

THE AUSTRALIAN MINING REVIEW

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EVOLUTION

GOING FOR GOLD WITH MUNGARI EXPANSION

Evolving from a small company into a globally relevant gold mining business, Evolution Mining has extended the mine life of its Mungari operation to 2038.

This decision was made following the Mungari Future Growth feasibility study which was completed in December 2022.

The *Australian Mining Review* speaks with Evolution Mining managing director and chief executive Lawrie Conway on the expansion work and what it means for the company's future.

CONTINUED ON **PAGE 30**



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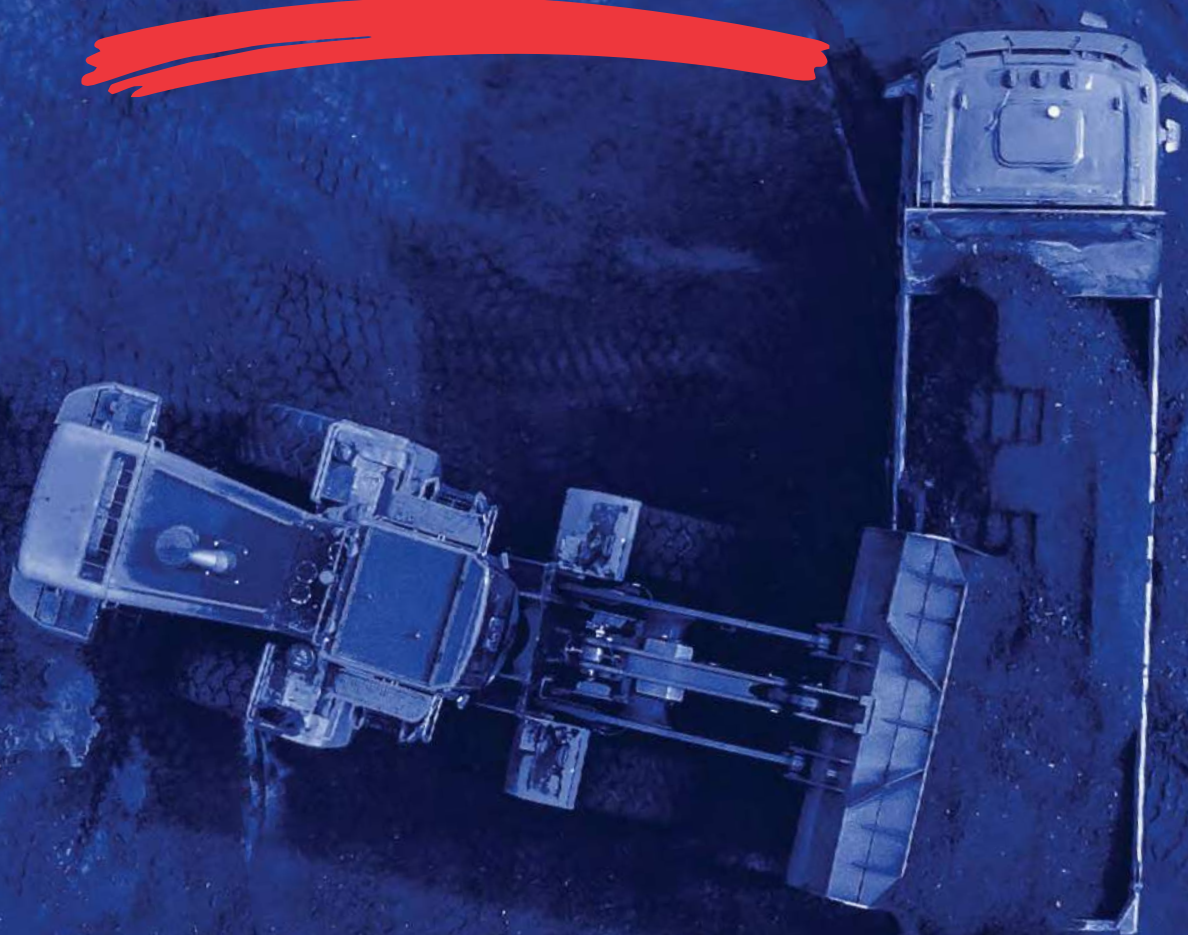
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03

NEWS

News	03
Explorers On The Move	14
Mining Lifestyle	16
Get Into Mining	18



44

INDUSTRY FOCUS

Companies Gearing Up	44
Water In Mining	65
Manufacturing & Fabrication Solutions	69
Cyber Security	76
Mine Shutdown Services	80
Conveyors & Belting Solutions	84
Domes & Shelters	85
Engineering Services	86
Cables & High Voltage Solutions	90
Lighting Solutions	92
Lock Out Tag Out	95
Rail In Mining	96
Courses & Careers	98
Fleet Management	100
Accommodation, Catering & Facilities Management	104



20

FEATURES

Drilling In Mining	20
Workplace Health & Safety	29
Evolution Mining Mungari Expansion	30
Glencore Mount Isa Mines	32
Talison Lithium Greenbushes Mine	33
Mining Emergency Response Competition	36
Fenix Resources Iron Ridge	40
Super Pit	42



106

TECHNICAL TALK

Water in Mining - Pipe Freezers	106
Pump Solutions	108



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HANCOCK PROSPECTING

BECOMES LIONTOWN'S LARGEST SHAREHOLDER, ALBEMARLE WITHDRAWS APPLICATION

Hancock Prospecting is now the largest shareholder in Liontown Resources (ASX:LTR), after acquiring 19.9% of Liontown shares.

In early September 2023, Hancock made an initial 7.72% investment and then increased it to 10.7% later in the month.

Hancock then further increased its holding in Liontown to 16.7% in early October.

In all instances, the strategic stake was acquired for no more than \$3 per share.

Hancock's shareholding gives Liontown the opportunity to leverage Hancock's ex-

pertise to support the development and operations of its Kathleen Valley lithium project in WA.

Located on the western edge of the Norseman-Wiluna Greenstone Belt, Kathleen Valley is a Tier One battery metals asset with a mineral resource estimate of 156mt at 1.4% lithium oxide and 130ppm tantalum pentoxide.

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

First production at Kathleen Valley is targeted for mid-2024.

The remaining shares were expected to be acquired by Albemarle Corporation, however, the company withdrew its indicative proposal due to "growing complexities associated with executing the transaction".

Liontown managing director and chief executive Tony Ottaviano said the company accepts Albemarle's decision.

"They [Albemarle] were constructive and respectful throughout the diligence process," he said.

"Notwithstanding, our position to maintain momentum on our base plan has allowed us to keep line of sight of first production from the Kathleen Valley project in mid-2024."

Liontown is committed to delivering on its strategic plan and is confident in its ability to thrive independently.

The company's board and leadership team maintain a focus on delivering Kathleen Valley into production. **AMR**

BHP MILESTONE: SHIPPED 3BT IRON ORE TO CHINA

BHP (ASX:BHP) has celebrated the shipment of 3bt of high-quality iron ore to China.

To mark this milestone, key customer representatives were given a tour of BHP's Pilbara and Port Hedland operations.

A gala event was also held in Perth.

On the tour, BHP chief commercial officer Vandita Pant and BHP asset president of WA iron ore Brandon Craig were joined by China Iron and Steel Association (CISA) vice chairman Luo Tiejun and key customer representatives at the Mining Area C and South Flank mines as well as the Port Hedland export facility.

Mr Craig says this is a significant milestone for the company.

"This is a significant milestone for BHP's iron ore business and for WA, and we are delighted to commemorate the achievement, celebrate our partnerships and showcase our world-class WA operations," he said.



(Image source: Thomas Graham) (From L-R) CISA vice chairman Luo Tiejun, BHP chief commercial officer Vandita Pant and WAIO asset president Brandon Craig in Port Hedland, WA.

"We are fully focused on continuing to produce and deliver our high-quality iron ore resources safely, reliably and sustainably."

The gala was attended by WA Premier Roger Cook, Federal Resources Minister Madeleine King and representatives of the Consul-General of the People's Republic of China in WA.

Ms Pant says BHP is looking forward to building on its partnerships.

"BHP's relationships with our customers in China have been fundamentally important to our company over the past 50 years," she said.

"Through the reliable delivery of our high-quality iron ore resources and significant investment in steelmaking capability, together we have grown trade and provided the materials necessary for economic development globally.

"We look forward to building on our

strong partnerships through collaboration to innovative and advance technologies with the potential to help decarbonise the steelmaking industry."

Following the first shipment in 1973, it took BHP nearly 30 years to deliver its first 100mt of iron ore.

By 2014, it had shipped 1bt and, following significant investment and growth in its WA iron ore business, has now delivered 3bt just nine years later. **AMR**

Bellevue Gold managing director and chief executive Darren Stralow presenting at the WA Mining Club's September luncheon.

GREEN GOLD

Bellevue Gold (ASX: BGL) managing director and chief executive Darren Stralow presented at the WA Mining Club's September luncheon on the company's world-leading aspiration to achieve Net Zero emissions (Scope 1 and Scope 2) by 2026 for its Bellevue Gold project in the Goldfields, WA.

In what Mr Stralow calls "friendly competition for Net Zero mining", by comparison Fortescue Metals Group (ASX: FMG) has a target of 2030 while IGO (ASX: IGO) is aiming for 2035.

The Bellevue gold project will be in production in a few weeks and the company is forecast to be a top 20 Australian gold producer with significant scale, grade and margin, along with Tier One ESG credentials.

Bellevue Gold is working on carbon miti-

gation using the "hierarchy of controls", typically used in safety, through the acronym "AERO" - Avoid, Eliminate, Reduce and Offset.

Mr Stralow says the Avoid part was focused on during the study phases of the project.

"There were three feasibility studies done on Bellevue and, each time, the renewable energy penetration was increased through those phases," he said.

"We are forecast to be the lowest carbon intensity mine per ounce across the Australian landscape.

"On the Eliminate front, Bellevue Gold is building a world-leading power station with its partner Zenith Energy, targeting 80% renewable energy penetration averaged across the year.

"It'll be up to 90% in summer - we're designing it for 'engines off', so when the sun is shining and the winds are blowing, we will be able to power our mine purely off renewable energy."

Mr Stralow says the company is doing a lot of work now on the Reduce front of "AERO" through the installation of ventilation on demand.

"We're one of the first underground mines to put a system called Delta Vent, which is variable speed drives for surface and underground fans," he said.

Two of Bellevue Gold's major contracts on site are underground mining through Develop and power through Zenith.

"Develop and Zenith have created joint ventures with Tjiwarl Aboriginal Corporation and, through these, both companies have come up with initiatives to help decarbonise the Bellevue mine," Mr Stralow said.

"That is a good way to get into our hearts as a supplier - to team up with Tjiwarl and create something that not only has an economic benefit but has an ESG benefit as well."

The last big piece on the Reduce front is diesel equipment.

Bellevue Gold has partnered with the Electric Mine Consortium (EMC) to increase electrification in mining.

"It's solving the issue or the problem of how to electrify those heavy pieces equipment that are really going to take us on that path, not just to from Net Zero but to real zero as a mining industry," Mr Stralow said.

Bellevue Gold is reducing emissions as far as technologically and economically possible as part of Offset, the final part of "AERO".

"There will be some hard-to-abate emissions that will need to be offset," Mr Stralow said.

"What we're looking for is local partners that create a benefit for the local communities - we're in a few discussions on that at the moment."

Bellevue Gold is working with ABC Refinery to create a differentiated product that has supply chain verification and with Tier One ESG credentials and Net Zero attached to it.

Mr Stralow concedes that there is no market currently for green gold.

"When you think about the total gold market and you compare it to what we're going to be producing at Bellevue over a year, it's 0.17% of the global gold market," he said.

"Not all gold needs to be green but Bellevue Gold is looking for the opportunity to essentially supply to what could be an interesting niche market.

"And we're asking the question - are 0.17% of customers willing to factor in the ESG credentials into high end items like jewellery, electronics, investments, bullion, coins?

"We hope the answer is yes."

Mr Stralow says being a first mover with this ESG strategy has helped with the company's attraction and retention of staff in a world where Gen Z has grown up with climate change and is leaning towards working with renewable energy and critical minerals.

"We've hired over 100 people in the last 12 months and, when you walk around site and talk to people, they say one of the reasons they joined Bellevue is that they really like gold mining, they like the quality of the mine but they also really like the ESG focus that we have," he said.

"When we drive up to site and do town halls and talk to the workforce - a lot of the questions we get are about the green gold, when we are doing it and what's the progress on it.

"There are also groups of investors that are very focused on it and they want to see us do it."

Mr Stralow says pushing ahead with green gold protects the company from "future rises in the price of diesel, the future rises in the price of gas, and any future potential carbon taxes that the government will inevitably put on". **AMR**

KOMATSU GD955-7 GRADER MAKES AUSTRALIAN DEBUT

The Komatsu GD955-7 grader has made its Australian debut in Mackay, Queensland, as it prepares to travel around the country to give mining customers their first look.

The GD955-7 loader is built specifically for mining operations with a big focus on productivity thanks to its blade up design allowing for more efficient ground penetration.

Komatsu national mining product manager Michael Hall says the loader has been highly anticipated by customers.

"The GD955-7 is a ground-up designed mining grader," he said.

"It can grade 33% more area per hour than the previous model, with a standard 5.5m

blade, or an optional 6.1m blade width for even more productivity.

"It also has the highest blade downforce in class and the highest engine power in class.

"It's a durable machine designed for high-power grading."

The GD955 grader comes with a 360-degree camera system, KomVision - which houses a five-camera system to provide a view around the vehicle using the KomVision monitor - and an additional rear mirror for reversing and ripping operation.

Mr Hall gave more insight into KomVision.

"KomVision increases visibility for opera-



(Image source: Komatsu) The Komatsu GD955-7 grader.

tors so they can get a full view of activity around the grader," he said.

"The monitor informs them if another machine is approaching or in their line of movement, a great safety feature for busy mine sites.

"The GD955-7 is also 50% heavier than the previous model, meaning it can more easily grade hard-packed road surfaces and take on more demanding jobs." **AMR**

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RIO TINTO

COMMITTS FURTHER \$1.7M TO AUSTRALIA-JAPAN INNOVATION FUND

Rio Tinto (ASX:RIO) has committed an additional \$1.7m to the Australia-Japan Innovation Fund (AJIF) to promote research and academic projects between the two countries and further collaboration between industry, educational institutions and governments.

The commitment was signed at the 60th Australia-Japan Annual Joint Business Conference which was held in Melbourne from October 8 – 10.

Rio has been the sole funder of the initia-

tive since it was established in 2018 and has funded about \$5m in operating costs and research grants since then.

Rio Tinto chief executive Australia Kellie Parker says the company is pleased to make another commitment.

"Science and technology are paramount in tackling today's global challenges," she said.

"We are pleased to make a second commitment to the AJIF to support research

projects that can help tackle these challenges and build relationships between Australia and Japan."

The AJIF will use this new funding to allocate grants to research areas with close links between Australia and Japan such as green steel, automated infrastructure and renewable energy systems.

The grants will also play a key role in supporting research between the two countries in science and technology areas rel-

evant to the resources industry to help generate the innovations the world needs to decarbonise.

AJIF chairman Murray McLean commented on the funding.

"We welcome Rio Tinto's sustained commitment to supporting collaborative cutting-edge research project involving Australian and Japanese partners, thereby realising some of the vast potential for such research between the two countries," he said. **AMR**



Person holding gold bars.

We Vote YES:

NEWMONT-NEWCREST SHAREHOLDERS

Newmont Corporation shareholders have voted overwhelmingly in favour of the proposed Newcrest Mining Limited (ASX: NCM) acquisition, with a total of 96% saying yes to what the company calls a "transformational transaction".

Newcrest shareholders also voted in favour of the takeover, with both companies anticipating the transaction closing in early November.

Newmont president and chief executive Tom Palmer commented on the outcome.

"Recognising the strategic rationale to create the industry's strongest portfolio of world class gold and copper assets, Newmont's shareholders overwhelmingly

voted in favour of this transformational transaction," he said.

"This unrivalled platform, featuring the industry's best talent running the highest concentration of Tier One assets in the most favourable jurisdictions, uniquely positions Newmont to generate superior returns for decades."

