hole drilling and tapping
- Stud removal

Metro Machining strives to provide a professional, cost-effective service, regardless of the size of the job. Regularly undertaking repair and maintenance work on a wide range of plant equipment.

**For more information visit**  
**[www.metromachining.com.au](http://www.metromachining.com.au)**

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## METROMACHINING

**WE ARE YOUR**  
**ON-SITE MACHINING,**  
**LINE BORING AND**  
**EQUIPMENT REPAIR**  
**SPECIALISTS.**

- ✓ REPAIRS & REBUILDS
- ✓ EXPERT TECHNICIANS
- ✓ MAINTENANCE & MANUFACTURE



LEARN MORE

PAT: 0408 638 549 | KARL 0402 256 874

**[www.metromachining.com.au](http://www.metromachining.com.au)**



AAXXA Group would like to inform its clients that it has taken over Regal Engineering & Line Borings' Pilbara operations. Nothing has changed except the name and we will continue to deliver the same service that Regal Engineering had done.



## DELIVERING THE SAME HIGH QUALITY SERVICE

**A**AXXA Group Pty Ltd's long established Line Boring department specialises in ID welding of bores, machining back to manufacturers tolerances, repairing faces and fitting new bushes to bring equipment back to better than brand new.

The Line Boring department is made up of a team of experienced professionals in the field who have all the knowledge and skills to give clients confidence the project will be done right the first time.

Completing repairs on all types of mining

fleet, both above and below ground, no job is too big or too small for AAXXA Group.

With 5 mobile state-of-the-art Line Boring units at hand and team members across the Pilbara, Goldfields and Perth areas, we can ensure our clients are up and running more efficiently with less downtime. We cater for simple procedures all the way through to more complex projects that require a specialist skill level, focusing on repairs, heavy welding repairs, precision machining and general fitting services.

We make line boring operations faster and

easier, with reliable and strong services to enable projects are completed on time. That's the AAXXA experience.

### API Bushes & Pins

AAXXA Group are proud to announce it is now the WA distributor for API bushes and pins, with a large range to suit all clients that are high quality and made to achieve optimised performance.

We cater for:

- Hitachi Bucket Bushes to suit EX2500 to EX5600 machines
- Hitachi Boom and Stick Bushes to suit

- EX3600 to EX5600 machines
- Hitachi H-Link tipping link Bushes to suit EX2500 to EX5600 machines
- Cat -Terex Bucket Bushes from RH130/6030 to RH340/6060 machines
- Cat -Terex Boom Bushes to suit RH340/6060 machines
- Cat-Terex Stick Bushes to suit RH170/6040 to RH340/6060 machines
- Cat-Terex H-Link Tipping Link Bushes to suit RH170/6040 to RH340/6060 machines
- Liebherr Bucket Bushes to suit 9350/ R994 to R998/9800 machines
- Liebherr Boom Bushes to suit 9350/994 to 996 machines
- Liebherr Stick Bushes to suit 9350/994 to 9088/998 machine
- Liebherr Dog Bone Lever Bushes to suit 996 to R998 machines

Get in touch with Brett Royle (0418 944 403 or [brett@aaxxa.com.au](mailto:brett@aaxxa.com.au)) or Lucas Giannangelo (0455 310 000 or [lucas@aaxxa.com.au](mailto:lucas@aaxxa.com.au)) for all your Line Boring requirements.

For all API Bush Enquiries email [sales@advancedpi.com.au](mailto:sales@advancedpi.com.au) for information.

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# THE ONE TO FIX IT ALL

**W**orld leader in the machine tools market since 1991, the Italian company Sir Meccanica specialises in the production of portable machine tools for multiple on-site operations.

These include in-line boring, overlay welding, flange facing, turning, threading, drilling and tapping.

The company offers a wide range of products where Italian quality, reliability, cutting-edge technology and unparalleled performance merge together.

#### ADVANTAGES

Sir Meccanica's machine tools are widely known for changing the way on-site interventions are done.

This is mainly due to their unique features:

- Portable
- Easy-to-use
- Customisable

- No advanced technical background needed
- CEE certified
- Electronically synchronized for safe use

#### SIGNIFICANTLY REDUCED DOWNTIME

Sir Meccanica's portable machine tools have been designed to work directly on-site, reducing 85% of downtime.

This allows customers to significantly cut their labour and transportation costs as they simply mount the machine tool on the piece that needs to be machined, without disassembling the whole equipment.

With only one machine tool and one single set-up any worn hole is brought back to its original dimensions.

Moreover, the company guarantees qualified assistance and complete support based on customers' needs, fast delivery and worldwide presence thanks to its official distributors' network. **AMR**



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## LINE BORING INNOVATION APPLIED TO CAT HAUL TRUCK TAPERED STEERING COMPONENTS.

A revolutionary line boring innovation and 3rd party certified patent, developed by Morgan Engineering, is reducing maintenance costs and mine site equipment downtime.

The ultra-class trucks used in the mining industry make light of the toughest work. But they are also subject to wear and require regular repairs and maintenance.

The pin bores of almost every hydraulically operated machine must eventually be reclaimed with weld and machined back to a tight OEM tolerance – all while remaining in perfect alignment with all the other bores in that articulated joint.

These bores serve as the locating and pivot points for the steering mechanism. They are subjected to enormous stress as huge hydraulic loads change the angle of the front wheels to provide steering for trucks that can weigh over 400 tonnes.

Steering wear in haul trucks is simply unsafe.

In the past, the only way to repair the tapered steering bores was to remove the entire steering box from the chassis. The steering box would need to be replaced and then re-welded back into place. This requires a number of skilled welders working over several shifts, and significant loss of production due to lengthy downtime.

### Finding a quicker solution for line boring

Based in Singleton and Gunnedah NSW, and providing onsite support in WA, Morgan Engineering are at the forefront of modern machining techniques. They employ the latest machining equipment to provide the very best all-round service to clients in mining and other industries.

As part of their commitment to innovation, Morgan Engineering's in-house team developed their own proprietary equipment and techniques to machine these steer box tapers in-situ – eliminating the entire removal and offsite repair process.

This process enables them to deliver exceptional quality solutions - exceeding OEM specifications, reducing costs, and significantly reducing downtime.

Mogan Engineering carry out this work onsite anywhere in Australia and can complete the repair in only 12-14 hours as opposed to three or four days. The cost of the repair is around 60 per cent less than a new replacement part. The flow-on cost reductions from minimising downtime are also significant.

### In-House Development – Third Party Certified

This unique, portable solution was developed in-house along with custom designed and engineered tooling. The complete

tooling assembly fits neatly into a single box that can be transported anywhere in the country and quickly deployed onsite.

The complete process has been third-party certified to ensure both component and machine integrity are maintained.

This extra level of quality assurance provides clients with the confidence their assets are repaired to within specification, with an exceptionally high standard of workmanship.

### Real World Application

The Maintenance Manager of a prominent gold mine in NSW faced a costly dilemma in relation to refurbishment of one of their CAT 789 haul trucks.

As part of the site's scheduled maintenance program, they identified significant wear in this particular truck's steer box.

A new steer box would have to be imported from the USA, which is not only expensive but meant a ten-week wait for the parts to arrive – and that's without considering the time required for the complex job of removing the old steer tapers and welding in the new ones.

This truck carries 200 tonnes of material per run, and completes approximately 12 runs per shift, with two shifts a day, seven days a week. Over an eight-week period,

that translates to over 268,000 tonnes of lost production.

However, they reached out to Morgan Engineering instead, and were presented with a unique solution. Morgan Engineering sent their specialised machining equipment and personnel to site and also brought one of their service exchange bell cranks with them. They were able to machine and repair the two steer box tapers in-situ, bringing them back to within OEM specifications.

Once complete, the mine's maintenance crew were able to carry on completing the truck's maintenance program, to get it back on the road. The company's maintenance manager was thrilled that the truck was returned to service only three days over the initial service interval, rather than the estimated ten weeks.

With the truck back in operation, it was set for another 10,000 hours of non-stop work, and the company did not lose over a quarter of a million tonnes of production.

This real-world example demonstrates just how cost-effective Morgan Engineering's innovative onsite tapered steer box machining system really is.

**Contact us today on (02) 6572 2032 or [morganengineering.com.au/contact/](http://morganengineering.com.au/contact/) to find out more.**

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# CORNERSTONE IN UNDERGROUND MINING COMMUNICATIONS

**F**or the past 15 years, ARE Services has been a cornerstone of Underground Mining Communications and Technologies throughout Australia and overseas. The company specialises in the design, supply, installation and maintenance of a range of radio and automation technologies for existing and new underground and surface operations.