On September 18, Newmont announced it had received clearance from Australia's Foreign Investment Review Board (FIRB) and Japan's Fair Trade Commission for its acquisition of Newcrest.

Prior to that in August, the Australian Competition and Consumer Commission (ACCC) cleared the proposed acquisition

and conveyed its recommendation to the FIRB.

Clearances were also received from the Korea Fair Trade Commission, the PNG Competition Clearance, the Canadian Competition Bureau and the Philippine Competition Commission (PCC).

Mr Palmer is pleased Australia and Japan have given the green light to proceed.

"Following a thorough review by regulators, we are pleased that the transaction has been given the green light to proceed in Australia and Japan," he said.

"In addition to further strengthening Newmont's operational footprint, our entry into the Australian investment market will

allow us to attract shareholders from Australia and the Asia Pacific region, positioning Australia as a key centre of gravity for Newmont's global business."

In mid-May 2023, Newmont announced its definitive agreement to acquire Newcrest.

Once completed, the acquisition will create a world-class portfolio of assets with the highest concentration of Tier One operations, primarily in favourable, low-risk mining jurisdictions.

Upon closing of the transaction, the combined company will deliver a multi-decade production profile from 10 large, long-life, low cost operations and increased annual copper production primarily from Australia and Canada. **AMR**

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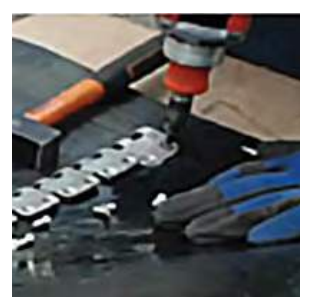


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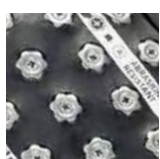


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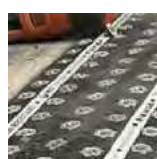
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AUSTRALIA'S MINING SECTOR ON SHOW

AT WA MINING CONFERENCE & EXHIBITION

Decarbonisation, sustainability and technology in Australia's mining industry were the key talking points at the two-day WA Mining Conference & Exhibition (WAMCE), held at the Perth Convention and Exhibition Centre on October 11 and 12.

More than 110 exhibitors were on display, showcasing the latest and greatest in technical and digital innovation in mining and resources.

DAY 1

Future of WA Mining

Chamber of Minerals and Energy WA chief executive Rebecca Tomkinson delved into the future of Australia's mining sector, with a particular focus on WA.

"WA is not just a minerals powerhouse in Australia but also worldwide," she said.

"According to WA's mineral and petroleum Statistics Digest, the State's resources sector delivered record sales of \$231b in FY21/22 — when COVID had its biggest impact across the State.

"This year's WA State Budget highlighted the mining and resources sector accounting for almost one-third of all State Government revenue.

"The sector's contribution in royalties alone was around \$12.7b."

Forecasts from the Federal chief economist Michelle Dowdell highlighted that demand for world nickel consumption would rise 21% between 2022-2025, while lithium demand was expected to rise 66% between 2022-2025.

Despite WA's Goldfields being a powerhouse in the supply of lithium, cobalt, copper, rare earths and critical minerals, demand is quickly outstripping supply - the resources cannot be extracted quickly enough to meet global demand.

To keep up with this demand, Australia's largest open pit gold mine - the Kalgoorlie Super Pit - is undergoing a \$1.5b expansion of the operations mill — further proof that the precious metal is still going strong after 100 years.

Typically known for its gold production, the City of Kalgoorlie-Boulder is poised to become the epicentre of Australia's rare earth supply chain.

This will allow the area to keep up with change and adaptability, as well as tap into the resource potential.

Meeting this demand is giving Australia a "once in a lifetime" opportunity for economic growth, says Ms Tomkinson.

Coupled with Australia's rigorous environmental governance, the country is set to become a leading component to spearhead the global push to reach net zero.

Sustainable Mining Future

The year 2030 is the year set for reducing global greenhouse gas emissions by 43%, halting and reversing forest loss and land degradation, protecting 30% of the world's oceans and achieving targets set under the United Nations' 17 Sustainable Development Goals.

Over the past 10 years there has been the creation of the United Nations Sustainable Development Goals, the 2030 Agenda for Sustainable Development, the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework and the 30x30 Ocean Campaign.

Deloitte sustainability and climate change partner Celia Hayes says that in order to bring a more sustainable mining industry to life, relationships with natural resources must be redefined and the industry must take action in seven critical areas of the next seven years.

"By integrating circular economy principles, mining companies will stay relevant in an evolving economy that values natural resources at a premium," she said.

"The mining sector must also become a leader in understanding the economic value of nature, including effectively evaluating the biosphere and geosphere for the tenement."

Other steps include investing in sustainable water management, focusing on climate adaption, engaging with communities, communicating authentically and investing in future leaders.

DAY 2

Outlook for Australia's Mining Industry

Day two began with Minerals Council of Australia executive director of WA David Parker on the future of Australian mining.

Since gold was first discovered in the country in the 1800s, mining has helped grow the Australian economy to where it is today.

With the industry expansion in the 1970s and 80s, new towns, ports and rail developments started popping up in the remote northwest

of WA and opened it up to new global trading partners.

Countries such as the US, South Africa, the Soviet Union, Brazil, Chile and China dominated the mining industry from the late 50s to mid-70s - Australia only played a key role in bauxite and gold production then.

Today in 2023, Australia is the world's largest exporter of metals and minerals with bulk commodities such as iron ore, coal and natural gas becoming the economic backbone of the country.

Mining has consistently been one of Australia's two most productive sectors, with resources representing nearly 15% of the economy.

The growing scarcity of natural resources, increasing environmental degradation, technological advancements and the demand to reach net zero is changing the mining industry and how it operates.

Global challenges facing mining include resource nationalism, ESG integration, minerals demand, declining resources, digital technologies and long regulatory approvals but, despite this, Australia's mining industry is well placed to meet these challenges because of its commitment to improve and adapt.

Enhancing Cybersecurity in Mining Operations

When mining first began in Australia, technology played no role in operations, however in today's operations, it plays a major role in keeping operations safe from cyber attacks.

St Barbara head of IT Sameera Bandara says it's ok to accept cybersecurity risk in some instances, but an educated decision must be made as to whether the level of risk is acceptable.

"First, understand what the risk is and start with a risk assessment before moving on to a risk mitigation plan and risk remediation," he said.

"Other steps include vulnerability management, employee awareness, technology refresh and have an incident response plan."

In other industries, cybersecurity typically protects personally identifiable information and keeping intellectual property safe is priority.

In the mining industry, cybersecurity is essential in protecting personnel and ensuring production is a priority.

The future of cybersecurity in mining involves increased regulation, a higher priority to data integrity and a shift from information technology to operational technology. *AMR*



CRITICAL MINERALS FOCUS OF LATEST TASMANIAN EXPLORATION GRANTS

The Tasmanian Government has opened its latest round of mineral exploration grants, focusing on critical minerals.

Tasmanian Resources Minister Felix Ellis says applications for Round 9 of the Exploration Drilling Grant Initiative (EDGI) coincides with a global shift to find the minerals needed for renewable energy industries.

"We know that there is a global shift to find the minerals needed to build economies based on more renewables and Tasmania can be a leader in this space," he said.

"This funding will allow explorers to test greenfield locations and exploration leads to more resource projects and more jobs in the future for Tasmanians, especially in regional communities.

"Now in its sixth year, the grants program supports industry and investors to find new and potentially lucrative mining opportunities as well as the re-examination of old mines.

"The [Tasmanian] Government will provide up to \$70,000 for direct drilling costs and \$20,000 for helicopter support, if required, for successful applicants."

Minister Ellis says the program has helped mineral exploration in Tasmania reach its highest levels on record.

"More than \$43m was spent on mineral exploration in Tasmania in the past 12 months and the Exploration Drilling Grant Initiative is helping continue this exploration boom," he said.

To the end of August 2023, the program has supported 16.1km of drilling, with an estimated total industry expenditure (including costs such as logging and assaying) of just over \$5.3m.

"As our number one export earner, the mineral resources sector contributes more than \$2.8b a year in exports and supports more than 5800 jobs.

"The [Tasmanian] Government is delivering our long-term plan to grow our economy and jobs and will continue to support Tasmania's world-class mineral resources sector for the royalties it generates which is turn supports many of our essential services like health, education, police and emergency services and public housing," Minister Ellis said. **AMR**

LATROBE VALLEY COAL MINE REHABILITATION

The Victorian Government is ensuring the Latrobe Valley's old coal mines are transformed into safe and stable sites once they retire.

Victorian Energy and Resources Minister Lily D'Ambrosio and Victorian Water Minister Harriet Shing released the first amendment to the Latrobe Valley Regional Rehabilitation Strategy on October 13 to better reflect the context for coal mine rehabilitation, build on water access guidance and provide more certainty on the rehabilitation approval pathway.

Minister D'Ambrosio says the transition to renewables brings many opportunities for the Latrobe Valley.

"[This includes] transforming the coal-fired power stations and mine sites for new uses," she said.

"These changes will better protect com-

munity interests, ensuring the mines can progress rehabilitation planning and delivery to get the best outcomes possible for the Gippsland region."

Minister Shing says the community will have a say on shaping the future of Latrobe Valley as planning for mine rehabilitation continues.

"The new conditions ensure water entitlements of existing water users are not impacted and build on our recent agreement allocate 16GL per year to environmental, Traditional Owner and agricultural outcomes by 2024," she said.

With the Yallourn power station closing in 2028 and Loy Yang A in 2035, two Structured Transition Agreements allows both mine operators to apply for surface water access at the same time, meaning the impacts of the projects can be reviewed together.

Previously, mine licensees could only apply for water access within five years of their confirmed closure.

These new conditions ensure that water access for mine rehabilitation will not diminish the water entitlements of existing water users and values in Gippsland and will mitigate the future impacts of a drying climate. **AMR**



The Loy Yang brown coal power station at night, located in Victoria.

NOV2023 **AMR**



A joint taskforce has found an alarming number of vehicles carrying explosives across Queensland have defects, putting road users at risk.

Resources Safety and Health Queensland (RSHQ) and Transport and Main Roads (TMR) teamed up in September for Operation Cyclone.

Operation Cyclone ran across six different locations including Dingo, Stanwell, Nebo, Moranbah, Woodstock and Bajool.

Inspectors stopped 35 light and heavy vehicles carrying explosives, with 30% of those vehicles having defects.

RSHQ and TMR inspectors issued 13 compliance notices as a result.

CRACKING DOWN ON UNSAFE TRANSPORTATION OF EXPLOSIVES

RSHQ's deputy chief of explosives Snezana Bajic says it is disappointing to see so many vehicles failing the checks. "These vehicles are capable of carrying a very large quantity of explosives and if transported incorrectly the outcomes can be deadly," she said.

"It's the responsibility of the both the driver and consignor to ensure their vehicles are compliant.

"Compliance with safety regulations is paramount to the well-being of industry operators, other road users and emergency response services."

The results of Operation Cyclone will help improve safety across the resources sector.

RSHQ continues to support industry to transport dangerous goods, like explosives, safely. **AMR**



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(Image source: WesTrac) WesTrac Technology Experience Centre, Remote Operator Station.

Caterpillar dealer WesTrac has launched a new technology experience centre in Tomago, NSW, to showcase the latest in equipment, technology and innovation.

The new state-of-the-art centre provides customers with hands-on experience to demonstrate the advantages of using the latest Cat products and technology in the mining and construction industries.

The centre features a dedicated remote operator station where visitors can remotely operate a Cat 320 Next Generation hydraulic excavator, located in the on-site WesTrac dig pit.

This operator station can also be configured for the remote operation of other Cat machines, from mini excavators

and skid steer loaders to large equipment such as dozers and drills.

The technology experience centre also includes the latest in 3D printing solutions and live demonstrations of cutting-edge technology including the Cat MineStar technology.

This technology suite includes solutions for precision machine control and guidance, automation, remote operation, fleet health optimisation and fatigue monitoring.

Cat MineStar Command, which is available for both construction and mining applications, enables remote-controlled operations through to full automation, providing customers with multiple operational benefits.

WesTrac and Caterpillar have successfully developed MineStar Command in partnership with Thiess, which saw a world first for Caterpillar with the successful remote operation of three drill rigs by a single operator.

The team have also deployed MineStar Command line of sight and non-line of sight dozer solutions across multiple mine sites in NSW.

The technology experience centre demonstrates how WesTrac and Caterpillar's technology can be incorporated into a variety of operations, increasing site safety, productivity, efficiency and sustainability.

WesTrac chief executive NSW and Australia Capital Territory Adrian Howard says the technology experience centre

reinforces WesTrac's commitment to helping mining and heavy construction customers implement better technology into their fleets.

"The centre will greatly benefit our customers by delivering a practical and educational experience with the cutting-edge technology used by WesTrac and our Cat products," he said.

The centre is supported by the WesTrac training institute that offers accredited and post-trade training to both customers and team members, including operator training for the effective operation of Cat equipment using the latest technology systems. **AMR**

LITHIUM-SULPHUR BATTERIES: SUSTAINABLE OPTION WITH LOWER COSTS, IMPROVED RECYCLING

Monash University researchers have developed a new lithium-sulphur battery design with a nanoporous polymer-coated lithium foil anode that reduces the amount of lithium required in a single battery.

PhD student Declan McNamara, Professor Matthew Hill, and Professor Mainak Majumder of Monash Engineering, with Dr Makhdokht Shaibani of RMIT University, outlined in their recent paper, "A Nanoporous Permeable Polymer Coating for Practical Low N/P Ratio Lithium Metal Batteries", how applying the nanoporous polymer directly onto the lithium foil anode created a new battery design that used less lithium, had more energy per unit volume, lasted longer and would be half the price of lithium-ion batteries.

Lithium-sulphur (Li-S) batteries are an emerging energy storage technology that utilise metallic lithium and sulphur to deliver more energy per gram than lithium ion batteries. While Li-S batteries are highly efficient, the process of finding, extract-

ing and transporting lithium leaves a significant environmental footprint.

Li-S batteries also have their limitations.

Typically they contain a lithium anode (negative electrode) and sulphur cathode (positive electrode) with a separating layer.

When the battery charges and discharges, large amounts of lithium and sulphur are reacted with one another, placing the lithium metal under a lot of strain.

PhD student and lead researcher Declan McNamara of Monash Engineering says the thin polymer coating on lithium significantly improves the number of times the battery can be cycled.

"The polymer contains tiny holes less than a nanometre in size – one billionth of a metre – which allow lithium ions to move freely while blocking other chemicals that would attack the lithium," he said.

"The coating also acts as a scaffold for

lithium, and helps it charge and discharge repeatedly.

"Metallic lithium is a bit of a double-edged sword.

"Lithium is packed full of energy, but in a bad battery, this energy is wasted on side reactions.

"On the other hand, if the energy is channelled correctly, it can make some incredible energy storage devices that are easier to make.

"This coating is a step towards highly efficient, easily manufactured Li-S batteries."

The new design does not require nickel or cobalt, removing the need for minerals that have a significant environmental and social cost.

Professor Majumder says these developments are promising steps towards more widespread adoption of Li-S batteries and other lithium metal-based energy storage systems.