ARE Services' new Comet Remote Telemetry System provides reliable, cost-effective SCADA for remote monitoring and control of underground and surface assets across any operations. The system seamlessly integrates to ARE Services' leaky feeder radio system to provide remote monitoring

of primary ventilation, secondary ventilation, stench gas, mine water, mine air and dewatering equipment.

The system is scalable to the mine's needs. The first stage of implementation is usually a portal indication display and radio warning system to provide real-time feedback to personnel in the mine regarding the status of the primary ventilation system.

Subsequent system expansion includes automation of the Stench Gas emergency warning system and a secondary ventilation network. Remote activation of the Stench Gas system will allow personnel to



be informed of an emergency, improving safety outcomes for the mine. Surface control of the secondary ventilation will reduce re-entry times and energy consumption.

The system can also be integrated into fibre optic or ethernet based networks and operate simultaneously with radio systems.

The Comet Telemetry System complements ARE Services' Australian designed and assembled underground leaky feeder products. ARE Services' Leaky Feeder system is compatible with the latest digital radio voice communications systems.

## First Mile

The First Mile product has been designed to provide cost effective and reliable high-speed ethernet to any part of the mining operations and can be utilised as a standalone system or integrated into the existing local area network as required.

The system has many advantages besides being cost effective as opposed to other last mile products, it is simple to install

and maintain, allowing onsite personnel to complete any repairs onsite without the requirement for specialist tooling or knowledge, keeping network downtime to a minimum.

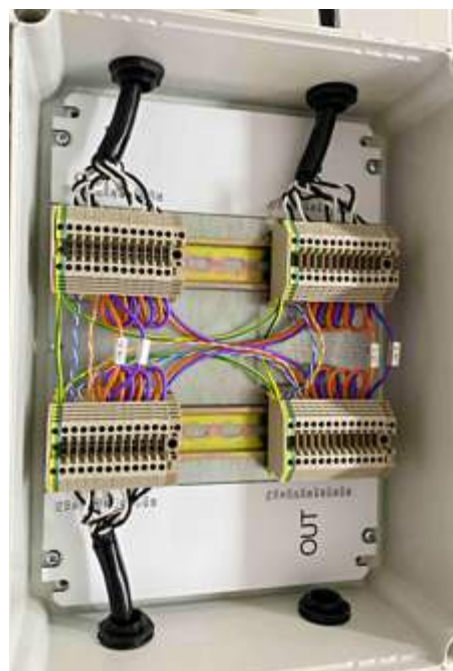
Another key advantage is that the system can either be powered locally at each end or energised via its own interconnecting cabling, eliminating expensive additional infrastructure requirements.

Once the First Mile System is deployed, it has the flexibility to be extended either as a point-to-point network or point to multi-point as required by the design, with the ability to connect to cameras, WLAN access points and other critical IT infrastructure.

**For further details please contact our sales team on 08 6460 8715, via email [sales@arewa.com.au](mailto:sales@arewa.com.au) or visit [www.arewa.com.au](http://www.arewa.com.au)**

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ARE Services is a West Australian-owned company specialising in the provision of the following products and services to the Mining Industry.

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# SMARTTECH AUSTRALIA

## CHANGES UNDERGROUND MINING WITH RAJANT UNDERGROUND

In recent years, the mining industry has witnessed a remarkable transformation, with the integration of cutting-edge technologies enhancing safety, efficiency and productivity. One company at the forefront of this innovation is SmartTech Australia, a leading technology solutions provider specialising in the mining and civil industries.

SmartTech stands proudly as a Rajant Premium Partner, offering invaluable support to companies seeking to transform their operations with the revolutionary Rajant Underground technology. This pioneering wireless communication solutions company has been at the forefront of driving remarkable progress in the mining sector, opening up new frontiers of innovation and efficiency.

Underground mining poses numerous challenges, from the harsh working environment to limited visibility, making communication and data transmission

a daunting task. Traditional wireless systems struggle to penetrate dense rock formations and are vulnerable to signal disruptions, hindering seamless connectivity between miners and central control centers, including remotely operated machinery.

Rajant Underground has brought its expertise in Kinetic Mesh® technology to the table. Unlike conventional Wi-Fi networks, Rajant's Kinetic Mesh® employs a unique decentralised approach, utilising interconnected nodes that adapt and dynamically self-organise to maintain an uninterrupted connection. This dynamic mesh network allows data to hop from node to node, ensuring that communication remains robust even in the most challenging subterranean conditions.

Recognising the potential of Rajant's technology, SmartTech Australia embarked on a collaborative journey to tailor these solutions to the specific needs of underground

mining. The result was a comprehensive communication and data management system that can help you redefine safety and efficiency in your mine.

With Rajant Underground's Kinetic Mesh® in place, SmartTech Australia has successfully enabled real-time communication between miners, supervisors and central command centers. Miners can now report potential hazards instantly, allowing swift responses to mitigate risks and prevent accidents.

Additionally, live data feeds provide real-time updates on ventilation, gas levels, and equipment performance, streamlining decision-making processes and maximising productivity. This enables mines to meet their statutory requirements from monitoring staff to danger alerts, all in real-time.

The integration of Rajant Underground technology has also facilitated seamless

asset tracking and fleet management. Each mining vehicle is equipped with wireless nodes, enabling their real-time location tracking and performance monitoring.

This data-driven approach optimises operational logistics, reduces downtime and promotes fuel efficiency, ultimately leading to cost savings and increased output.

SmartTech Australia's collaboration with Rajant Underground as a Premium Partner has brought forth a new era of innovation in underground mining. Through the deployment of Rajant's Kinetic Mesh® technology, the company has overcome longstanding communication and data management challenges, elevating safety, and efficiency in this critical industry.

As these transformative solutions continue to evolve, the mining sector can look forward to a safer, more productive future. **AMR**



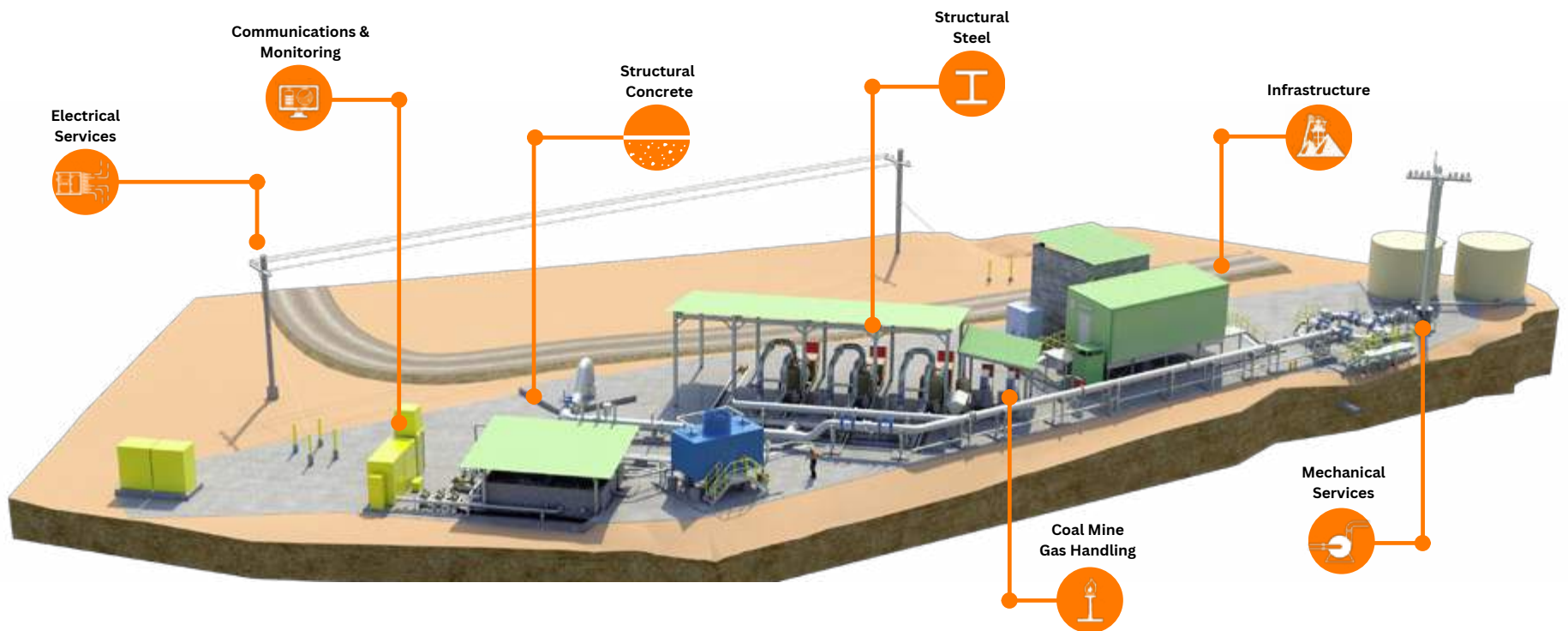
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## SUSTAINABLE DESIGNS

With sustainability in the forefront of our minds, Singleton Engineering Solutions (SES) has always been active in the areas of coal mine gas capture and management.

Singleton Engineering Solutions provides engineering, drafting and visualisation and project management services. These services cover mechanical, electrical, and civil engineering. Our core focus is the resources industry, specialising in underground and surface mine equipment and infrastructure. With sustainability at the forefront of every aspect of design, current and future underground mining operations require a balance of hands-on experience and innovative solutions to meet the challenges ahead.

### EXPERIENCE COUNTS

Our combination of engineering knowledge and operational experience allows us to meet clients' needs with economical solutions that are

compliant and practical for the intended operating environment. Several of our technical team have inter-industry experience with underground mining in both coal and hard rock operations, power generation, ports and infrastructure. Our focus on employing and mentoring the right people who are open to solving engineering challenges with practical and proven design, is key to the success of Singleton Engineering Solutions.

### INNOVATION THROUGH DESIGN

The nature of underground mining provides unique design and construction challenges rarely seen in other industries. Assisting our clients with projects in diverse environments

along with compliance to mine regulations and engineering standards, requires practical and innovative design which the team at Singleton Engineering Solutions deliver. Our team is regularly engaged by a wide range of clients from established multi-national resource companies to startups helping them transform ideas into engineered reality.

Changes to legislation including the recent amendment of Safeguard Mechanism will continue to challenge how we operate into the future. That's why we have established working relationships with methane gas drainage equipment suppliers, gas powered generators and ventilation air methane abatement technology providers. With the aim of providing solutions for our clients to integrate

these technologies into their existing operations.

### DEDICATED SUPPORT

At Singleton Engineering Solutions our focus is on supporting our clients through the complete lifecycle of their projects and operations. With the capability and experience to support all stages of the project pipeline from concept studies to implementation, including detailed design, procurement, contract management, on-site installation and commissioning support. Our support continues through the operational phase with management of sustaining capital projects, including relocation of surface infrastructure, methane gas drainage plants, reticulated services and major equipment overhaul management.

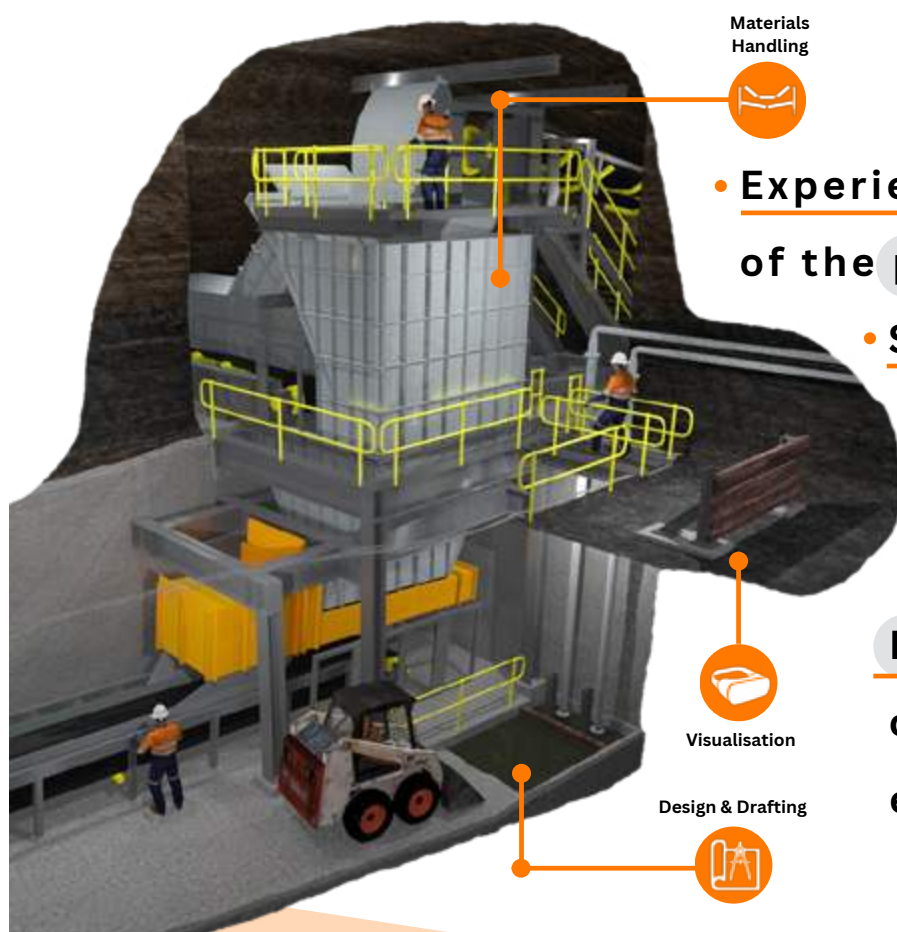
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**Singleton Engineering Solutions**



# FROM HUMBLE BEGINNINGS TO A TRUSTED PROVIDER IN CIVIL CONSTRUCTION

**F**amily owned and operated civil construction company HEH Civil specialises in the design, construction and rehabilitation of civil infrastructure for all Government levels and private clients.

With strong roots in Northern Australia's construction, earthmoving, agricultural and mining industries, we own and operate our own comprehensive fleet of equipment and are experiencing strong growth in Southeast Queensland.

Since inception, we have steadily grown to a team of over 100 and attribute this growth to putting emphasis on developing engineering and managerial expertise.

Our experience and capabilities span a wide range of civil contracting disciplines, and we believe that our success is strongly linked to our culture of open communication and collaboration.

With a strong practical background in heavy machinery and earthmoving, we have become a trusted provider in the civil construction industry throughout Queensland. Our ability to complete projects on time and in budget are a major drawcard for our clients.

Our speciality services include urban development, general civil construction, water and sewer infrastructure, bulk earthworks, bridge and drainage infrastructure,

slope stabilisation and main roads construction.

## Projects

The most recent projects we worked at saw us undertake dam construction, haul road construction and maintenance, camp construction, clearing and design.

We have widened Mount Nebo Road, installed a guardrail and removed several roadside hazards, and upgraded from single to double lanes at the Harley Street intersection.

Further, we installed pressurised pipelines for a more efficient water delivery system at the Sunwater Channel and cleared land

and carried out bulk earthworks, landscaping, road construction, sewerage and water reticulation, and environmental protection and maintenance works for the Cutter Rise 1B Residential Subdivision.

We even provided our services during the COVID-19 pandemic to construct a new pedestrian bridge over New Settlement Road in Narangba, in collaboration with Moreton Bay Regional Council.

In the future, we're aiming to take on any mining projects under a value of \$50m.

**For more projects please visit**  
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# HEH CIVIL



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# EARTHWORKS MADE EASY

**K**algoorlie-Boulder based service provider Ground Masters has been undertaking exploration, rehabilitation and civil works across since 2004. With a metro site in Bullsbrook, and a renowned reputation across south-east Western Australia, the company's service offering and machinery fleet has continued to evolve in line with industry demand.

From a range of excavators, loaders, trucks and compact equipment, through to graders, rollers and water trucks for servicing civil works, Ground Masters stop at nothing to ensure their clients receive the best equipment on every job.

Exploration works have long been an integral part of the company's core offering, where its loader, backhoe and excavator fleet have been recruited along with 8x8 trucks and 4x4 support vehicles to back them up when it comes to tough work.

Ground Masters recently added a Kenworth K200 and Brimarco widening drop-deck trailer to their fleet, which enables them to provide statewide transport solutions to their clients, and further afield into the east if required. Vehicles, machinery, structural components, buildings and over-dimensional requirements can be accommodated, as well as smaller load tilt tray trucks.

Additionally, a Hino road sweeper has been welcomed into the fold, which has filled a gap in the Goldfields region, where limited providers have the necessary equipment to perform sweeping applications. Maintenance of roadways, hardstands and airstrips can be undertaken efficiently, and during unscheduled times such as construction works and incident response. Complimenting the range are a pit vacuum and skid steer sweeper attachment for quick site clean-up needs.

When you choose Ground Masters, clients can be assured that all duties will be performed reliably and in accordance with safety, environmental and maintenance management frameworks.

Ground Masters' footprint expansion has seen it service Warburton and Jameson in the east, all the way to Esperance in the south, the Wheatbelt towards the southwest, the metro region and north to Gascoyne and Pilbara. Fleet and labour mobilisation can also be undertaken to meet the requirements of projects in other regions.