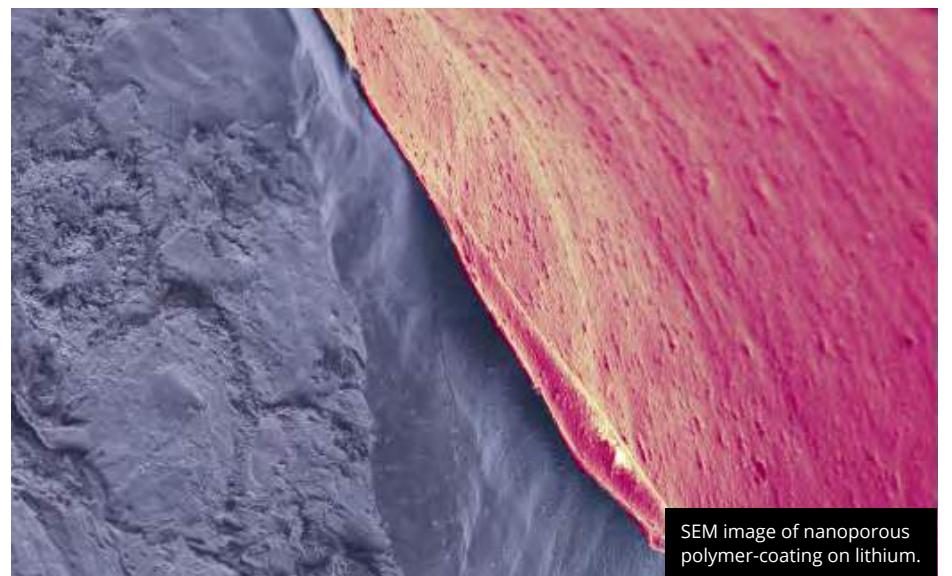
"Li-metal protection technologies will become crucial in our quest towards energy dense and sustainable batteries of the future," he said.

"The study establishes a new framework to protect Li-metal from rapid decay or catastrophic failure which has been an achilles heel for Li-S batteries."

Professor Hill says the technology can make an immediate impact.

"The market for electric vehicles, drones and electronic devices is on a steep growth pattern and this research is commercially ready for manufacturing to support that growth," he said.

"Producing more economical and environmentally sensitive battery options in Australia would be a great use of this technology, and we look forward to working with commercial partners to develop and manufacture this technology." **AMR**



SEM image of nanoporous polymer-coating on lithium.

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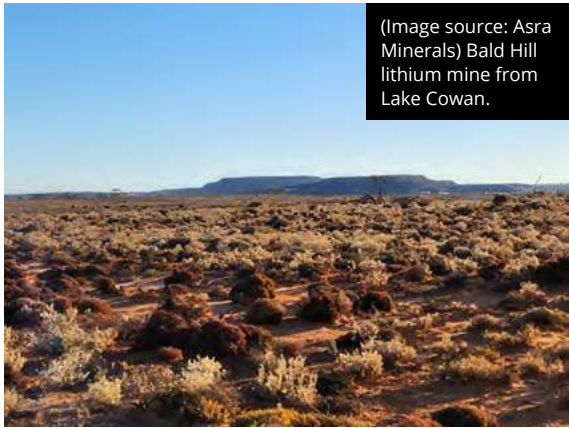
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ASRA MINERALS EYES GOLDFIELDS EXPANSION



Aerial view of the Goldfields region in WA.



(Image source: Asra Minerals) Bald Hill lithium mine from Lake Cowan.

Asra Minerals (ASX:ASR) has entered an exclusive option agreement to acquire two lithium exploration projects in the Goldfields region of WA.

Once completed, Asra would own 70% of the Lake Cowan project and 100% of the Lake Johnston project — both of which are situated in the highly prospective Yilgarn Craton area.

The acquisitions will increase Asra's

tenement package in the Goldfields to 1134km², creating a new southern hub of projects to complement the company's northern hub near Leonora.

Asra has begun planning for exploration at both lithium projects ahead of drilling, field mapping, outcrop sampling and soil, airborne magnetic and ground electro-magnetic surveys.

Managing director Rob Longley said the

acquisition will accompany Asra's existing projects.

"For the past year, Asra has been reviewing numerous critical minerals projects for exploration potential and these two outstanding lithium properties in the southern Yilgarn region show significant potential," he said.

"This unique geological region has gained prominence as a globally renowned lithi-

um hub, hosting numerous world-class lithium deposits and we're excited to be a part of it.

"This acquisition will complement our rare earth, critical minerals and gold projects at Leonora, reinforcing our position as an upcoming provider of high-demand minerals for the rapidly growing renewables market." **AMR**

High-grade assays and large widths show Bencubbin emergency as a potential significant rare earths discovery, with grades of up to 7,243ppm TREO from latest drilling within intercepts up to 79m wide.



BENCUBBIN, WA, EMERGING AS POTENTIAL SIGNIFICANT RARE EARTHS DISCOVERY

scale of REE enrichment across a major granitic body.

Other results include 79m @ 1,576ppm TREO from 32m including 8m @ 7,243ppm TREO, with positive project-wide auger results indicating strike potential of 22km.

Cygnus Metals managing director David Southern says these latest results at Bencubbin are highly promising.

"It is still early days in the discovery but we can see the project has significant potential and that's why we are about to start metallurgical tests," he said.

"While our clear focus remains on lithium in James Bay, Quebec, we are going to pursue Bencubbin with the aim of establishing its true full value.

"Our small dedicated Australian team will now focus on some follow-up air core drilling while samples are being sent for very important metallurgical test work."

Metallurgy is planned to be completed through ANSTO Minerals, the Australian Nuclear Science and Technology Organisation. **AMR**

Cygnus Metals (ASX: CY5) has found high-grade assays in an area that majors including Rio Tinto (ASX: RIO) and IGO (ASX: IGO) are actively exploring for rare earth elements (REE).

These are some of the thickest and highest-grade intersections to date at

the Bencubbin rare earths project in WA, with grades of up to 7,243ppm TREO from latest drilling with intercepts up to 79m wide.

The results came from the company's July air core and auger drilling program to expand the drill coverage and test the

MANTLE MINERALS RECEIVES GREEN LIGHT FOR ROBERTS HILL DRILLING

Mantle Minerals (ASX: MTL) has received Aboriginal Cultural Heritage clearance to begin an aircore drilling program at the Roberts Hill tenement in WA.

The survey was conducted by the Kariyarra Corporation and Mantle will continue to work closely with the corporation to ensure the avoidance of Aboriginal and Cultural Heritage sites during the drilling.

Around 190 aircore holes will be drilled, totalling 15,000m, to target evidence of concealed mineralisation.

Once completed, significant gold intersections will be followed up with reverse circulation drilling.

Mantle executive chairman Nick Poli says the company is pleased to be working with the Kariyarra Corporation.

"We are proud to work with the Kariyarra Corporation, to ensure avoidance of Aboriginal and Cultural Heritage sites, and delighted to get the green light to get started with our drilling program," he said.

"We're not holding back on this drilling campaign, so we've committed to about 190 aircore drill holes for this campaign.

"Exploration experience in the area tells us that we'll need to persist, so we expect to follow up with reverse circulation drilling once we've confirmed the best areas of focus in this aircore drilling program." **AMR**



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A juvenile stick-nest rat in a breeding enclosure at Mount Gibson Wildlife Sanctuary.



A Mitchell's hopping mouse located during a fauna survey at Mount Gibson Wildlife Sanctuary.

SOUTH32 INVESTS \$2.94M IN WILDLIFE CONSERVATION

South32 (ASX:S32) is providing \$2.94m in funding to the Australia Wildlife Conservancy's (AWC) 131,000ha Mount Gibson Wildlife Sanctuary conservation project to protect threatened mammal species in WA.

The project reintroduces threatened mammals into the sanctuary and their former range, enabling those populations to become self-sustaining over time.

To date, the AWC has reintroduced 10 regionally extinct mammals to the sanctuary, nine of which are nationally threatened.

The Mount Gibson Wildlife Sanctuary has reversed the tide of extinctions amongst the Greater bilby, numbat, Banded Hare-

wallaby, the Woylie/Brush-tailed bettong, Shark Bay mouse, Red-tailed phascogale, Greater Stick-nest rat and the Western Barred bandicoot.

It also houses a 7,838ha fenced enclosure within the reserve, the largest feral cat and fox-free area in mainland WA, providing significant protection for mammals that are reintroduced.

Outside the fence, the AWC has reintroduced the Brushtail possum and Chuditch/Western quoll.

South32 vice president sustainability strategy Holly Buschman says the company is pleased to support the sanctuary with this important project.

"[It helps] to re-establish and protect threatened species, conserving these species now and for generations to come," she said.

"Our support for Australian Wildlife Conservancy is one of a number of collaborations and partnerships that we have in Australia designed to promote improved and sustainable conservation outcomes in the regions where we operate."

Australian Wildlife Conservancy chief executive Tim Allard says the funding will provide significant support to the critical conservation work happening at the sanctuary.

"Mt Gibson Wildlife Sanctuary is an

example of the best-in-the-world rewilding and, once target population numbers are reached, it will deliver a significant increase for around 10% of Australia's threatened mammal species," he said.

"This is the greatest number of species ever restored to a single conservation site in Australia.

"Mt Gibson sets a significant new milestone in Australian conservation for the largest number of reintroductions at a single site."

The AWC is on track to protect and significantly increase the population of nearly 10% of Australia's threatened mammal species. **AMR**

RESPECT IN MINING PROGRAM FOR SAFER WORKPLACES

A suite of new tools to help mining companies create safer workplaces for women is now available as part of the WA Government's *Respect in Mining* program.

The *Respect in Mining* program is designed to support small and medium mining companies to increase awareness and knowledge of the gendered drivers of violence, the impact of gender inequality on women's safety and economic security, and the impact of gendered division in leadership and decision making.

The tools and resources in the program will provide guidance to mining companies on how to set clear standards and procedures for expectations of behaviour, as well as identify and appropriately respond to incidences of sexual assault and sexual harassment in the workplace.

WA Women's Interests Minister Sue Ellery commented on the program.

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

"Workplace sexual harassment is not a women's issue; it's a societal issue which all organisations, employers and individuals have a responsibility to address.

"We need to encourage more women to

join the resources sector by treating them with respect, ensuring their safety and providing support."

Developed by Curtin University's Collaboration for Evidence, research and Impact in Public Health, the *Respect in Mining* toolkit will be available all across the mining sector.

The program provides companies with 19 tools and resources which can be adapted to the workplace, including:

- Guidance on how to gain leadership support and commitment
- A template to develop a sexual harassment and sexual assault policy
- Assessment and audit tools to identify culture or risk of sexual harassment and sexual assault
- Guidance on dealing with backlash and resistance
- Procedures and guidance on how to review and improve practice

The launch of this toolkit complements the start of National Safe Work Month in October.

WA Industrial Relations Minister Bill Johnston says the toolkit will help create safer workplaces but more still needs to be done.

"The *Respect in Mining* toolkit will be available sector-wide and will help create safer workplaces for women in WA," he said.

"While the mining and resources sector has begun its journey to change workplace culture, the [WA] Government acknowledges there is still much more to be done.

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



Woman miner at a coal mine.

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CSIRO'S \$500,000

HELPS INDIGENOUS STEM STUDENTS



CSIRO building in Australia.

Australia's national science agency the CSIRO has donated \$500,000 to the University of Wollongong (UOW) to enable more Aboriginal and Torres Strait Islander students to pursue a career in science, technology, engineering and mathematics (STEM).

The CSIRO Indigenous STEM Scholarship was established in 2019 with the help of a \$30,000 gift from the organisation to support two Indigenous STEM students.

The scholarship forms part of the CSIRO's commitment in supporting the pipeline of Aboriginal and Torres Strait Islander talent which saw the agency contribute

more than \$5m to Indigenous STEM Scholarships this year.

CSIRO director of Indigenous Science and Engagement and Gamilaroi man Dr Chris Bourke says the company is excited to be providing support to the next generation.

"Growing an Indigenous STEM pipeline will enable the science and technology sector, and CSIRO in particular, to engage with Indigenous talent, embed Indigenous knowledge and expertise and to foster thriving careers in science and research for Aboriginal and Torres Strait Islander people," he said.

"These scholarships are a very practical

step because we know that adequate financial support for Indigenous university students is a key factor to overcoming barriers to entry and success in higher education."

The partnership between the CSIRO and the UOW will provide one new scholar with \$5000 each year for the length of their degree.

It is aimed at Indigenous students who are studying a full-time, science, technology, engineering or mathematics degree.

2021 scholarship recipient and Bachelor of Environmental Science (Honours) student

Zara Button says the scholarship enabled her to focus on her career and wellbeing.

"The money from the CSIRO scholarship means I have been able to work less and spend more time doing meaningful activities that could further my career or health. It has also given me confidence in myself that my hard efforts are being recognised," she said.

"I would like to thank the CSIRO for donating generous amounts of money to Indigenous STEM students like me. The money goes a long way in supporting my studies and encouraging me to keep going with it." **AMR**

PRINCELY GRADUATION OF GLENCORE PATHWAYS PROGRAM

Nine participants of Glencore's 2023 New South Wales Indigenous Pathways Program (IEPP) have graduated and secured full-time work in the Hunter region, NSW, with ambassador and former NRL premiership winning half Scott Prince praising their stellar efforts.

The 26-week program, run yearly, provides work readiness and training opportunities for Indigenous Australians who live on, or have connection to, the areas in which Glencore Coal operates in the region.

Glencore Indigenous programs coordinator Carrie Bendeich says the graduates have gained essential job skills and developed a strong foundation for their future careers in the industry.

"This program is designed to create opportunities and inspire Indigenous Australians to reach their career goals," she said.

"The graduation ceremony marks a significant milestone for our graduates, who are now job-ready and poised for career success."

IEPP ambassador and participant mentor

as well as former NRL premiership winning half Scott Prince provides guidance and acting as a sounding board for those involved.

"Mining can provide for the community and as these participants have discovered, help establish themselves with a career so they can provide for their own families," he said.

"To see how much they've all grown in confidence over the 26-weeks is remarkable.

"They weren't overwrought by the challenges they faced, and they supported each other along the way."

The IEPP is divided into two stages: training and job readiness.

These stages include inductions, medicals, life-skills, leadership training and on-site work experience, offering career opportunities in a range of roles, from operators to warehouse assistants, trades assistants and bench support.

IEEP graduate Brianna Duncan says the program has strengthened her confidence and communication skills.



"There's been a lot of support from everyone I was in the classroom with," she said.

"My confidence has grown more than I could ever have imagined and now I've secured a full-time role."

Another IEEP graduate, Adam Gould, says the program has changed his life by helping him to secure full-time employment.

"I joined the program for a better start in life – for my family and my children," he said.

"I knew nothing about mining before I got here, now I know safety, teamwork and how to drive a truck.

"There's no better job in the world."

NSW IEPP coordinator Nat Conroy says she is incredibly proud of this year's cohort.

"This isn't just about a job, it's a career path – this is life-changing," she said.

"I'm so proud of the efforts of our 2023 team and I can't wait to see their achievements in future." **AMR**

\$200,000 MINE REHABILITATION SCHOLARSHIPS IN QUEENSLAND

More than \$200k in post-graduate student scholarships is up for grabs to build on Queensland's reputation as an international leader in coal mine rehabilitation.

Two scholarships valued at \$40,000 a year over three years are now available through the Coal Minesite Rehabilitation Trust to post-graduate students studying at a Queensland university.

Queensland Resources Minister Scott Stewart says the scholarships give two university students the opportunity to pursue postgraduate studies in world-class environmental management.

"Mine rehabilitation is a key part of a company's life of mine planning cycle to ensure better environmental outcomes and help create more jobs for

Queenslanders after a mine is no longer in use," he said.

"Good progress has been made in rehabilitation in Queensland and these scholarships continue to research that will lead to even better practices.

"The scholarships will support ongoing research to identify future improvements and ensure we can have confidence in the industry's ability to manage and reduce its impacts."

Established in 2007, the Coal Minesite Rehabilitation Trust is overseen by the Queensland Resources Council (QRC), the Queensland Government and industry representatives.

QRC chief executive Ian Macfarlane says the scholarships are a practical way to develop expertise in Queensland and lead



(Image source: QRC) QRC chief executive Ian Macfarlane.

the resources sector's future rehabilitation works.

"This scholarship program benefits the whole resources sector by encouraging more research and fresh thinking into how we can continually improve and refine land rehabilitation practices," he said.

"We are now seeing current and former coal mines working to transform to a range



(Image source: QRC) 2018 scholarship recipient Phill McKenna conducting research at New Hope's former Jeebropilly Mine near Amberley.

of productive and innovative post mining land uses including agriculture, renewable energy infrastructure, native ecosystems and community development."

The applications are assessed against key priorities that include sustainable post-mining land uses and addressing long-term water management.