**For more information on how you can benefit from Ground Masters' expertise, call 08 9093 3555, email [enquiries@groundmasters.com.au](mailto:enquiries@groundmasters.com.au), or visit [www.groundmasters.com.au](http://www.groundmasters.com.au)**

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IN  
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- ✓ Camp logistics services
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- ✓ Sweeping of site roads, hardstands and airstrips



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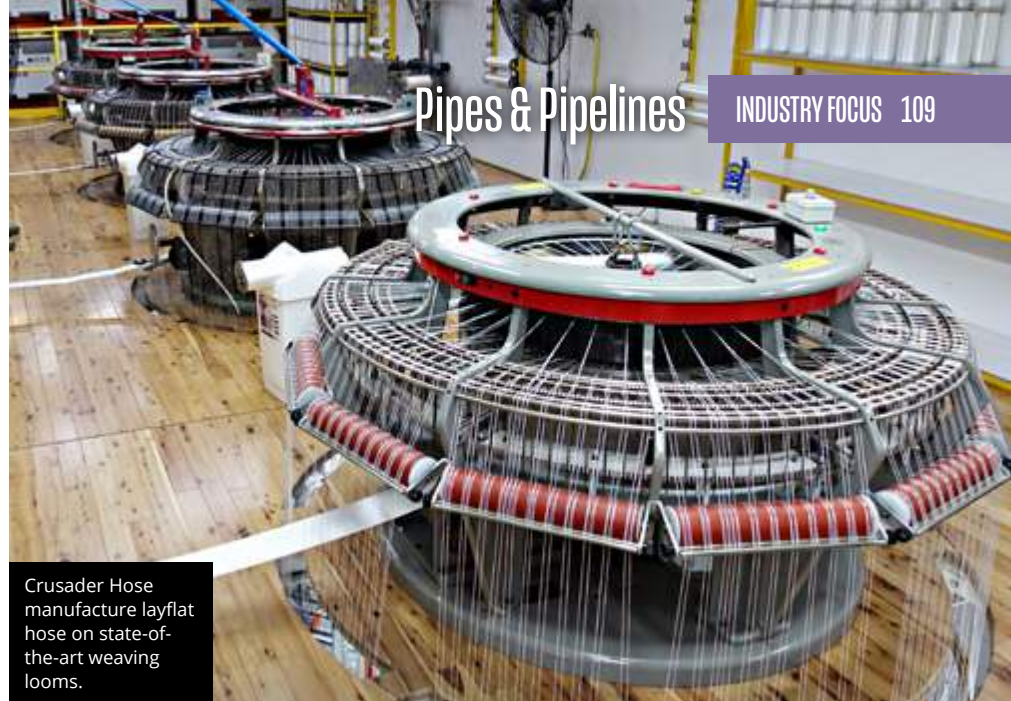
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A double clamp coupling to ensure easy & secure attachment to the pump & bore cap.



Crusader Hose manufacture layflat hose on state-of-the-art weaving looms.



Crusader Hose continue to research and develop strong layflat hose for ultra-deep bores.

# STAY FLEXIBLE & PROFITABLE

First manufactured to combat the corrosive effect of the high salinity in the Pilbara region, flexible, PU-coated riser mains are gaining popularity as their capabilities increase.

**C**rusader Hose first developed flexible rising mains in the late 1980s to offer an alternative to steel pipes when used with submersible pumps in areas of high salinity. Since then, Flexibore, their flagship product, has undergone many upgrades and has proven itself an influential player in the market in bore water pumping. Their current focus is making more significant inroads and achieving a broader acceptance for Flexibore in the mining sector.

Founded in 1987 as a fire hose company, Crusader Hose saw great potential in expanding its product line with the advancement in plastics extrusion. With a polyurethane lining and cover, the woven hose could withstand greater working pressures satisfying the requirement for pumping water in bores 100 m deep or more.

With patented and reliable clamps, the woven hose's high tensile strength and end-pull ratings would allow it to suspend the submersible pump deep inside the borehole without a safety cable. With its capabilities in line with steel pipes, Flexibore would then nullify all corrosion issues.

## The original problem

There are many bores in the Pilbara where the groundwater has high salinity. In the past, these bores were equipped with rising mains typically made from either steel or stainless steel. After some time, the high salinity caused enough corrosion to the riser that the pump would eventually have to be pulled out of the bore.

Some of the 6m sections of steel pipe would need to be replaced. This replacement proved expensive and arduous as the heavy pipe sections would need to be unthreaded using drill rigging-type equipment.

## The Flexibore solution

Due to the woven polyester textile reinforcement, the flexible layflat hose has high tensile and burst pressure capability. The high-tenacity yarns are interlocked on state-of-the-art European circular weaving looms, forming the layflat hose's core. It is important to discern the difference between woven layflat hose and braided layflat hose.

While they may look similar, braided hose does not have the working pressure of woven hose. Hose manufactured with a

woven textile reinforcement can only handle high-pressure and high-tensile loads. Francois Steverlynck, MD, at Crusader Hose explained, "The core of all our manufactured hose is similar to that of a fire hose".

## Aussie ingenuity

Welding a strip down alongside the entire length of Flexibore, with loops every metre, was a technical breakthrough at their Melbourne factory over 20 years ago. These loops at 1m intervals allow an anchoring point for the electrical power cable, which run alongside the hose to drive the submersible pump.

A double clamp coupling was also developed in Australia to make it easy and secure to attach the pump and bore cap to the Flexibore hose.

## Current state

Crusader Hose have continued to research and develop stronger layflat hose for ultra-deep bores.

"Having the factory in Australia allows us to improve the design, as we have all the equipment and a great engineering team," said Francois. Crusader Hose are the only

manufacturer in the world with a 6" flexible riser with a 900m burst pressure. As mines need to dewater from deeper within the pit, the submersible pumps must be set deeper, so a high pressure hose is essential.

## Alternatives

Unfortunately, it has been challenging for Crusader Hose to get acceptance from some mines in the Pilbara. "There is an alternative product from England, and its manufacturer somehow has managed to discredit our Australian-made capability," said Francois.

However, successful applications across the rest of the mining and farming sector have slowly enabled Crusader Hose to earn its rightful place as the riser of choice for Australian Mining.

## Rigid pipes

Whilst Stainless steel riser pipes are now rarely used, fibreglass riser pipes are still popular at some mines. "While it is not the focus of this article to discuss the merits of rigid v flexible, it is important to note that flexible layflat hose is readily available and is less than 50% of the cost," concluded Francois. **AMR**



# Stop the mess with the FlangeLock Tool



**T**he FlangeLock Tool is the ultimate contamination control tool for protecting any hydraulic system.

Produced in the United States, FlangeLock Tool is an easy-to-use cap that slides over the flange and is sealed by tightening the bottom plug by hand, keeping oil in and contaminants out.

CKC Equipment imports the FlangeLock Tool into Australia, which is then sold nation-wide through the company's extensive network of distributors.

The FlangeLock Tool was developed by Greg Molloy who realised there had to be a better way than using plastic bags and rags to prevent contamination and leaks.

With an easy on, easy off process, the FlangeLock Tool offers a leakproof solution to hydraulic system and environmental cleanliness that is guaranteed to stop the mess and reduce the need for expensive clean ups.

The reduction in oil leaking from hoses also drastically reduced the risks associated

with slip and fall hazards, representing a huge benefit to staff safety, as well as a decreased chance of environmental contamination.

The FlangeLock tool can be used across a breadth of industries including construction, mining, oil fields, dredging applications, wind turbines, and large machine tools.

Currently manufactured in lightweight aluminium, it is produced in twelve sizes for 8, 10, 12, 16, 20, 24, 32, 40, 48, 56 and 64 in SAE Code 61, 62 and CAT.

Other advantages of the FlangeLock Tool are that no tools or expensive hardware are required, while rags stuffed into hoses and messy plastic caps are a thing of the past.

Installation and use is quick and easy, requiring just one hand, with no additional equipment required.

To improve safety and reduce risk – get your FlangeLock Tools now, visit [ckcequipment.com.au/flangelock-distributor-list/](http://ckcequipment.com.au/flangelock-distributor-list/)

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**SAVE TIME**  
**SAVE MONEY**  
**IMPROVE SAFETY**  
**REDUCE CONTAMINATION**



**A leakproof solution to hydraulic system and environmental cleanliness.**

The FlangeLock Tool allows for the simple sealing of open SAE Code 61, 62 & 62 CAT-Style hydraulic flanges without tools. Constructed out of lightweight high tensile strength T2200 anodized aluminium. Easy on, easy off.



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# EMBRACE TOTAL CONTROL WITH PROTOBLAST

Since 1975, Protoblast has led the way when it comes to engineered abrasive blasting systems for all industries. Today, the Australian owned and operated company is still run by the same family, now in its third generation, with all equipment designed and manufactured in Picton, NSW.