Applications close December 11, 2023. **AMR**

BUILDING PROGRESS:

MANAGING EXTREME HEAT IMPACTS ON RESOURCE OPERATIONS

Rio Tinto is the world's second-largest metals and mining corporation, founded in 1873. The company operates an integrated network of 17 mines across Western Australia's mineral-rich Pilbara region.

The Pilbara is a hot desert region, experiencing some of the most challenging weather conditions in Australia. Maximum temperatures frequently exceed 45°C in summer months, and the Pilbara holds the record for the most sunshine hours in a single day in Australia, at over 10 hours.

These conditions present a unique challenge for mining and resources operations in the region. Being an intensive industry involving frequent outdoor work in extremely remote locations; long, hot days and harsh sunshine are a significant risk to the health and safety of staff.

Balancing operational and production targets with safe work and compliance has a considerable influence on mine site infrastructure requirements. Effective project management requires infrastructure solutions that comply with strict engineering and quality standards while remaining

on budget, limiting maintenance requirements, lowering environmental footprint and being suitable for transportation to and installation in extremely remote locations.

How do you balance all these requirements while still ensuring a high-quality product from a trustworthy supplier?

Since the early 2000s, Rio Tinto has trusted DomeShelter Australia for durable mine-site infrastructure for a range of applications.

The trusting relationship between Rio and the DomeShelter™ Team meant that when a storage solution for volatile flammable gases was needed for their Brockman 2 mine site, they knew who to reach out for to ensure a compliant solution that responded to all their challenges.

The gases needed to be protected from the violent Pilbara climate, with sufficient storage space, ventilation, and easy access. Needing to maximise storage inside and outside, DomeShelter Australia used the versatility of containers by unique-

ly mounting four DomeShelter™ Fabric Structures on both 'inside' and 'outside' configurations. This gave Rio more flexibility with sizing, meaning less square meters covered (equalling lower overall costs) while having the 'peace of mind' of a proven, intelligently engineered solution!

There are dozens of DomeShelter™ Structures across all of Rio Tinto's Pilbara mine sites. Each site has different shelters tailored to the needs and use cases involved – no two are the same. Every shelter is fully engineered to comply with AS1170.2 - Wind Actions, able to withstand up to Australian Wind Region D Cyclonic wind speeds.

This is a result of DomeShelter Australia's 'Fit-For-Purpose approach'; a comprehensive three-step process that prioritises thorough needs analysis as opposed to simply quoting and manufacturing an off-the-shelf product. This delivers better outcomes for clients, with solutions that address every pain point that guarantees satisfaction well into the future.

Along with Rio Tinto, DomeShelter Aus-

tralia is trusted by some of the largest Resource companies in the world, including FMG, BHP, Talison Lithium, Barminto, Chevron, Centamin, and many more.

Specialising in customised solutions, DomeShelter™ Structures can be optimised to suit virtually any application, with a range of add-ons available for specific use cases – add-ons include lighting, gutter systems, internal walls, tropical roofs, endwalls, doors, and the list goes on. They offer significant benefits over steel sheds, using substantially less materials and typically not needing lengthy planning and approvals processes.

DomeShelter Australia has developed an unrivalled knowledge in every area of Fabric Shelter manufacturing over its 25+ years in the industry, with over 8000 Shelters installed in over 48 countries.

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(Image source:
Australasian
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DRILLING IN MINING: BORING DOWN TO THE DETAILS



Australasian Drilling Institute's Illi Cava.

Drilling in Australia's mining sector continues to hum along judiciously thanks to a modest rise in exploration expenditure reported in the June quarter and the promise of more greenfield drilling activities stemming from worldwide critical mineral demand.

According to the Australian Bureau of Statistics (ABS), petroleum exploration expenditure in Australia fell by 3.7% in the June 2023 quarter, although mineral exploration expenditure rose by 0.8% off the back of total mineral exploration expenditure last year of over \$4b.

Further data from the ABS shows that exploration expenditure in and around known brownfields deposits last year was \$2,784.6m and expenditure greenfields deposits was \$1,270.3m.

The scope of brownfields drilling totalled 8,195,700m and at greenfields sites totalled 3,504,000m.

Deep-diving into the data, exploration spending by commodity last year was: gold \$1,524.4m, copper \$572.6m, iron ore \$715.4m, silver-lead-zinc \$103.2m, cobalt and nickel \$313.2m, coal \$240.1m, uranium \$21.7m, mineral sands \$66.8m, and spending associated with minor commodities (such as lithium, manganese, molybdenum, phosphate, tin, tungsten and vanadium) \$482.6m.

WA continues to attract much of the country's exploration drilling activity due to the state being home to most of Australia's iron ore, gold, gas, and lithium production and over \$2.5b exploration expenditure was seen last year.

This was followed by exploration expenditure in Queensland of \$553.2m, South Australia \$165.2m, NSW \$351.0m, Northern Territory \$198.6m, Tasmania \$40.6m and Victoria \$201.3m, as reported by the ABS.

Calibrating Supply with Demand

According to industry research company IBISWorld, both oil and mineral exploration drilling demand has been volatile in recent years and is considered one of the riskier mining variables as companies seek to determine whether resource deposits are economically viable.

Greenfield exploration's annual expenditure often fluctuates significantly, in line with junior miners' capacity to access capital and demand for mining services falls when mining sentiment weakens.

Rising operating costs among downstream mining companies can also play a role in constraining exploration drilling expenditure, while mining companies can face cost pressures due to the current tight labour market and supply chain problems.

Elevated commodity prices have supported mineral exploration demand however, with gold, iron ore, copper, nickel and coal prices having all risen over the past five years.

Critical mineral demand is also rising, providing an opportunity for new entrants and driving up exploration expenditure.

According to veteran driller and managing director of the Queensland based Australasian Drilling Institute, Illi Cava, fluctuations in drilling demand are par for the course in the sector and the robustness of Australian mining will likely weather any softness in demand.

"In my view the last 18 years has taught us that market fluctuations are normal and we have been lucky here in Australia with demands for our resources continuing to be strong" he told The Australian Mining Review.

"There are exciting new frontiers opening up with rare metals and exploration for renewable energy requirements continue

to grow and these new fields coupled with the traditional resources sectors continue to provide a positive outlook beyond any slowing trend that may become apparent to our students", he added.

At the coal face of supply and demand for drillers in the mining sector since 2005, the Australasian Drilling Institute says that in the last couple of years of years post COVID-19, it has experienced strong demand for skilled workers and for the certification of experienced and existing workforces.

"ADI's pre industry training program has been under pressure to supply clients and employment outcomes for successful participants", Mr. Cava said.

"Although there has been feedback from some clients of a slowdown within the industry, this hasn't yet been reflected in personnel demand for us, although it can take time to filter through.

There has been an increase in requests to certify or upgrade certification of existing workforces and this seems to indicate competition amongst the companies as contracts are reviewed or coming up for tenders."

The organisation says that it believes a larger share of its students and drillers more generally are likely to be working within existing mine-based drilling projects as opposed to new exploration projects, but that the sub sector is a moving picture.

"In our corner of the industry there is always a challenge to ensure the pipeline of trained personnel is always maintained to respond to industry needs," Mr. Cava said.

"With statutory demands placed on companies for qualified workers, significant pressure is applied to partnering registered training organisations to maintain a

balance between flexibility in service and internal quality requirements.

"In a competitive environment like drilling where drilling rigs and crews could be exposed to a number of drilling methods over the contracted term and maintaining crew certification to reflect their skills remains an ongoing challenge.

"Generally, drill rigs are easier to acquire however providing a complement of competent crew is always a perennial challenge."

Directional Drilling

As previously reported in the **Australian Mining Review**, mining generally is a high-risk, high-reward enterprise, the success of which is dependent on a range of factors.

For companies involved in the exploration phase of mining, and for those in the capital markets who invest in mineral exploration, the risk-reward ratio and the problem of uncertainty is perhaps even more extreme.

Accurate information is the foundation for success, and whether it is an established mine looking to extend their reserves, or a company engaged in remote greenfields exploration, the enterprise with the sharpest picture and most comprehensive assessment of a zone of interest has the best chance of attracting and sustaining capital investment.

For several years now, some drilling companies have deployed sophisticated deep hole directional drilling that push Australia's technological capabilities in mine development and exploration further than anywhere else in the world by making assessments of potential resources more detailed, accurate and comprehensive than ever before.

It achieves this heightened degree of in-

telligence through its innovations in directional drilling.

While vertical drilling has been successfully deployed for decades, and is often still the most cost-effective technique, directional or horizontal drilling provides the capacity to manoeuvre the drill bit and alter the direction of drilling deep underground.

DDH1 co-founder and managing director Murray Pollock previously described the way the technology works and its benefits.

"We use downhole motors to angle the drill holes as we descend. Internally, they are like a mono-pump," he said.

"They have a very small, subtle bend right on the end, about half a metre behind the drill bit.

"Once the parent hole is drilled, we lower the directional bit to the bottom of the hole and then run a survey tool down and orientate that tool in the direction we want it to go.

"Sometimes we deal with live survey equipment down there but most of the time we pull that survey gear out.

"Once we start pumping, only the drill bit is turning and because it is on a slight angle to the rest of the tool it then drills off in the direction that we set it."

After drilling a single surface parent hole to a depth of around 1000m, the directional drilling capabilities branch out and drill a series of holes, termed 'daughter holes', to depths of 3000m and beyond.

These holes intersect the target deposit from multiple points and angles.

In many cases, directional drilling allows the target deposit to be drilled at flatter angles than conventional drilling and increases the chances of not only intersecting areas of interest but also giving a truer indication of their width and orientation.

This leads to more accurate modelling of the structure and quantity of any resource.

Deep drill holes are the end result of time-consuming work required to define and ensure spatially accurate intersections of planned drill targets.

Investors turning to drilling again as exploration spending grows

With international financial markets finally coming in for a soft landing after the turmoil of global inflation and rising interest rates, mining investment and exploration activity is starting to head in a positive direction.

The latest Federal Government's Resources and Energy report noted that miners have invested \$12.8b in the June quarter 2023, up 11.9% from the June quarter 2022.

In quarterly terms, investment rose across the board, with particularly notable growth in 'other mining', which includes lithium and some other critical minerals.

With commodity prices remaining relatively stable and the hunt for battery and other critical minerals accelerating, there has also been a noticeable jump in exploration activity.

According to data from the Office of Australia's Chief Economist, "in trend terms, exploration activity is rising."

Industries recording significant growth in exploration expenditure include iron ore (up by 31% in the June quarter), copper (up by 30%), gold (up by 14%), nickel (up by 7%), and 'other minerals' (up by 13%), which includes lithium, other base metals and other metals.

The Resources and Energy report suggested that exploration spending is a leading indicator of broader capital investment, and recent growth suggests interest is rising in base metals and critical minerals following recent strong price outcomes.

With so much new activity happening, explorers are uncovering exciting new plays and discovering the new mines of the future – leading to further new drilling activity.

Some of the exciting recent and current exploration stories happening across the nation include:

ABx opening up major rare earths play in Tasmania

Rare earths are forecast to be in major demand as a critical mineral in future technology development.

One the companies setting itself up to be a major Australian player in the rare earths space is ABx Group, which has discovered world class ionic clay rare earth deposits in Tasmania.

The company continues to grow its footprint in the Apple Isle and has been granted two significant exploration licences covering the southwards extensions of the Portrush REE discovery area near Launceston in northern Tasmania.

The two tenements, EL27/2022 and EL28/2022, total 483 sq. km and have been granted for an initial term of five years. They are located ~52 km east of ABx's major Deep Leads / Rubble Mound REE project.

The company is planning to test the prospectivity of the new permits with drilling as soon as possible.

Azure Minerals has promising lithium discovery at Andover

You know you have found something exciting when other companies start to refer to your success in their promotional material.

That is the case for Azure and its high-grade Andover discovery in the Pilbara.

Covering 108 sq. km, the Andover Project is located 35km southeast of Karratha.

Multiple diamond core and Reverse Circulation (RC) drill rigs are operating on site as the company also investigates base and precious metals opportunities.

Bryah secures manganese mining licences

Manganese is another mineral that has been named as critical to the new energy future and Bryah Resources has welcomed the grant of two Mining Licences at the Bryah Basin manganese project in Western Australia.

Bryah (49%) and OMM (51%) have a Joint Venture (JV) to undertake exploration to test targets in the area.

The Lake Johnston tenements are prospective for battery metals lithium and nickel. The corridor near Lake Johnston contains significant mines and discoveries of nickel and lithium, including the Mount Holland Lithium Mine and the historical Maggie Hays/Emily Ann nickel deposits.

DevEx Resources chasing uranium at Nabarlek project

DevEx Resources is preparing to deploy a second drill rig to its project based in the Northern Territory which comprises a significant 4,700 sq. km tenement package located in the Alligator Rivers Uranium Province, known for its world-class uranium deposits.

Dreadnought kicks off discovery drilling at Tarraji-Yampi

Dreadnought Resources has commenced RC and diamond drilling at the Tarraji-Yampi Project, located in the Kimberley Region of Western Australia.

The long-anticipated drill programme to follow up on the 2021 Orion Cu-Ag-Au-Co massive sulphide discovery.

The company has identified 13 Orion look-alike targets for drilling.

The Tarraji-Yampi Project was off limits to exploration from 1978-2013, a period that saw over 50% of Australia's mineral deposits discovered through the application of modern geophysical and geochemical techniques and an evolving understanding of mineral systems.

The region is known to contain outcropping quartz copper-gold lodes that were mined for copper on a small scale in the

early 1900s and explored briefly by WMC in 1958 and ACM in 1972.

Galileo in game-changing Callisto discovery

One of the most significant recent local discoveries was Galileo Mining's Callisto find in WA.

The discovery of the nickel-palladium mineralisation at Callisto was a game-changer for the company and its 100% owned Norseman project.

The company is now assessing assays of historic samples from 2018 drilling which show significant palladium and nickel results 3km south of the Callisto discovery.

The samples have now been re-assayed for PGE (platinum group elements) in light of the Callisto palladium and nickel discovery in 2022.

Approximately 3,100 metres of RC drilling was completed over 58 drill holes in 2018 to define the "Goblin" cobalt laterite resource.

Greentech Metals hits lithium at Ruth Well

Greentech Metals has uncovered additional high-grade lithium up to 1.8% lithium oxide from rock chip sampling at its Ruth Well Project in the West Pilbara area of WA.

The company says the results confirm lithium mineralisation within the Kobe prospect area, which has increased from 6-7.5km in strike length.

Kula Gold completes auger work at Rankin Dome Project

Kula Gold Limited has reported the completion of a 249-hole higher definition shallow auger sampling program at the Rankin Dome Project near Southern Cross in WA.

A 900m RC drilling program of 6 x 150m deep drillholes has commenced in conjunction with drilling partner Stark Drilling.

Warriedar Resources ready to test Golden Range and Fields Find

The company is set to drill over 40,000m at its deposits across the course of this year, targeting the potential discovery of both gold and base metals mineralisation.

The projects sit in the middle of the highly active Murchison exploration and mining province of WA. **AMR**



(Image source: Australasian Drilling Institute Queensland.)



MORE INTEGRATION. LESS HEADACHES. THAT'S IMPACT!

Mining, quarrying and civil excavation projects are complex, heavily regulated, and require experienced heads and hands. There is absolutely no room for error, particularly when drilling and blasting are involved.

In these types of environments, challenges like noise, vibration, air blast, and fly-rock, add to the already difficult terrain where blasting may have previously been deemed impossible. With stakes so high, you need a drilling and blasting partner that can guarantee safe, reliable and efficient blasting, while delivering predictable, cost-effective and long-term results.

For over 30 years, Impact Drill & Blast (Impact) has become the trusted partner in the quarrying and mining space, helping companies across the country successfully complete their drilling and blasting projects.

Impact is the product of an amalgamation of four Australian drill and blast companies by Yahua Industrial Group, one of China's largest explosives manufacturers. It has transformed into what is now one of Australia's largest drill and blast businesses with bulk explosives supply capabilities.

As Australia's only fully integrated drilling and blasting company, Impact offers a one-stop-shop for rock-on-ground services, from blast design, mark-out and surveys, to drilling, loading and shotfiring.