With over 45 years of experience, we have found time and again that the cost of logistics from outsourcing the abrasive blasting process is very often hidden and overlooked and has shown that it is, more often than not, approximately equal to the invoice value of the blasting. This has driven Protoblast to help local manufacturers become more efficient and self-sufficient by providing high quality locally made and serviced abrasive blasting equipment.

## The Power of Total Ownership and Support

Working directly with the manufacturer gives you unmatched precision, ensuring uniform surface preparation and consistent results with every project. This level of control allows you to elevate your standards and deliver excellence in every detail. Protoblast take pride in offering complete ownership and ongoing support throughout your journey with them. From the initial consultation to installation and beyond, their dedicated team will be by your side, ensuring your success at every step.

## Expert Guidance and Customisation at Your Fingertips

Protoblast recognises that every business is unique, with specific requirements and challenges. That's why they give you direct access to their experienced engineers and professionals. These experts possess in-depth knowledge of abrasive blasting processes and will guide you through the selection, customisation and implementation of Protoblast equipment to suit your precise needs. With their expertise at your disposal, achieving optimal results has never been more accessible.

## A Commitment to Excellence

Protoblast has garnered a reputation for excellence, and their commitment to customer satisfaction is unwavering. Their team of experts is not only passionate

about delivering top-of-the-line equipment but also dedicated to supporting your business throughout its journey to success. They understand that your triumphs are their triumphs, and that's why they go above and beyond to ensure your experience with Protoblast is nothing short of exceptional.

One of our valued clients, MMC, who experienced a game-changing transformation with our abrasive blasting equipment gave this testimonial.

"Choosing Protoblast for our abrasive blasting equipment was one of the best decisions we made, thanks to a strong recommendation from others. Although we were blasting prior to the install, it was without abrasive recovery or recycling. The garnet recovery system introduced by Protoblast has revolutionised our workflow, resulting in massive cost savings and increased efficiency compared to a non-recyclable system. The equipment's waste reduction through recycling has far exceeded our expectations, and even though the quality of our work remained consistent, the reduction in cost and effort has been remarkable. We wholeheartedly recommend Protoblast's abrasive blasting equipment to others in our industry due to their outstanding service, competitive pricing, honesty, and being an Australian-based company that goes the extra mile to cater to our specific needs, including supporting us from afar during commissioning. In our experience throughout the project, we found Protoblast to be refreshingly straightforward and dependable, delivering on their promises without any unnecessary fluff and continuing to offer valuable advice even beyond their initial supply, making us feel truly valued as customers."

At Protoblast, they believe in empowering businesses to achieve greatness. Their abrasive blasting equipment isn't just machinery – it's a catalyst for transformation. Whether you're seeking efficiency gains, enhanced quality, or a competitive edge, Protoblast has the solution.

**Embrace the power of total control with Protoblast!**  
[www.protoblast.com.au](http://www.protoblast.com.au)

AMR





# A leading Australian manufacturer of ABRASIVE BLAST EQUIPMENT



ProtoBlast has been designing and manufacturing to suit customers' individual needs since 1975.

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**AIRLESS BLAST MACHINES**

**SECTION BLAST MACHINES**

**DUST COLLECTORS**

The best way to prepare a surface for a coating is by using the abrasive blasting process. Whether you need to blast earthmoving equipment, turbines, structural steel or railway lines...

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# THE GOLD STANDARD IN ABRASIVE BLASTING AND PROTECTIVE COATINGS



**T**he nature of the mining environment demands quality and precision when it comes to abrasive blasting and protective coatings.

These specialty fields are serious business and demand a reliable partner with the proven experience and commitment to delivering the highest standards.

Queensland's premier blasting and protective coatings service provider, Rocklea Abrasive Blasting (RAB), has been helping commercial clients restore and protect their assets for over 25 years.

The company offers a suite of solutions that go beyond conventional abrasive blasting and protective coatings.

RAB can handle a diverse range of surfaces and substrates with a level of precision that gives mining compa-

nies the confidence they need when it comes to their critical components and infrastructure.

With expertise that covers surface preparation, corrosion control, coatings application, and ongoing maintenance, RAB's holistic approach to industrial operations serves to optimise the performance and longevity of an asset.

"Our state-of-the-art facilities and cutting-edge technology enable us to take on projects of any scale and complexity," said RAB director Greg Allison.

"We have laser cleaning technology for all motors and moving parts, abrasive media solutions, wash bay facilities, plus seven spray booths, and our team of skilled technicians are well versed in navigating the unique challenges faced by the mining industry."

A relentless focus on safety and an innate awareness of the environment form the bedrock of RAB's operations.

The team not only complies with all safety regulations and industry best practices to mitigate risk, but they embrace eco-friendly techniques and materials to minimise their environmental impact across all facets of their business.

Aluminum oxide used in the blast process is cleared of nuisance dust and recycled with waster, bagged and tagged, and then responsibly disposed of. All gun wash thinners are also recycled onsite to ensure as little waste as possible.

Mr Allison says that beyond providing top-tier services, RAB values lasting partnerships with its clients.

"Over the past 40 years working in the

manufacturing field, 23 of those have been with Drake Trailers," he said.

"I still use many of the same suppliers, and service the same clients since the 70's and 80's. Some are now grandchildren of original owners, which reflects the continued strength and importance we place on service and relationships."

RAB currently services some of Australia's leading miners and associated service providers including Bosch Rexroth, Haulmark Trailers, Hastings Deering, Komatsu, Drake Trailers, Hitachi Mining Assembly and FWR Australia.

**For more information, visit**  
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# 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.

**S**teuler'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 rubbing 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**

# THE **ULTIMATE** IN CORROSION PROTECTION

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[www.steuler-kch.com.au](http://www.steuler-kch.com.au)

**STEULER** | Linings



# SOLUTIONS FOR MINING EQUIPMENT

**K**eeping mining and heavy construction equipment in top operating condition is a constant challenge for today's mining and construction contractors.

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.

That is where CLIMAX can help.

CLIMAX has the on-site repair and maintenance machines that will minimise maintenance times and keep mining and construction equipment working for companies and their customers.

Thousands of worldwide mining and construction companies rely on CLIMAX to keep their fleets of tractors, loaders, excavators, draglines, cranes, and other heavy-duty equipment out-in-the field maximizing their profits.

Mining operations are almost inevitably remote, gruelling, complicated, and cramped.

Competition is fierce and profit margins are thin, while downtime can be devastating. In this kind of environment, it is easy to

see why portable machine tools in general and CLIMAX in particular, were discovered by the mining industry long ago.

Companies that serve today's mining industry face formidable challenges.

These include difficulties inherent to the business itself, as well as those caused by a still-uncertain economy.

Mining repair projects, especially those underground, must be undertaken in close, cramped quarters that make an already arduous task even more demanding.

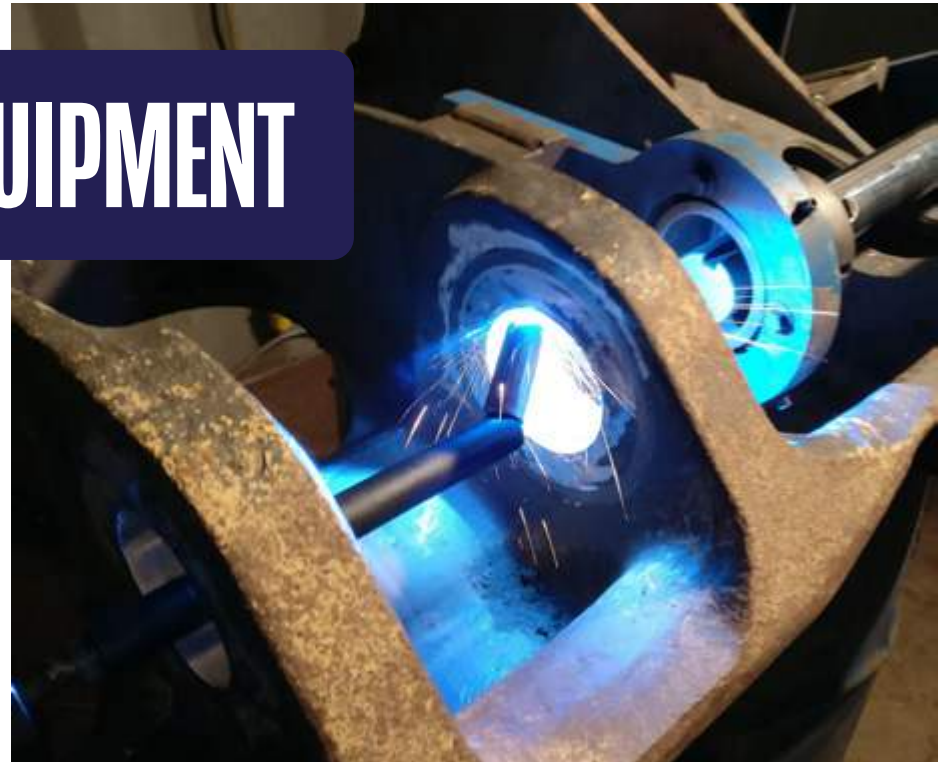
For contractors, even winning a job is a tough task; competition is fierce, customer loyalties tenuous, and concerns with bottom line issues intense.