According to Impact Manager, James Woodgate, what makes Impact different is that their complete service offering, technical expertise, modern fleet of drill rigs, MPUs (mobile processing units), and bulk explosives manufacturing capability.

"Our clients benefit from working with a single supplier, the opportunity to work collaboratively and a faster turnaround on shots," Mr Woodgate said.

"There's no more waiting for a blasting contractor to mark up a shot or a separate drilling contractor to drill the holes. We're fully integrated and can provide all the solutions under one roof, which improve safety, reduce costs, abbreviate timelines,

and boost the overall business performance of a clients' asset.

"We also give our clients peace of mind knowing they're dealing with a team of experts at every stage of their project, a safety record that's second-to-none, and one that introduces new technologies for the best results."

More Innovation. Less Waste.

Blasting is by no means a simple science. A strategically executed drill and blast plan plays an influential role in solving downstream issues such as wear and tear associated with the crushing process.

By reducing the size of fragmented rock through optimised blasting, asset owners can benefit from increased production throughput, lower maintenance and labour costs, and a significant reduction in wear and tear of their crusher.

A suite of technologies combined with the right explosives mix are critical in fragmenting rocks into better quality fines at less cost and in shorter time spans.

Mr Woodgate said there is more to rock

breaking than it seems, and there are a number of variables involved that determine the final outcome.

"You need to consider burden, charge length, explosive type, powder factor, initiation systems, drill hole diameter and depth, drill spacing, stemming, timing and sequence – and that's before you bring compressional stress wave velocity, rock specific gravity and rock strength into the equation," he said.

"An excessive number of drill holes can increase blasting costs considerably, due to the extra drilling, bulk product and accessories required and can often yield much less cubic metres of material than the design.

"Selecting the most economical hole diameter for the job, based on environmental parameters and geology, is key to a successful blast.

"A larger diameter hole can mean less drilling, labour and accessories are used in the blast activity.

"Accuracy of the designed pattern versus actual drilled and the warranted place-

ment of holes, particularly around the perimeter of a free face, is also a key factor.

"All of these support improved safety and more bang for less bucks. The efficient placement of explosives and timing of the charge are the dominant factors in developing good fragmentation."

Impact utilise electronic detonators, drone surveying, GPS guided drills, and high energy RedStar emulsion to achieve the best blasting outcomes. Combining these technologies and techniques contributes to better rock fragmentation results, and therefore more refined material, which can be processed through crushers at higher volumes, subsequently improving a client's profitability.

The company operates one of Australia's largest Sandvik drill fleets with more than 40 rigs – from GPS-guided drills to speed up the delivery of broken rock, to 3D drone surveying technology used for profiling a rock face for the best blast pattern design.

"Since we introduced electronic initiation into the market, through a strategic partnership with electronic detonator manufacturer Davey Bickford ENAEX (DBE), our clients have realised significant benefits," Mr Woodgate said.

"Our programmable detonators allow timing from zero to 14,000 milliseconds in 1ms intervals, meaning blasts can be modified to suit operator needs and the specific geology of an area.

"Using RedStar, our unique high energy emulsion formulation, in conjunction with electronic detonators and interactive timing, allows us to optimise blasting with less holes in the ground.

"Considerable savings can be achieved on energy costs at the crusher and load and haul rates can be improved. Wear and tear on plant is also reduced. Throughput in tonnes per hour increases and, as fragmentation is better, the risk of equipment breakdown is reduced."

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

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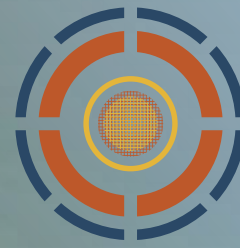
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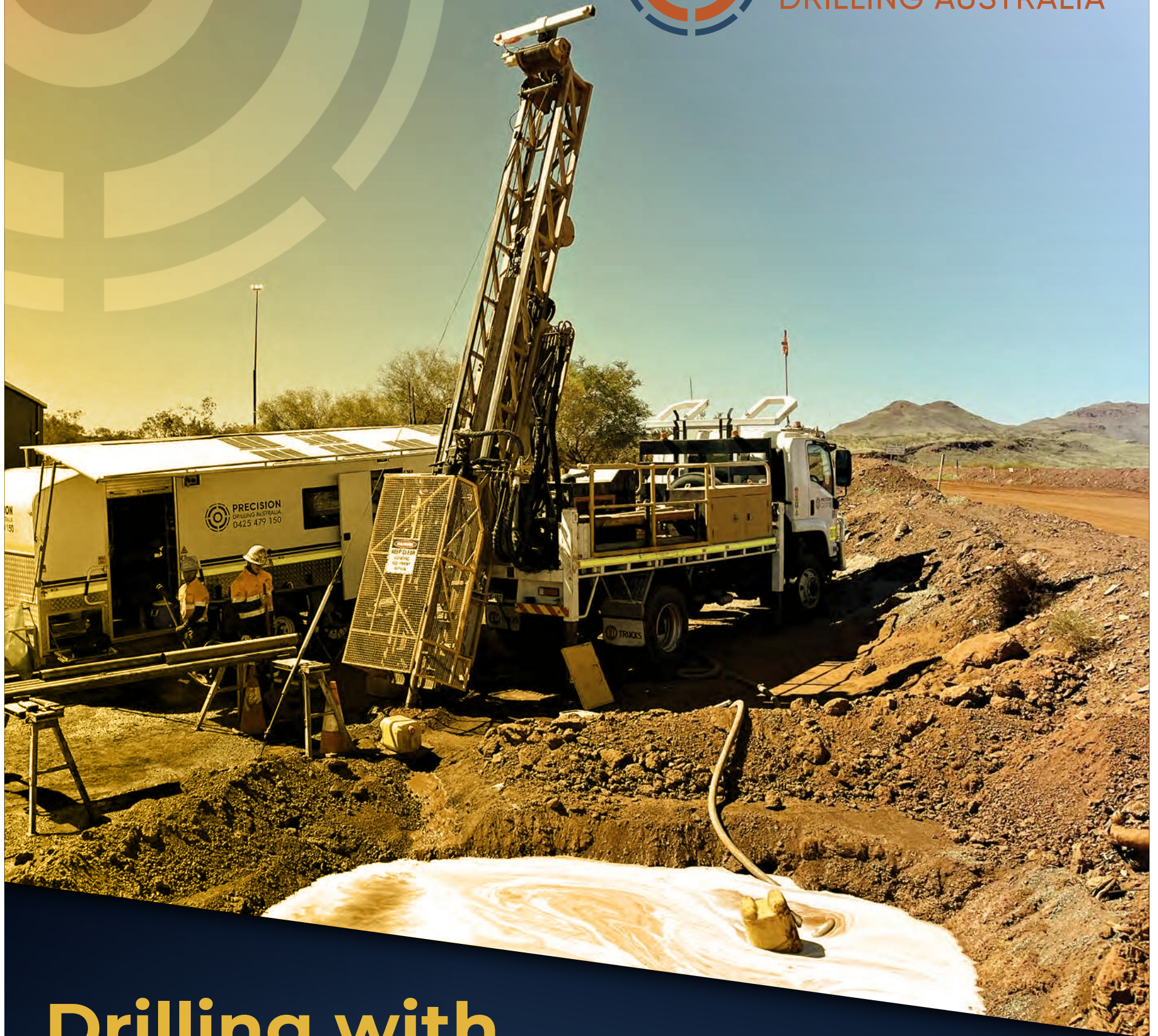
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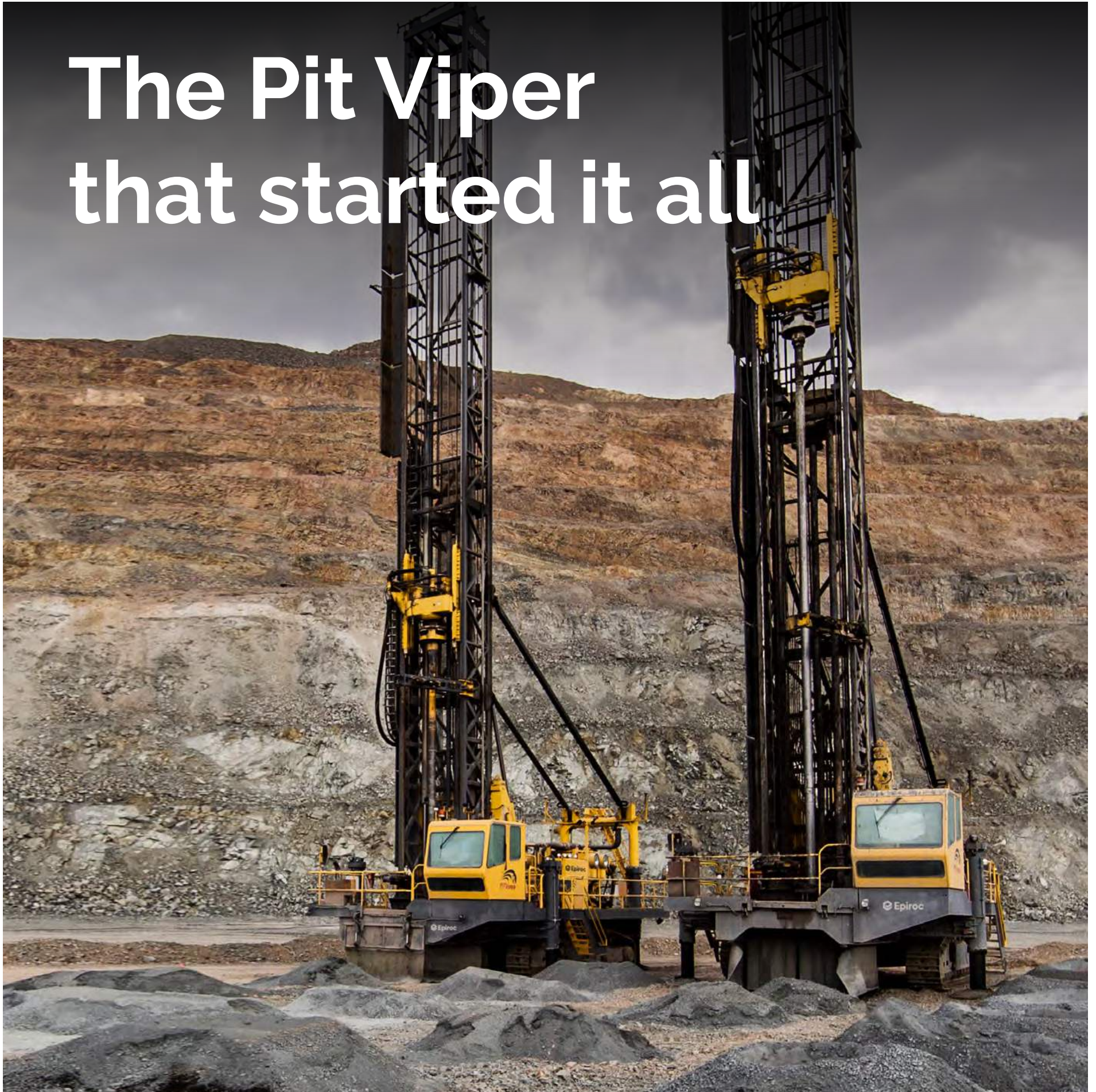
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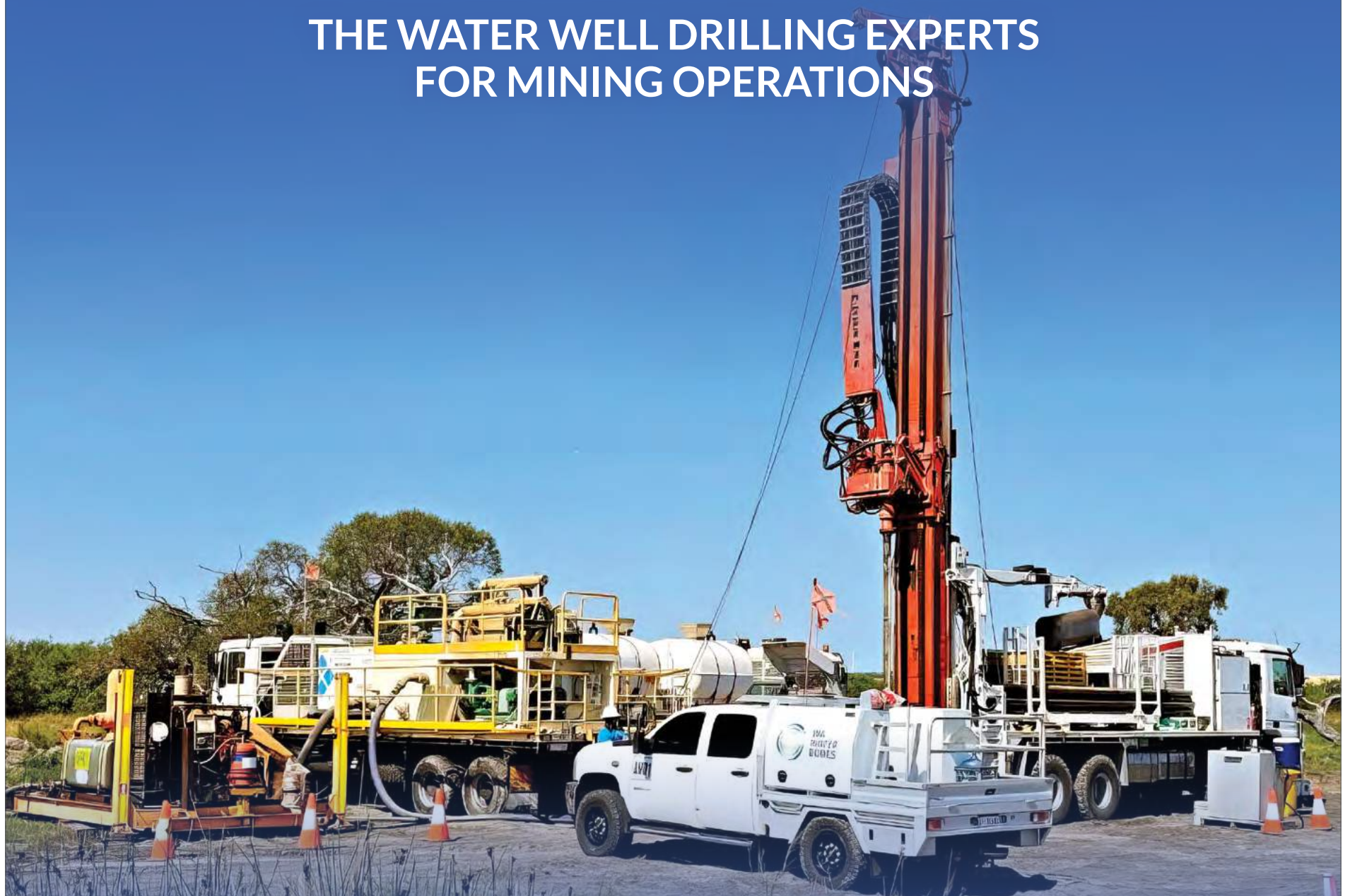
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WORKPLACE HEALTH & SAFETY 2023 EVENT WRAP UP

(Image source: IEC) Aerial view of the Workplace Health and Safety Show.

By Ashleigh Melanko

The Workplace Health and Safety Show is a free annual two-day event providing occupational health and safety (OHS) professionals with the latest information, products, equipment and innovations to make compliance easier.

The show was first held in 2018 and focuses on psychological safety, safety technology, major hazards, personal protection, height safety, health and wellbeing and cleaning and hygiene.

With constantly changing safety and wellbeing legislation, it can be difficult for employers to stay up-to-date.

The show is the perfect opportunity for OHS professionals to gather under one roof to find all the resources they need to help keep their workers safe.

The Workplace Health and Safety Show comprises conference presentations delivered by industry leaders, interactive forums, panel discussions and a trade show where companies showcase their safety, hygiene and wellness products and services.

WHY IS THE WHS SHOW IMPORTANT TO MINING?
While the mining industry has made great strides in improving the health and safety of workers over the past few years, it's still one of the sectors with the highest rates of injuries and fatalities.

According to Safe Work Australia, in FY21 the mining industry recorded four fatalities and 2798 workers compensation claims.

The average value of compensation payouts is over \$35,000 while the average time lost due to injuries and fatalities is over 10 weeks.

In order to attract and retain investment and top talent, and ensure productivity

and profitability, the mining industry must demonstrate a commitment to worker safety and wellbeing.

Implementing new technology solutions is a key consideration to keep operations safe, as innovations such as artificial intelligence, mobile and cloud-based solutions, sensors and wearable technology have demonstrated a commitment to worker safety and wellbeing.

Wearable technology addresses some of the greatest safety risks to workers, such as body stress injuries, which are responsible for 40% of all claims in the mining sector.

Wearable technologies use small sensors to track and detect worker's movements and signs of strain and stress, just to name a few.

This makes it possible to continuously monitor workers and quickly respond to potential risks.

When coupled with artificial intelligence, wearable technologies can monitor and analyse sensor data, enabling improved supervision of worker safety, rapid intervention in the event of potential risks and the delivery of personalised safety training to workers as needed.

2023 EVENTS
This year, the Workplace Health and Safety Show took place in Brisbane for the first time ever — from May 31 to June 1 — and then in Sydney — from September 20 to September 21.

Visitors to the 2023 shows learned about regulatory changes as well as updates to their obligations and requirements.

They also learned about the latest technologies, tools and resources available to help meet their obligations and create safer and healthier workplaces.



(Image source: IEC) JESI general manager of sales Adam O'Neill speaking at the show.



(Image source: IEC) One of the many stalls showcasing its products.

This year saw the launch of the Cleaning & Hygiene Zone — an area of the show dedicated to hygiene and cleaning products, tools, equipment and services.

SafeWork NSW Inspectors also chaired a panel to provide real-time information and answer questions relating to regulations and employer obligations. **AMR**

2024 EVENTS

Top industry leaders and pioneering innovators will return to Melbourne and Sydney next year for the annual event with 2024 expecting to be even bigger with more exhibitors, high-profile presenters and more visitors.

Attendees will be face to face with cutting-edge and targeted work and safety solutions and stay updated on the latest products, resources and policies.

MELBOURNE

Date: May 22 and May 23, 2024
Time: 9am to 5pm
Venue: Melbourne Convention & Exhibition Centre
Price: Free

SYDNEY

Date: September 18 and September 19, 2024
Time: 9am to 5pm
Venue: Sydney Showground
Price: Free

EVOLUTION EVOLVING

WITH \$250M MUNGARI EXPANSION

Evolution Mining (ASX: EVN) is right on target with its expansion plans for the Mungari mine in WA. The company recently awarded a key contract to GR Engineering Services to complete the plant expansion works at Mungari.

These \$155m works are within the project budget and schedule as part of the company's commitment to invest \$250m to increase the site's processing capacity from 2mtpa to 4.2mtpa.

When the company announced it had awarded the contract to GR Engineering on 29 September 2023 as part of the Mungari Future Growth Project, it said that planning for the project was well progressed.

Initial engineering design and procurement works have now commenced, with site works expected to commence in mid-January 2024.

The project has an estimated 30-month construction period including long-lead items and approvals, with commissioning expected by the end of the March 2026 quarter.

Targeting gold production of 200,000ozpa for the life of the mine, this project is expected to reduce Mungari's All-In Sustaining Cost (AISC) by 18% to \$1,750 per ounce.

"The award of this contract is a major milestone for the Mungari Future Growth Project," Evolution Mining managing

director and chief executive Lawrie Conway said.

"It secures the critical processing plant infrastructure within our budgeted costs, locking in over 60% of the project costs, and secures a delivery time within the approved project schedule.

"The Feasibility Study established a sound investment case with an internal rate of return for the project of between 19% and 28%, at a conservative \$2,400/oz and spot price of \$2,965/oz respectively."

Evolution Mining has a strong platform of high-quality assets with an average reserve life of more than 14 years.

Background

The Mungari operation is located 600km east of Perth and 20km west of Kalgoorlie.

The mine operated above plan in FY23 to produce another solid contribution to the group's overall gold production result with gold production of 135,592oz at an average AISC of \$2,083/oz.

Production was above original production guidance of 127,500oz and within cost guidance of \$2,040/oz (+/- 5%).

Operating mine cash flow was \$107.9m, sustaining capital was \$34.2m and major capital was \$58.1m.

Prolific location

Located in a region renowned for its prolific gold production, the history of the mine traces back to the discovery of the Frog's Leg deposit in 1999, marking an important milestone in the region's mining history.

Over the years, the site changed hands and grew in both size and significance, with Evolution Mining acquiring Mungari from La Mancha in 2015.

The neighbouring Kundana operation – including underground mines at Raleigh, RHP and Millenium – was added to its portfolio in August 2021.

A testament to the company's commitment to investing in high-quality assets, the most recent acquisition elevated Evolution Mining to become one of the largest employers in the region.

Mungari has a large footprint across both the Coolgardie and Kalgoorlie-Boulder shires with one open-pit and three underground operations, as well as an on-site processing plant, capable of safely

and reliably producing approximately 130,000ozpa of gold.

The recently approved mill expansion is expected to increase this output to close to ~200,000ozpa between FY27 and FY32.

Regional support

Through Mungari, Evolution is contributing to the economic growth of the region, creating valuable employment and business opportunities for neighbouring communities.

In FY22, approximately \$50m was spent with local businesses and suppliers.

Evolution Mining is committed to creating sustainable value for stakeholders in an environmentally and socially responsible way.

Environmental and social concerns are always placed at the forefront of operations.

Throughout the history of the Mungari operation, there has been an unwavering commitment to improve environmental management strategies and invest in the community.

This is demonstrated through the company's commitment to progressive rehabilitation, having completed 35ha of rehabilitation earthworks in 2023.

Additionally, close to \$1.2m has been delivered across the community through partnerships, sponsorship, and donations since 2020.

The journey has not been without its challenges, but every step has provided invaluable lessons about resilience, innovation, and the spirit of collaboration.

Evolution is looking forward to continuing to build on the rich history of the Mungari operation, contributing to the future of gold mining in Australia.

The expansion will ultimately unlock regional ore sources and reduce the processing unit costs by about 30%.

As a result, Mungari is predicted to

safely and reliably produce close to ~200,000ozpa between FY27 and FY32, with an 18% reduction in AISC across its 15-year mine life.

Most of the project involves upgrades to the process plant flowsheet consisting of:

- primary crushing
- coarse ore stockpile with reclaim tunnel
- SAG and ball milling circuit with classifying cyclones
- gravity circuit
- leach feed thickening
- leaching / adsorption circuit
- elution / electrowinning / carbon regeneration
- upgrade reagents storage and tailings area

Long-term view

The expansion was envisaged when Evolution Mining acquired the Kundana and East Kundana properties in 2021 and formed part of the company's due diligence.

Having successfully integrated the operations, this was the next logical phase of making Mungari a cornerstone asset of Evolution Mining.

The large Mungari tenement holding includes positive exploration upside, which offers future potential for the company.

Evolution Mining expects to further refine its knowledge of the ore bodies in its holdings to strengthen the resources and reserves.

The lower processing costs and higher open pit mining rates (at lower unit costs) reflects a move to three long-term mining centres.

General Manager Evolution's Mungari Operations Scott Barber commented on the expansion.

"This is an exciting time for Mungari, our local business partners and stakeholders," he said.

"The expansion reflects Evolution's commitment to the region and confidence in the potential of Mungari." **AMR**



General Manager Evolution's Mungari Operations Scott Barber.

TUNDRA RESOURCE ANALYTICS

TRUSTED BY EVOLUTION MINING
FOR MUNGARI 4.2 WORKS



Managing Director Laura Jeffery.



Financial Modeller
Duncan Freeman
and Financial
Analyst Tom Norris.

TUNDRA Resource Analytics is a consultancy providing an array of business analysis, project evaluation, project management, financial modelling and business and systems transformation services.

Having been trusted by Evolution on a number of major projects in the past, TUNDRA was picked to deliver work for Mungari 4.2 — a name which comes from the increase of processing capacity from 2.6mtpa to 4.2mtpa. This is also known as the Mungari Future Growth Project.

“We have been trusted by Evolution to work across a number of major studies in the past, having provided a suite of financial evaluation, audit & chapter writing services across the Lake Cowal Underground feasibility and the Ernest Henry Extension Project pre-feasibility studies,” Managing

Director Laura Jeffery said.

“Evolution approached us to provide similar services on Mungari 4.2 and we were thrilled to partner with them again.”

TUNDRA lead the financial evaluation workstream of the Mungari 4.2 study and leveraged the skills of Duncan Freeman, an experienced Big-4 trained mining industry financial modeller.

TUNDRA also supported the financial modelling with an extensive, independent model audit, source data and assumptions control, financial evaluation and analysis of results.

“Outside of the study we have executed an Equipment Strategy Optimisation project at Mungari, evaluating the NPV impact of a range of maintenance strategy scenarios,

identifying significant opportunities for cost savings and pinpointing the most economical point of replacement for their underground mobile fleet,” Laura said.

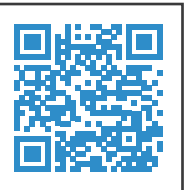
“This work ties beautifully into the study because it builds the full lifecycle costs for the fleet tailored to the specific life of operations – providing an extra level of granularity on the cost inputs to the financial model.”

As part of every Evolution study, TUNDRA participates in a thorough Independent Peer Review (IPR) process where initial study results are presented to a panel of experienced experts and Evolution leadership team members who test the assumptions, inputs, processes and results. Further, TUNDRA is leaving the Mungari

operation with a tool that is complex enough to accurately represent the operation but simple and straightforward enough to be easily used by operational teams.

“In addition to having become a trusted financial modelling and project evaluation partner on major capital studies we are experienced integration and separation project managers, having led projects triggered by some of the most significant mining industry acquisitions & divestments over the past six years,” Laura said.

“We draw on a diverse skillset in our team across the areas of finance, modelling, project management, systems transformation leadership, change management and stakeholder engagement, audit, strategic operations planning and process improvement.” **AMR**



Exposing value buried deep in your business.



L-R: Financial Modeller Duncan Freeman, Financial Analyst Tom Norris and Managing Director Laura Jeffery.



TUNDRA is the go-to resource for project management, systems transformation, financial modelling and evaluation, data analytics, asset optimisation and acquisitions and divestments.

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MAKING MOVES IN MOUNT ISA



Glencore is one of Australia's largest producers of metals and minerals including zinc, copper, cobalt and nickel, all of which will play a critical role in the world's transition to a net zero future.

As a flagship copper-zinc mining operation, Mount Isa Mines (MIM) is home to the only copper smelter and refinery in Queensland, Australia.

It is the hub of Glencore's copper and zinc operations and the country's largest industrial asset.

MIM comprises two underground mines – George Fisher and Lady Loretta – located approximately 20km and 110km north of the city of Mount Isa respectively on the land of the Kalkadoon people.

A growing appetite for minerals

The global demand for critical metals and minerals continues to grow in response to societies shift toward renewable technologies and net zero targets.

It is therefore no surprise that Glencore is investing in the future of its underground mining assets and ramping up production accordingly.

MIM welcomed Prime Minister Anthony Albanese back in August 2023, a step that highlighted the importance of the country's metals and minerals sector, and its economic contribution to the region.

Glencore head of zinc and copper business Sam Strohmayer says MIM was delighted to

host the Prime Minister and pleased that he was able to take time to visit the zinc operations.

"We were also grateful to have the opportunity to discuss the increasing importance of metals and minerals in Australia and the contribution our operations make to the region," he said.

"Mount Isa is one of Australia's most successful mining towns and this is in large part to the support we get from the community."

In 2022, Glencore's Queensland metals business employed 4,450 people and contributed \$2.4b to the economy.

This included \$1.7b spent on goods and services, which enabled the business to work with approximately 2,130 suppliers.

Innovation at its core

Earlier this year, MIM announced its Copper Concentrator Metallurgy team had designed an innovative process for recovering silica.

This process involves converting a previous waste stream to a value-adding product, making MIM a more sustainable operation and reducing the final tailings footprint.

The silica-rich stream is recovered from tailings by separating the fines from the coarse material.

This is then used for flux in the copper smelter.

The tailings would otherwise be sent to the tailings storage facility.

In the smelting process, silica is used to create the fayalite slag, which removes iron and other elements from the concentrates.

Silica flux lowers the melting point and density of the slag.

Metallurgy Copper Concentrator superintendent Lucian Cloete says the project's successes include increased copper recovery, saving on equipment maintenance and consumables, as well as delivering a low-cost flux material.

"We've benefited from a 2-3% gain in metal recovery, while reducing the cost of reagents and power," he said.

"Another benefit is repurposing the flotation bank used for the silica, which is now used for additional pre-float capacity for MICO ore."

In an effort to keep MIM's operations productive, compliant, and at the forefront of best practice, a new landfill site was constructed to manage waste generated onsite, without the need for it to be transported to the city council's landfill.

This new landfill, located on the Kennedy Siltstone Open Cut overburden stockpile to the north of the current landfill, was designed and constructed to the highest standards in accordance with the Environmental Authority.

The new landfill covers a footprint of over 32,000m² and is estimated to occupy 184,000m³ of waste generated from within the mine site.

A legacy spanning 100 years

In 2023, Mt Isa marked 100 years since prospector John Campbell Miles signed the mining lease he named 'Mount Isa', putting the mineral rich region on the world map.

Officially formed in 1924, MIM continues to serve as the cornerstone of Queensland's economic growth with its founder's legacy still present in the Mount Isa community today.

MIM director of mining Etienne Moller says the company is proud to have played an important role in Mount Isa's transformation over the century.

"From spearheading the revitalisation of the state's railways, to becoming Australia's largest single creator of export income in the 1950s, the mine and this community share a rich history we should be very proud of," he said.

"From humble beginnings as a digger's camp in 1924, today Mount Isa is a thriving city and the commercial and industrial centre of northwest Queensland.

"Mount Isa Mines is proud to be a part of the history of the region and we look forward to celebrating this milestone with the Mount Isa community this year." **AMR**

GREEN, GREEN GRASS OF LITHIUM'S HOME



Public lookout of the historic Greenbushes mine.

Nestled amongst the beautiful southwest region of WA, lies one of the world's largest high-grade lithium ore body.

The small historic town of Greenbushes is home to the world's premier lithium asset, identified during a drilling program between 1977-1980.

Talison Lithium's Greenbushes lithium operation supplies mineral concentrates globally through Bunbury and Fremantle ports, as well as locally to downstream refining facilities owned and operated by its shareholders.

The company is a joint venture (JV) between Tianqi Lithium Energy Australia Pty Ltd (TLEA) (Tianqi Lithium Corporation/IGO Limited JV) (51%) and Albemarle Corporation (Albemarle) (49%).

TLEA operates the Kwinana refinery, about 220km from Greenbushes, while Albemarle operates the Kemerton refinery, about 100km from Greenbushes too, with both producing lithium hydroxide for export.

The by-product, tantalum concentrate containing tin, is processed by Global Advanced Metals (GAM) located nearby to the Greenbushes operation too.

Greenbushes is recognised as the longest continuously operated mining area in WA, with activities dating back 135 years ago in 1888.

Talison Lithium, along with all its predecessor companies, have been producing lithium from the Greenbushes operation since 1983.

There have been a number of expansions over the past 30 years to maintain its position as a major supplier of lithium mineral concentrates.

In 2017, Talison Lithium began constructing its \$320m second large chemical grade lithium processing plant (CGP2).

It officially opened in 2019 and, this year, construction of a third lithium processing plant commenced.

A tailings re-treatment facility is also in operation at Greenbushes.

Further expansion of production facilities will enable Talison Lithium to supply the downstream processing industry being established in WA by Tianqi Lithium Corporation/IGO Limited JV and Albemarle Corporation.

Talison Lithium chief executive officer Lorry Mignacca says the company is at the forefront of global efforts to address climate change by supplying the lithium needed for the global transition away from fossil fuels to renewable energy.

"As the leading producer of lithium in the world for several decades, and with the ability to increase our production further, we believe that the work we do each day contributes to creating a better tomorrow," he said.