One of the biggest challenges faced by customers in their work for the mining industry is expediting the rigorous process of underground repairs.

Adjustability and equipment versatility are critical to enable workers to perform a variety of repairs efficiently and effectively in extremely close quarters.

Finding a tool that can meet these demands is a top priority for mining and construction contractors.

The CLIMAX BB5000 is a compact, flexible



line boring machine that installs in 30 minutes.

The line of automated on-site welders interface with the boring bar system, enabling one set-up for both items, to help decrease weld time and improve productivity.

The system's adaptability to bore and welding simultaneously makes it useful for repairs on mining and heavy construction equipment.

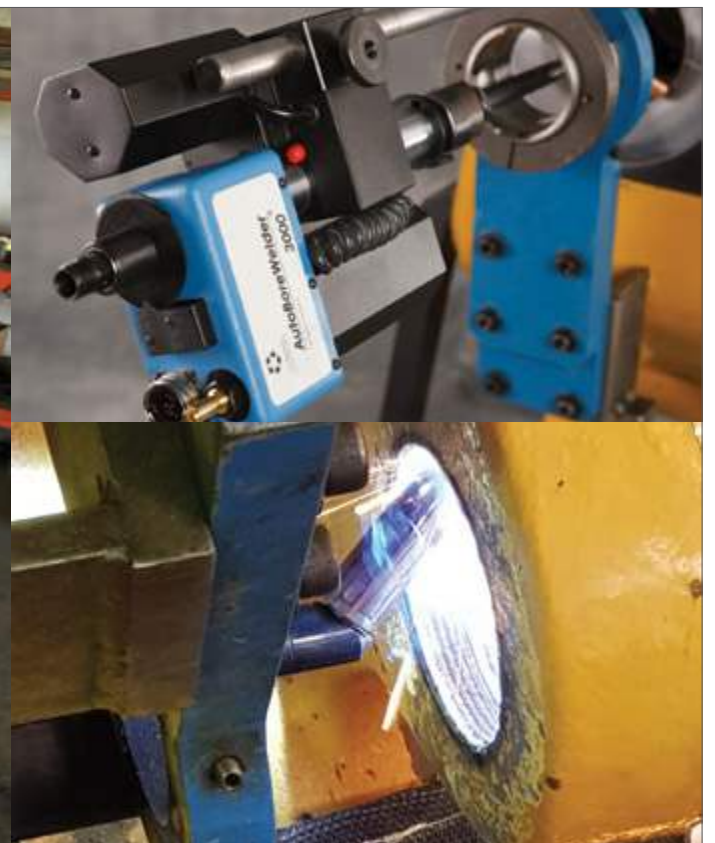
Customers trust CLIMAX for mission-critical machining, welding, or valve testing projects, in a wide variety of industries including oil and gas, mining and heavy construction, power generation, ship

building and repair, aerospace and defence, and many others.

With CLIMAX sites and factory-certified representatives covering the globe, its team is committed to delivering an outrageously good customer experience – every interaction, every time, everywhere – 24/7.

Go to [www.climaxportable.com](http://www.climaxportable.com) for more information on products. Contact Field Machine on **1300 368 368** for applications, engineering, custom design, training, start-up and commissioning, after-sale service, spare parts, equipment repair and maintenance, and rentals.

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Since 2015, we have been delivering superior quality welded structures and mechanical construction services to the oil and gas industry across Australia and the Pacific Islands.

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Our specialisation includes fabrication

and installation of above ground, below ground and subsea pipelines, as well as fuel tank modification, refurbishment, floor replacement, and structural works, as well as new tank builds using the jacking construction method.

Our comprehensive workplace health and safety system is certified to comply with ISO45001, and all site personnel have completed their General Construction Safety Training or equivalent.

We have a team of highly experienced riggers, boiler makers, sheet metal fabricators and ticketed welders available to deploy to jobs on an as-needed basis.

Our company director Harry Nemaia per-

sonally oversees each program of work and is onsite during every phase of the project — from design, construction and commission.

This ensures consistent quality is maintained throughout and projects are delivered on time, to scope, in a safe way and within budget.

Complying with customer specifications, relevant statutory and regulatory requirements ensures that we achieve and can maintain certification to ISO 9001:2015 quality management systems.

We have previously worked with construction engineering company Monadelphous at the Phosphate Hill project where we undertook a full roof replacement, full

replacement of annular plates and four straight plates replacement.

We also constructed two new 21m diameter by 12m high, four million litre acid tanks for BHP South Australia, for Monadelphous.

Most recently, we constructed a new concrete ring beam foundation and new tank floor to API653 compliance at Quantem Terminal Brisbane, and emergency fuel line repairs at Pacific Energy -Southwest Pacific in Fiji. **AMR**

**For more information, or to discuss you welding and fabrication needs contact 0411 057 043, email [info@pacificwelding.com.au](mailto:info@pacificwelding.com.au) or visit [www.pacificwelding.com.au](http://www.pacificwelding.com.au)**



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# 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.

## Engine oil filtration

Increased demands to extend oil change-out intervals on engines has resulted in the use of synthetic oils being used on modern engines. These synthetic oils have resulted in oil change-out intervals being significantly increased, thereby reducing costs associated with oil changes. Extended oil change-out intervals have also impacted the filter used on the engine. Change-out of the filter element is in most cases associated with a change-out of the oil and the filter element has therefore had to be adapted to meet this requirement.

Filter elements have also had to adapt to other aspects of modern engines.

- Improving fuel economy
- Improving power
- Reducing emissions

Clean oil improves fuel economy and power output by reducing friction and wear on moving parts of the engine. Increased wear causes oil to enter the combustion chamber, burns with the fuel and is exhausted into atmosphere as particles and hydrocarbons.

## Full flow and by-pass filters

Filters usually installed and supplied with the engine are referred to as full flow filters.

The total flow rate of the lubrication pump is directed through this filter to lubricate the engine. By-pass filters are an addition to the full flow filter. A flow of oil is directed from the main oil supply into this filter to enhance filtration capability. Filter media used in by-pass filters is specifically designed to capture small particles which the full flow filter cannot.

## Soot

Soot and sludges in engine oil are formed as a by-product of incomplete combustion. When the air and fuel mixture fails to ignite completely, there is leftover particles. These particles find ways into the lubricating oil and is reflected as soot. It is very rare that the engine combusts completely, so most engines will produce soot.

Extended oil change-out intervals increase the risk of high soot build ups in the engine oil. Full flow filters installed on engine have limited ability to remove this soot as particles are too small for the filter to remove. By-pass filter however have the ability to remove this soot and sludges in oil.

## Oil change out intervals

Oil change-out intervals are almost always dictated by the engine manufacturer.

These intervals are based on distance or operational hours of the engine. There is an increasing trend to further extend these intervals.

Testing of oil samples has shown that this can happen after the recommended interval has elapsed.

## Triple R by-pass filters

Triple R filter elements have unique features which make the element suitable for by-pass filters used on engine. No other filter element on market displays these unique features.

1. Engine 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 larger 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.

A variety of housings makes the Triple R filter solution suitable for any size engine.

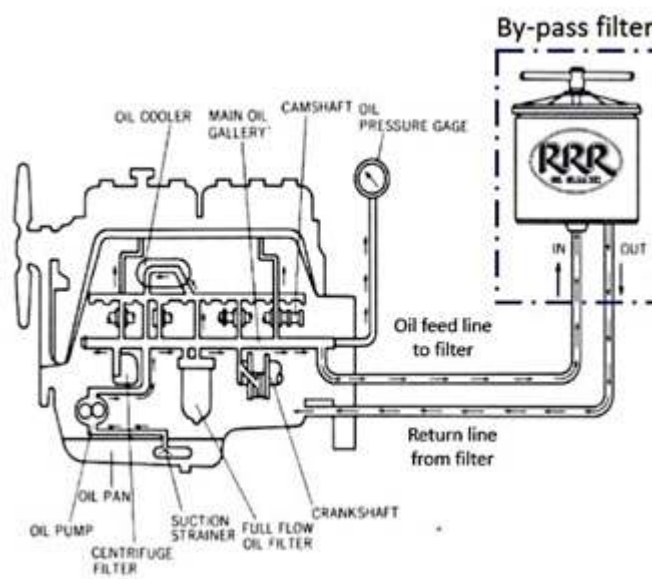


In the 3rd stage of filtration, the filter media is compressed at maximum by means of the outer wrap, which traps all small particles in the oil.

The filter element has a very large volume of cellulose filter media contained within. This volume or area of media ensures that the element is effective at removing contamination as well as ensuring extended lifetime of the element. A selection of housings makes the Triple R filter solution suitable for any size engine.

Selection of the type of filter housing is carried out quite simply by the sump size of the engine. Housings are typically available in aluminium, steel and stainless steel and range from single element housings to multiple element housings.

Housings are supplied with integrated valves needed for functioning of the filter as a by-pass filter fitted onto the engine. This makes installation hassle free with no other control valves to be installed. **AMR**



Contact us to find out more  
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## THE NEXT GENERATION IN OIL FILTRATION

We specialise in providing solutions to improve oil cleanliness and condition by utilising Triple R depth elements.

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**The 3 stages of filtration** in the element ensures that the oil remains free of water, varnish, sludges and particles.

## Applications include:

- Hydraulic systems
- Lubrication oil systems for
  - › Compressors
  - › Gearboxes
- Diesel and gas driven engines
- Metal working fluids
- Heat transfer fluids

## Our solutions for your industry:

- Tailored oil impurity control advisory
- Depth cleaning filters
- Custom engineered systems
- Oil cleaning services: Varnish, Water Removal
- Real time oil sample analysis
- Filter systems mobile & stationary
- Rental/Hire fleet





Walkers Hammers' service technician advising operational and maintenance features of the Rammer 5011E with their customer, Indigenous Civil Group (ICG).

**O**ne of the major causes of premature failure in rockbreakers is long cycles where an operator continues to hit the button and keep the piston striking for extended periods of time.

Correct operation, regular maintenance and visual inspections are vital in minimising the chance of rockbreaker failure, which leads to costly unscheduled downtime.

Following simple guidelines and operational techniques when using a rockbreaker can minimise component wear and deterioration, keeping operators breaking rock for longer.

Fortunately, Rammer has readily accessible resources available, including short YouTube videos, product training and manuals, that guide operators through the process of keeping their rockbreaker in prime working condition. These are supported by a dedicated global dealer network for all Rammer parts and products.

Maintaining your rockbreaker isn't difficult if you follow some simple operational tips, from idle strokes and tool angles, to correct greasing and maintenance practices.

#### Less idle strokes

Frequent idle strokes can have a deteriorating effect on a rockbreaker. Rammer rockbreakers are equipped with ideal blow protection as standard to prevent idle strokes. It's recommended that idle blow protection is switched on during normal operation as the rockbreaker can only be initiated once the tool is pressed against an object.

Operators can turn it off when breaking

soft material or in demolition applications where it is difficult to apply sufficient feeding force.

#### Optimal tool angles

It is advised to keep the rockbreaking tool at a 90 degree angle with the surface of the material to be split or broken. If the object moves, or its surface breaks, angle should be corrected immediately.

Continued use above or below a 90 degree

angle can damage the rockbreaker and wear out bushings faster.

Striking material near an edge of a surface rather than in the centre can also increase rockbreaking efficiency for operators. Avoid striking in the same spot for more than 15 seconds at a time. If the object does not break, or the tool does not penetrate, stop the rockbreaker and change the position of the tool.

Every 10 hours or at least once a week, it is recommended the rockbreaker tool retaining pin and the tool are removed for a condition inspection, and any burs ground if necessary.

#### Visual inspections & greasing practices

Preventing unnecessary downtime through proper rockbreaker maintenance and service schedules is critical in mining applications. Rammer is committed to helping operators work safer and more productively, whilst keeping their rockbreakers in optimal condition.

Greasing, particularly keeping the tool shank well-greased during operation, is a highly recommended maintenance strategy. The right amount of grease depends on rockbreaker size, application, working



# HAMMER LONGER WITH Rammer®

## UNRIVALLED PERFORMANCE

For over 40 years, Rammer rockbreakers have proven the reliable solution for the toughest mining, quarrying and demolition applications. The company knows that getting the most out of your rockbreakers comes down to more than just the right product. It requires an in-depth knowledge of the science behind the product, its materials and components, which all combine to maximise service life.

Featuring advanced hydraulics, quality materials, and excellent power-to-weight ratio, Rammer rockbreakers have gained a reputation for safety and reliability, particularly in hard and abrasive Australian environments.

Their flagship rockbreakers and hydraulic booms are purpose-built to work safely and efficiently. From major excavation and clearing works, to the effortless breaking of hard rock, concrete, reinforced structures, asphalt surfaces, or even frozen ground, Rammer rockbreakers are designed for power and productivity in the most challenging conditions.

cycles, wear rate of the tool shank and bushings, condition of the tool seal, and quality of the grease used.

The rockbreaker tool should be checked every two hours to ensure it is sufficiently greased, including the automatic grease cartridge. Operators should monitor hydraulic oil temperature, and ensure all lines and connections are secure.

The mounting hardware on the rockbreaker and carrier should be checked and tightened if required.

Every 50 hours or at least once a month, the tool shank and bushings should be inspected for wear. If the grease grooves on the tool bushing are worn, the bushing must be replaced.

Hydraulic hoses should be regularly checked and replaced if necessary, and

that the rockbreaker moves normally inside the housing, and vibration dampening elements such as pads and buffers are in good condition. The condition of wear pads and internal housing wear also require inspection. It is also advised that operators avoid using a rockbreaker with the tool submerged underwater unless previously setup for such an application.

Regular visual inspections of the rockbreaker and its components are essential.

### Short & long-term storage

To protect the rockbreaker when not in use, the tool should be removed and the rockbreaker itself stored in a vertical position. The lower end of the piston tool and tool bushings can be protected with grease.

Connections should be sealed with clean plugs to prevent oil leakage and dirt from

getting into the couplings. It is also important that the rockbreaker is appropriately secured to prevent it from falling.

### Preventative maintenance

The integration of Rammer's world-first RD3 hydraulic rockbreaker monitoring technology is an effective method for operators to remotely monitor rockbreaker usage and prevent premature failure. It provides operators with detailed information in real-time via the cloud based SAM platform, allowing them to manage service periods and minimise machinery downtime by scheduling maintenance during times that have minimal impact on production.

Product Line Lifecycle Manager for Rammer Rockbreakers, Esa Sjöberg says it's no surprise that their large rockbreaker range is a reliable choice for miners due to the robust components and high-quality

steel used, which offer extra durability throughout the breaker lifecycle.

"Despite our innovative manufacturing processes and high-quality materials, maximising rockbreaking effectiveness relies on correct working methods and maintenance that not only improve productivity, but help operators increase their equipment service life. That's why our team is dedicated to educating operators on how to achieve the most from their rockbreakers." **AMR**

**For more information, or to locate your nearest dealer, visit [www.rammer.com](http://www.rammer.com)**

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Factory fitted remote monitoring hardware, RD3 as standard

## SMART ROCKBREAKER TECHNOLOGY

### Advantages of innovative technology:

- real-time data on operation
- reduced breaking times
- lower cost per tonne of material broken
- protection against premature failure
- longer tool life
- simplified maintenance
- reduced downtime



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Cast iron impellers are susceptible to damage from corrosive liquids in mining.

# AUSSIE REDUCES CORROSION DAMAGE

**H**andling highly corrosive acid liquids on mine sites is not confined to gold, zinc, copper or nickel processing. Even coal mines, both underground and open cut, often have the same problems.

Whether the application is dewatering, or a more complex leachate treatment involving filtrate systems, cast iron and even low grade stainless steel pumps will be subject to severe corrosion.

Aussie Pumps has confronted this issue by developing a range of 316 cast stainless steel self priming pumps, in diesel engine or electric motor drive configurations.

## CORROSION TOO COMMON

Since introducing the range, Aussie Pumps has seen a ready acceptance of the Aussie

GMP "X" stainless steel pumps for mining applications. In highly corrosive locations, 316 stainless components with Viton seals and elastomers are extremely durable.

**Aussie Pump first started marketing a range of heavy duty cast iron semi trash pumps into the construction and mining sectors.**

"We found that although the pumps were suitable, from the point of view of performance, corrosion was far too common," said Aussie Pumps Chief Engineer John Hales. "Impellers were damaged and service life was limited to around six months."

Aussie solved that problem by introducing 316 stainless steel impellers into cast iron bodies. However, eventually the integrated volute in the pump body started to be eaten away, with consequent losses of performance and efficiency.

That drove the company to invest heavily in stainless steel bodies, paired with stainless steel impellers to make the machines as durable as possible.

There was a major increase in materials cost, but by increasing production volumes and economies of scale, prices were kept reasonable.

## STAINLESS STEEL MINE PUMPS

The result was a range of highly competitive first world pumps, from 2" all the way to big 4" semi trash style machines suitable for mining applications.