"For several years we have been putting in place the building blocks to increase our lithium production as the world required more supply.

"These building blocks include not only the construction of infrastructure such as additional processing plants and associated facilities, but most importantly out people, who through their dedication and commitment enable us to continue to lead in lithium.

Talison Lithium general manager operations Craig Dawson says the company is a key enabler of the global energy transition.

"The growing demand for lithium needs the support of Talison, a challenge we are embracing through expansion activities at the Greenbushes lithium operation," he said.

"Production of spodumene concentrates from Greenbushes has doubled over the last five years with record production of 1.35mt of spodumene concentrate achieved for the 2022 year."

In CY22, exact production figures include 1,348,616mt of lithium mineral concentrate and 3,188t of tantalum bulk concentrate.

Talison Lithium general manager major projects Matt Timbrell says the company's major projects contribute to a sustainable future at Greenbushes.

"We are excited by many of our construction projects, such as our new accommodation village with its innovative design and sustainability features," he said.

The company is transitioning towards a dual resident/drive-in-drive-out (DIDO) workforce, alleviating the strain on short-stay and permanent housing.

Construction of a purpose-built 500-person permanent village will take place between 2023 and 2024.

Talison Lithium welcomed 303 new employees in 2022 and aims to stay a predominantly residential mine, with one-third DIDO.

Mining and Processing

Mining is traditional drill-and-blast method.

There are four processing plants: one produces technical grade lithium concentrates; two produce chemical grade lithium concentrates; and one re-treating historic tailings.

Ore containing Li_2O is fed into the processing plants which upgrade the lithium mineral, using gravity, heavy media, flotation and magnetic processes, into a range of lithium concentrates for bulk and bagged shipments.

Talison Lithium has its own analytical laboratory, constructed in 1995, providing fast, comprehensive sample analysis of mining,

mineral processing, marketing and environmental samples.

Running 24/7, the laboratory can analyse 400 samples per day and provide approximately 12,000 component analysis results daily.

Exploration and Geology

The current mine life is 20 years and Talison Lithium has an exploration program to replace reserves as they are depleted by mining and to maintain the project life.

The program is focused on identifying and proving additional pegmatites within the mineral leases and exploring the central lode orebody at depth to confirm future underground mining potential.

The Greenbushes pegmatites, belonging to the lithium-caesium-tantalum family, consist of a large main zone over 3km long and up to 300m wide with numerous smaller pegmatite dykes and pods flanking the main body.

The lithium zone is over 2km long and enriched with the lithium-bearing mineral spodumene, which often makes up 50% of the rock.

Study to Recommission Greenbushes-Bunbury Rail Line

Talison Lithium, along with the WA Government, the Southwest Development Commission (SWDC), Arc Infrastructure and Aurizon are in the process of studying the feasibility of recommissioning the Greenbushes to Bunbury railway line.

If recommissioned, the line will transport lithium mineral concentrate in containers from the Greenbushes lithium mine to Bunbury, reducing truck movements along the South-Western Highway.

Talison Lithium has been actively holding local Q&A sessions this August, September and October to provide updates on the study, which remains in introductory or preliminary stages.

In 2019, a similar study by Talison Lithium and the SWDC was undertaken but was placed on hold in 2020 due to the decline in the lithium market and global supply chain disruptions caused by COVID-19.

AMR



The Greenbushes lithium operation is nestled amongst the picturesque region of southwest WA.

MELCHOR CONTRACTING: BECOMING A POWERHOUSE IN THE CIVIL CONSTRUCTION INDUSTRY

In 2017, Melchor Contracting embarked on a journey with a small, dedicated team and limited resources. Fast forward six years, and today, the civil construction company stands tall with a workforce exceeding 350 individuals. It's a testament to their unwavering commitment and relentless effort.

Ryan O'Rourke, Project Manager at Melchor Contracting, fondly reflects on the company's beginnings: "From a modest office in Burswood, we diligently laid the foundation of our culture and set our vision. Six years later, having successfully delivered over 50 projects, we take immense pride in our achievements. We've played a pivotal role in some of Western Australia's most notable civil construction endeavours, fostering meaningful relationships and supporting the communities where we live and work."

In 2017/2018, Melchor Contracting achieved a major milestone by completing the construction of a two-train Lithium Hydroxide Processing Plant in Kwinana. In 2021/2022, they further solidified their expertise by successfully wrapping up up-

stream and downstream Lithium facilities, including a Lithium Concentrator at Mt Holland and another Lithium Hydroxide Processing Plant in Kwinana. Melchor Contracting's proficiency now spans the gamut of construction requirements for both Lithium Mining and Lithium Processing Infrastructures.

Their mining infrastructure portfolio encompasses Primary and Secondary Crushing, Screening Buildings, Fine and Coarse Ore Reclaiming, HPGR, HMS, Regrind and Milling, Fine Flotation, Water Thickener and Water Services, Reagents, Concentrate Handling and Storage, Power and Distribution, and Weighbridge Construction. When it comes to Processing Infrastructure, their expertise extends to Concentrate Storage, Calciner and Acid Roast, Repulp, Spodumene Silo, Ball Mill, Hydromet, Crystallization and Drying, Bagging, Power and Distribution, and Weighbridge.

GREENBUSHES

In 2023, Melchor Contracting expanded its operations to the Southwest Region of Western Australia, where they are currently engaged in the construction of Chemical

Grade Plant 3 (CGP3), an expansion of the Greenbushes Mine.

Greenbushes Mine, the world's largest lithium mining operation, is owned by Talison Lithium, a joint venture between Albemarle Corporation, Tianqi Lithium, and IGO. This colossal operation comprises a vast open-pit mine and four processing plants, with two producing chemical grade Lithium concentrates, one producing technical grade Lithium concentrates, and one re-treating historic tailings to also extract Lithium concentrates, all supported by an intricate infrastructure network.

Working directly for Talison and the EPCM Melchor Contracting manages all aspects of the structural concrete work including but not limited to: supply of plant and equipment, temporary works, supply and installation of reinforcement and cast-in items, detailed earthworks, formwork design and erection, placing and finishing concrete, backfill to finished levels. This monumental project encompasses 145,000 cubic meters of Detailed Earthworks, 15,000 cubic meters of Structural Concrete, and over 3,000 tonnes of Rein-

forcement. Notable highlights include the towering 18-meter Primary Crusher and the impressive 54-meter-long FOS Tunnel. Once completed, Chemical Grade Plant 3 is expected to add 500ktpa of spodumene concentrate to production, solidifying their pivotal role in the lithium industry.

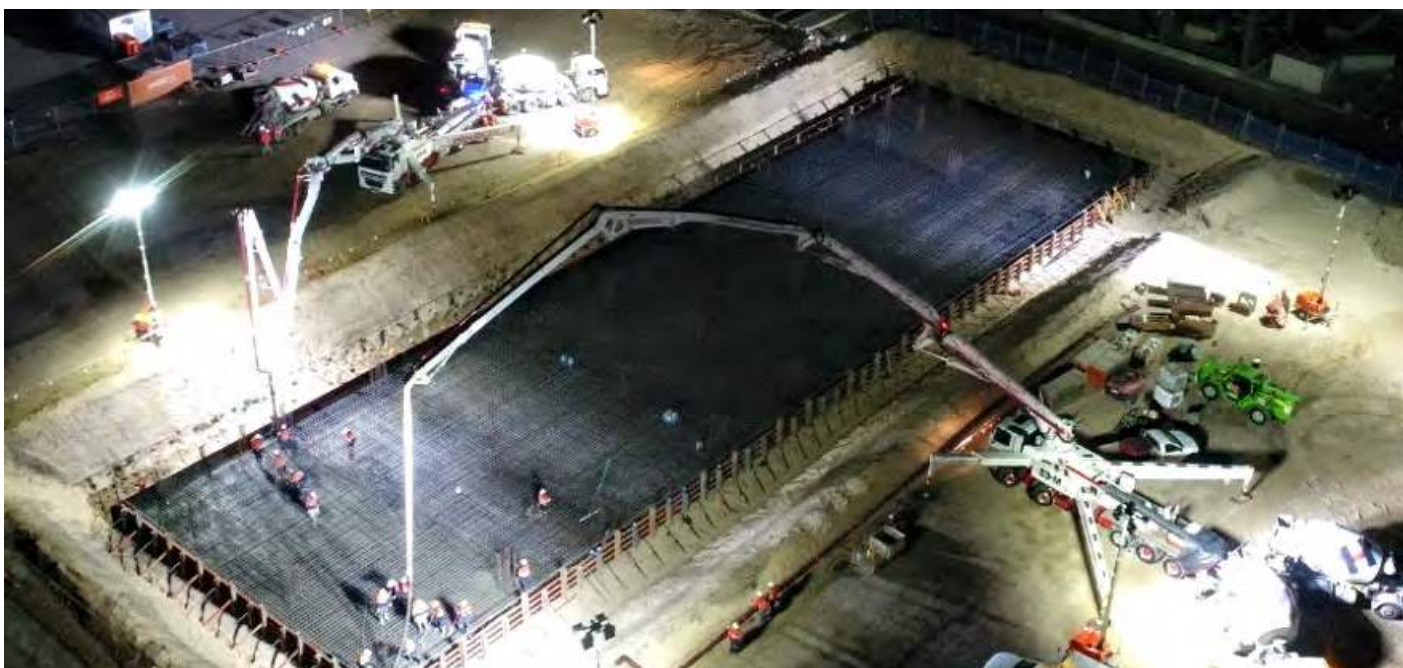
CREATING A SUSTAINABLE AND PROGRESSIVE WORK ENVIRONMENT

Ryan O'Rourke expresses his excitement about the company's future: "Our next growth phase is poised to be a sensational journey. With Melchor Contracting's values and ingrained culture, I firmly believe we will grow stronger as a team."

Community Engagement holds a special place in Melchor Contracting's heart. They recently initiated a sponsorship program for the Bridgetown Bulldogs, a football club local to the Greenbushes Mine. This endeavour reflects their commitment to fostering social inclusion and connectedness within the community, a mission they hold dear.

At Melchor Contracting, Safety is paramount. They prioritise maintaining a safe and healthy work environment for their staff, clients, suppliers, and site visitors. Their collaborative culture enables them to continually manage, review, and implement top-tier workplace safety systems, from ingenious engineering and construction techniques to safety initiatives, awards, and recognition programs. These unwavering commitments to excellence and safety culminated in Melchor Contracting being honoured with the Safety, Excellence & Performance award for Q2 2023 by Talison Lithium.

Melchor Contracting's remarkable journey continues, marked by growth, success, and a profound sense of purpose. If you seek reliable services in head contracts, sub-contracting, or labour hire for your projects, whether you are a project owner, EPC contractor, or Tier-1 civil contractor, Melchor Contracting is available for partnership. **AMR**





Melchor Contracting is a civil construction specialist. We undertake projects of all sizes and complexity across an exciting and diverse range of industries. We have contributed to executing some of the most notable civil construction projects in Perth Metro and remote Western Australia.

We offer end-to-end project delivery encompassing all facets of project design, construction and maintenance. Our expertise in structural concrete enables us to execute end-to-end concrete solutions, including detailed earthworks, reinforcement fixing, formwork, and concrete placement.

In addition to delivering world-class projects, Melchor Contracting is committed to creating a sustainable and progressive work environment for our people, clients, and communities.

In support of the local community surrounding the Greenbushes project, Melchor Contracting commenced sponsorship of the 'Bridgetown Bulldogs' in 2023. The Bridgetown Football Club holds a significant position in the local community, promoting social inclusion and connectedness, and Melchor Contracting takes pride in contributing to the club's positive impact.

MELCHOR

CONTRACTING

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MERC 2023:

PERTH'S MINING EMERGENCY RESPONSE COMPETITION



Serious injuries made up most of the mining lost time injuries (LTIs) in WA in FY21.

A total of 402 out of 458 mining LTIs were classified as serious, with the top five body parts impacted being the hands, back, arms, shoulders and legs.

Some of the incidents that required emergency response teams included an empty haul truck rollover, a steel liner at a processing plant striking and fracturing a worker's leg, as well as a wheel assembly from a drill rig on an underground mine ramp falling and landing on a worker's leg.

Highly-skilled emergency response teams

are crucial in responding appropriately to any life- or asset-threatening incidents on-site, including at nearby mining operations and in the community.

Perth's Langley Park will be host to the 13th annual Mining Emergency Response Competition (MERC) from Friday 24 November to Sunday 26 November.

Last year, over 4000 visitors converged at the same location for the event.

The theme for MERC 2023 is 'Next Generation - Planning for the Future'.

MERC executive committee and founding member Sue Steele says this year's event is going to bigger and better.

"With additional mining emergency response teams, including one international team, 2023 is set to be another great year," she said.

"In line with this theme, we are hosting the next generation of volunteers.

"Junior cadets from regional and metropolitan brigades will be participating in their own emergency response competition.

"Mines rescue teams will take part in a series of skills events featuring future technologies, acknowledging environmental and remote area challenges."

Disciplines assessed at the MERC include: first aid; hazardous materials (HAZMAT); fire fighting; confined space rescue; vertical rescue (rescue from height or depth); road crash rescue; emergency response team readiness (ERT); hazard and risk.

WorkSafe WA acting commissioner Sally North commented on the event.

"The Mining Emergency Response Competition is an excellent opportunity for emergency response teams to test their capabilities in challenging and realistic scenarios," she said.

"The dedication these teams show to their workmates needs to be matched by an industry-wide commitment to make WA's mining industry safer.

"It would be preferable if our mine rescue teams only had to respond to simulated incidents through competitions like MERC rather than full-scale emergencies."

Ms Steele says mining rescue competitions provide an invaluable opportunity for companies from the mining industry to test their skills against industry standards, identify areas of improvement and train their volunteers in a safe and controlled environment.

"The competition assists with improving the scope of learning through skills training and exposure to realistic scenarios performed under the pressure of competition," she said.

"Mine rescue teams must be proficient in the procedures used to rescue miners from various hazards such as fires, explosions, cave-ins, toxic gas, smoke inhalation, vehicle accidents and water."

Mines rescue is particularly dangerous work and rescue crews are usually made up of volunteers who risk their own lives to save their fellow workers.

"Due to the remote location of many mine sites, the site-based emergency response volunteers provide immediate assistance in the case of an incident," Ms Steele said.

"Given their understanding of their workplace and its site-specific hazards this directly assists their ability to save lives."

The MERC journey began in 2010, when the three founding sponsors, Paull & Warner Resources, Red Earth Health Solutions and Bright Group, had the vision of bringing mines rescue to a metropolitan audience.

While the WA Chamber of Minerals and Energy (CMEWA) hosts surface and underground mine emergency response competitions in regional areas, MERC is a Perth-based competition that allows the city population to see the value and importance of emergency response and rescue training in WA's mining industry.

"The city location allows Perth-based industry representatives, FIFO workers, mining families and the local community the opportunity to view firsthand the skills of mining emergency response teams who help to ensure safe workplaces and communities in the event of emergency," Ms Steele said.

"MERC aspires to be the pinnacle event for mining rescue activities.

"We will continue to support, upskill and prepare mines rescue teams and educate industry and the wider community of the importance a well-trained, primed rescue workforce.

"We recognise that the success of MERC is due to the commitment and input from volunteers and sponsors who continue to support this event year after year.

"Without the MERC community there wouldn't be an event and we are sincerely grateful."

MERC 2023 will attract 18 emergency response teams, 150 industry volunteers and more than 4000 members of the public again. **AMR**





EMERGENCY RESPONSE TRAINING FOR A SAFER INDUSTRY



ERGT is Australia's leading provider of safety and emergency response training.

For more than 25 years, ERGT has expanded to facilities across Australia, building a reputation based on exceptional customer service and providing relevant, engaging training that has a real impact on people who live near and work in high-risk workplaces. ERGT is underpinned by a commitment to strong partnerships, experienced people and world-class facilities.

The facilities have been designed to simulate real-life scenarios, with expert trainers

guiding trainees throughout their journey. Through a combination of up-to-date theory and practical exercises, trainees learn how to respond safely and then put that training into action.