**Aussie was able to offer both high volume and high head versions. These robust pumps self-prime easily, based on the "big shoulder" integrated tank design.**

With 316 stainless steel components and Viton seals, the pumps were very reliable moving corrosive water. The 2" version, in its high flow configuration, delivers flows up to 440 litres per minute and has a top operating head of 20m.

All pumps self prime through a vertical lift of 6m. The 2" and 3" ranges are available in either single or three phase heavy duty TEFC electric motors with an IP rating of 54.

The 3" series, B3XRA-X is available in 4 and 5.5 kW configurations, producing flows up to 1400 lpm and heads as high as 28m. The 4" high volume pump was designed specifically for high volume water transfer. It is a 15 kW configuration that delivers 2100 lpm at a total of 31m head.

## BIG OPEN IMPELLERS

Aussie Pump engineers soon realised that it wasn't just high volume pumps that were required for corrosive liquids. Many mines needed higher pressures but still the same simplicity of a self priming centrifugal design. The requirement for higher head pumps, some with heads as high as 70m, became obvious.

**"Mine engineers love the big open impellers on the high volume pumps," said Hales. "The 316 stainless steel versions were quickly adopted and became very popular."**

Aussie Pump engineers, working with a leading European pump engineering company, came up with a range of high pressure motor pumps that deliver heads as high as 70m and flows up to 2250 lpm. That equates to an impressive 135 cubic metres per hour.

## HIGH PRESSURE RANGE

The pumps needed open impellers to pass small solids, but at the same time possess high pressure capability. Aussie achieved this by using a high pressure, open impeller.

The high pressure range in stainless steel, now includes a 2" pump with heads as high as 32m (50 psi) and 3" pumps in the G3TMK-A/X line-up with a horsepower range of 5, 7.5 and 11 kW.

Those big 3" pumps quickly became popular because of their combination of high pressure and flow. For example, the 11 kW version will deliver 1,100 lpm and has



Impellers corroded and worn from pumping abrasive and aggressive liquids.



a maximum head of 55m. The pumps are self priming, for easier operation.

### DIESEL DRIVE

Not every corrosive liquid application on a mine site has access to electric power.

Aussie Pumps started making diesel drive machines, beginning with 2" series using Yanmar L48 4.8hp electric start diesel engines.

Those early models, produced around 12 years ago, developed into a "Mine Boss" configuration, built tough for mine site conditions.

The Mine Boss has a 32mm stainless steel tube frame with integrated lifting bar, and stainless steel base with anti-vibration mounts. Other features include E-stop and battery isolation, a lockable battery case, and fire extinguisher.

**Those pumps are working hard every day in the mines, and some have been in use for almost ten years without even replacing mechanical seals.**

Aussie Pumps started making bigger diesel drive machines, using Kohler KD625 air cooled diesels to run the big 4" model B4XR-A/X stainless steel pumps. These large pumps are very popular on many sites where big flows up to 2100 lpm are required, and deliver a maximum head of 31m.

### HYDRAULIC DRIVE

The 316 stainless steel, high volume, high pressure pumps in electric motor and diesel engine drive proved very popular. The next step was to go hydraulic.

This looks very promising for applications where corrosive liquids are required. One obvious area of requirements is drilling equipment. Most drill rigs use slurry pumps but liquids can be highly contaminated, creating real problems with the pumps.

**Improved service life of the pump equipment justifies the additional cost of 316 stainless steel.**

The pump range, now converted to stainless, includes the 2" 440 lpm B2KQA series, the B3XRA 3" high volume pump, and the G3TMK-A series, high pressure version.

The big B4XRA-X high volume, high pressure stainless steel pump is also now available in hydraulic drive.

### ALWAYS INNOVATING

Stainless steel pumps are expensive! To keep prices down, Aussie improves manufacture and production at scale, to keep the unit cost of these pumps low.

In the meantime, Aussie has already developed stainless steel impellers for our big 6" model B6XR-A cast iron pump. If the demand is there, we will develop a cast 316 stainless steel version of that big high volume trash pump.

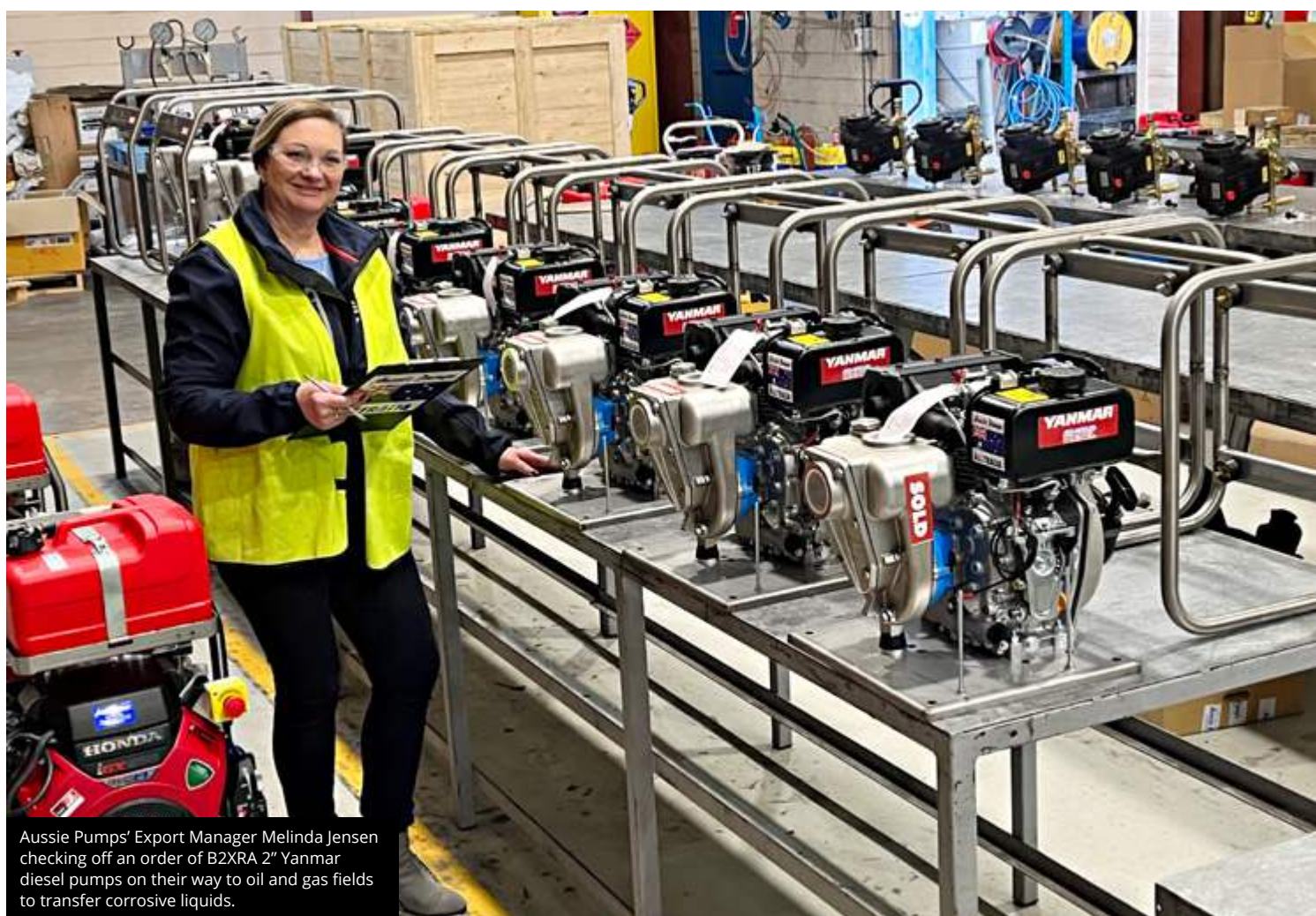
**The Aussie GMP range in stainless steel, is coming into its own to complement the existing high penetration that Aussie Pumps has in the mining industry, in Australia, and globally.**

For more information on stainless steel mine pumps, visit [www.aussiepumps.com.au](http://www.aussiepumps.com.au)

AMR



Diesel drive stainless steel 4" pump for abrasive applications.



Aussie Pumps' Export Manager Melinda Jensen checking off an order of B2XRA 2" Yanmar diesel pumps on their way to oil and gas fields to transfer corrosive liquids.





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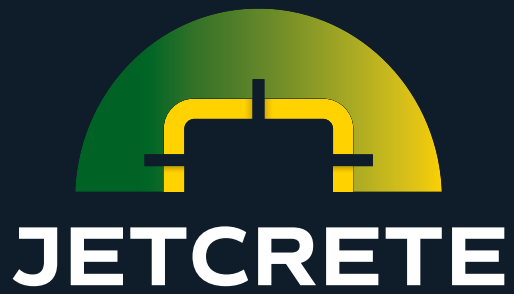
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