ERGT works with industry to develop and adapt courses to meet industry needs. This is evidenced with their new offering of Block 1, 2 and 3 emergency response courses, to better equip emergency response team members in the mining or resource sector.

Covering critical disciplines such as first aid, breathing apparatus usage, and fire

team operations, ERGT's Block courses are the educational cornerstone for a safer industry. The Block courses can be used as a learning pathway to achieve a higher qualification and in partial completion of RII30719 Certificate III in Emergency Response and Rescue.

As part of this commitment to the industry, ERGT is a proud long-term sponsor of the Mining Emergency Response Competition (MERC).

Providing world-class emergency rescue training and skill building opportunities for volunteer mines rescue teams, MERC

is an annual highlight on the calendar for emergency responders. It's also an opportunity to acknowledge the dedication and skill of the hardworking men and women involved in emergency response.

This ongoing commitment to safety is vital, ensuring emergency responders are skilled to act with confidence and effectiveness in critical scenarios, while enhancing safety and reducing risks.

ERGT would like to wish all of the teams participating in this year's MERC the best of luck, your dedication to safety and the industry is invaluable. **AMR**

ERGT AUSTRALIA'S SAFETY
TRAINING SPECIALISTS

YOUR TRUSTED PARTNER IN EMERGENCY RESPONSE

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Talk to the team on **1300 374 828** about your
Emergency Response training requirements.

RTO 2534



SupaFit

SEAT COVERS

AUSTRALIA'S SAFEST

You don't leave anything to chance regarding your mine vehicle; safety is the number one consideration for everything. So what about your seat covers?

If an accident were to occur and the airbags deployed, would your seat cover ensure airbag deployment? If you don't know, then you need to know the difference.

Challenging Safety Standards

This difference is a seat cover that allows in-seat airbags to deploy, effectively and efficiently, without compromise.

When Pete Fenn started his career in Motor Trimming over three decades ago, airbags had only just become a thing, pretty soon, car and truck seat airbags were the Australian standard.

Peter Fenn, Director of SupaFit Seat Covers, commented:

"What struck me then and what's still true today is that there are no Australian standards on car and truck seat covers. Seat covers are going in vehicles that could cause more harm to the occupants (involved in an accident) or simply might prevent the airbags from deploying at all."

Pete made it his mission to find a better way to manufacture seat covers; "It takes longer to blink than deploy an airbag — but any delay means an airbag is less effective. We realised that seat covers weren't being designed to protect lives.

That's why we created SupaSeam™ — to start with safety." Added Pete.



Independently Tested

When tested in the ANCAP testing, the technology has proved it can be relied upon to allow airbags to deploy with the right timing and force — the difference between walking away from an accident with minor injuries or more threatening ones.



SCAN TO FIND OUT THE DIFFERENCE A MILLISECOND'S DELAY IN AIRBAG DEPLOYMENT CAN MAKE.

"For us, it was important that we knew that what we were putting in people's cars

wouldn't impact their safety in any way. Making sure that our covers wouldn't interfere with airbag deployment was our top priority," Peter said.

We wanted to create a seat cover that combines both comfort and safety. We know most people aren't thinking about safety when they're choosing their seat covers.

"We experimented with many different combinations of materials and threads before choosing our materials. It needs to be something that operates correctly in the event of an accident without compromising on a comfortable drive."



Testing, Tweaking and Refining

We needed to create a design that could be adapted to many different types of vehicles. The SupaSeam™ technology is the result of several years of prototyping, testing and tweaks.

"Our seat covers are tested for safe deployment of airbags and the safety of our customers. For us, it was crucial that a SupaFit seat cover could be relied on in the event of an accident," Peter said.



If It's Not Tested and Designed with Safety in Mind, Is It Really Safe?

We're making it our mission to get people thinking about what on-site safety really means.

"We're proud of what we've accomplished with SupaSeam™. There's nothing better than knowing we're helping protect the lives of Australians," Peter said. **AMR**

AUSTRALIA'S SAFEST

SupaFit SEAT COVERS



IF IT'S NOT SUPASEAM™ IS IT REALLY SAFE?

Protecting the lives of Australians with custom seat covers made from Australian materials. They're designed, manufactured, and independently tested in Australia.

- Guaranteed, correct airbag deployment
- Patented SupaSeam™ technology
- Independently tested by APV Tech
- Industry-leading manufacturing process
- Individual Barcode record and tag
- Made with Australian made materials



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SupaFit SEAT COVERS

FENIX RISING FROM THE ASHES

By Ashleigh Melanko

Fenix Resources' (ASX:FEX) flagship Iron Ridge iron ore project is a high grade, high margin project located in the prolific Midwest mining region of WA.

With a JORC 2012 compliant resource of 9.8mt at 64.4% iron, Iron Ridge has some of the highest-grade iron ore in WA.

The iron ore product is high grade with low dangerous elements and is highly sought after by steel mills for environmental and blast furnace productivity reasons.

Following a rapid three-month development period, production began in December 2020 with first sales generated two months later in February 2021.

IRON ORE PRODUCTION MILESTONE

In June 2023, Fenix produced and sold 3m dry metric tonnes (dmt) of iron ore from Iron Ridge with an unaudited net operating margin of around \$52 per dmt shipped.

This significant milestone was achieved 28 months after the first sale of Iron Ridge iron ore in February 2021.



Fenix Resources chairman John Wellborn.

Fenix chairman John Wellborn says the milestone is thanks to the work undertaken by Iron Ridge's team of workers and contractors.

"This milestone evidenced Fenix's consistent profitable production from Iron Ridge, which is the result of excellent work from our hard-working staff and contractors and capabilities as a fully integrated mining, logistics and haulage business," he said.

"This timeline was consistent with Fenix's original feasibility study for Iron Ridge, with Fenix continuing to deliver on its original promise to shareholders in 2019 when it raised \$15m to fund the development of Iron Ridge."

MID-WEST ASSETS ACQUISITION

Fenix boosted its portfolio a month later in July 2023 when it acquired Mount Gibson Iron's (ASX:MGX) mid-west iron ore and port assets. This included the Shine iron ore mine, two on-wharf storage sheds at Geraldton Port, two mid-west rail sidings and assets at the Extension Hill iron ore mine.

The acquisition gives Fenix the opportunity to reduce the cost of production at Iron Ridge, expand production at Iron Ridge, re-commission Shine as a second production asset and benefit from the expected growth in bulk commodity production and export in the Mid-West.

It also allows Fenix to create a substantial new revenue generating business.

"As a result of the transaction, Fenix is now a fully integrated mining, logistics and haulage business in the Midwest, uniquely positioned to benefit from growth expected in the region," Mr Wellborn said.

SINOSTEEL MIDWEST CORPORATION AGREEMENT

Most recently, Fenix secured the exclusive right to mine and export up to 10m dmt of iron ore from the Beebyn-W11 iron ore deposit in the Weld Range, WA.

The deposit is owned by Sinosteel Midwest Corporation, part of the Sinosteel Group which is one of the biggest suppliers of raw materials to Chinese steel mills.

Beebyn-W11 has a resource estimate of around 20mt at a grade of 61.3% and it is located only 20km from Iron Ridge.

Fenix will maintain exclusive control of all mining, hauling, logistics and port operations relating to the mining and export of the iron ore.

Fenix intends to immediately progress the required approvals and expects to begin mining during 2024.

"As we will maintain exclusive sole control of all mining, hauling, logistics and port

operations at Beebyn-W11, we see the potential for significant operational synergies for future mining activity between the Iron Ridge mine and Beebyn-W11," Mr Wellborn said.

The transaction significantly increases Fenix's portfolio of mid-west iron ore project which now includes Iron Ridge, Shine and Beebyn-W11.

PARTNERSHIPS

Fenix's biggest partnership is with MACA, with Australia's largest independent mining contractor providing load and haul, drill and blast and crushing and screening services at the mine.

This contract began in 2020 and runs for six years.

Prior to this, Fenix formed a strategic alliance with trucking and logistics company Newhaul in May 2019, marking a significant step towards the development of Iron Ridge.

Fenix and Newhaul then formed a new joint venture company — known as Fenix Newhaul (FNH) — to provide all trucking services to Iron Ridge.

This includes a brand-new fleet of Volvo and Mack prime movers and trailers purpose-built by WA companies including Bruce Rock Engineering and Howard Porter.

A few years later in June 2022, Fenix signed definitive agreements with Newhaul to acquire Newhaul's 50% interest in Fenix Newhaul, resulting in Fenix holding 100% of the joint company.



Aerial view of Iron Ridge.

Fenix also created an opportunity for indigenous businesses throughout the mine and port operations with the start-up of the Schwarze Brothers.

The team of four brothers from the Wajarri Yamatji community provide material handling services at the port and utilise three Caterpillar 982 next gen loaders.

Currently, Schwarze Brothers supplies ship loading and storage shed management services at the Mid-West Port Authority-owned Geraldton bulk export port.

"This has been a thriving partnership with the brothers, where Fenix has assisted the Schwarze Brothers with their business and professional development, providing financing and training for the team, allowing the business to grow and be profitable until it is ultimately able to operate autonomously," Mr Wellborn said.

"The business has been a huge success operationally and Fenix is proud that this relationship is helping empower and provide financial opportunities for a locally owned, indigenous business." **AMR**



The Shine iron ore mine.

Ship loading iron ore.



A TRUSTED PARTNER TO IRON RIDGE

Located 600km north-northeast of Perth in Western Australia, the Iron Ridge project has crushed and shipped over 1.3mt of high-grade ore since December 2020.

Iron Ridge has a JORC-compliant mineral resource of 10.5mt at 64.2% iron, 3.26% silicon dioxide, 2.57% aluminium oxide and 0.046% phosphorous. Of this resource, more than 95% is in the indicated category.

With high grade and low deleterious material, iron ore from Iron Ridge is highly sought after by steel mills for environmental and blast furnace productivity reasons.

International contracting group MACA was first contacted regarding work for Iron Ridge around four years ago.

"MACA were contacted by Rob Brierly in early 2019. We have worked with Rob previously in the Goldfields," General Manager Brent Jenkins said.

"Their consultant shared the project info with us, and we commenced scheduling and pricing for the project. This relationship continued over the next 18 months with various mine plans and commercial arrangements considered, until the project was awarded in late 2020."

Under this contract, MACA provides load

and haul, drill and blast, and crushing and screening services to Iron Ridge.

MACA is a reputable contractor with a strong track record of operational experience in the mining sector and has been involved in the Australian iron ore industry, having carried out long term work for Atlas Iron and Crossland Resources. A large portion of their revenue comes from iron ore and MACA has completed projects for major mining companies such as BHP, FMG and Roy Hill.

The \$185m contract runs for six years with the potential to undertake further work.

"I understand that there are possible

growth opportunities with the additional resources identified at Iron Ridge and their newly acquired Shire iron ore mine," Brent said.

"Our relationship, performance and contracting expertise will be key to moving forward with Fenix as we continue to build trust and provide flexibility and results for our client. Creating value for all parties is a key differentiator that MACA can continue to build on.

"It [Iron Ridge] has really elevated Fenix from a junior to major miner and logistics business. MACA looks forward to continuing to support and provide services for the growing Fenix business." **AMR**

WORKING WITH BIG NAMES ACROSS AUSTRALIA'S IRON ORE INDUSTRY

MACA is a trusted investment partner, providing equipment and operational expertise to exceed expectations of our customers in the resource and construction sectors for over 20 years.

Currently providing load and haul, drill and blast, and crushing and screening services to Fenix Resources' Iron Ridge project.



MACA INTERQUIP



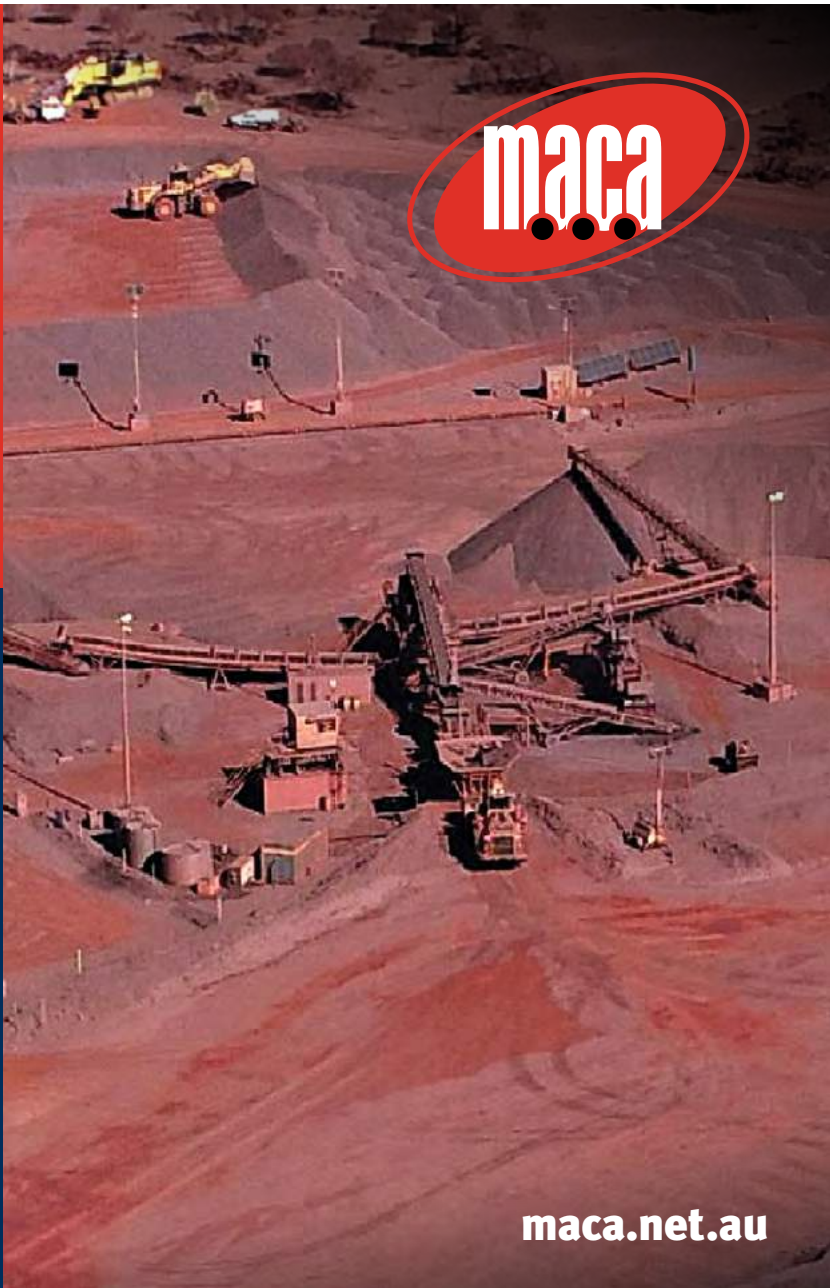
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KALGOORLIE SUPER PIT SET FOR GOLDEN EXPANSION

Around 130 years after the first gold strike was made in Kalgoorlie, the town's most famous tourist spot and one of the world's premier precious metals producers is going through a new lease of life.



(Image source: Northern Star Resources)
The KCGM operations.

Driven by strong gold prices and a seasoned operator in Northern Star Resources (ASX: NST), the Kalgoorlie Super Pit and the Kalgoorlie Consolidated Gold Mines (KCGM) operation is well advanced on a major strategic growth path.

The company recently reported that its financial year 2023 efforts have put it in an enviable position to realise and deliver on its five-year growth strategy through to FY26.

The strategic growth program was developed to generate superior shareholder returns with the target of achieving 2moz of gold production.

The company's growth strategy received a boost in June when Northern Star announced the Final Investment Decision (FID) to expand the Fimiston processing plant.

This will see an increase in throughput from 13mtpa to 27mtpa by FY29 (steady state), while simplifying the plant design and delivering a sustained lower cost base.

Expanding the processing capacity at the Kalgoorlie production centre will strengthen the company's portfolio, materially increase free cash flow generation and sustain hundreds of local jobs, economic and social investment, and local procurement opportunities in the Goldfields region.

Meanwhile, at the Yandal production centre, Northern Star is optimising future ore feed sources for the

expanded Thunderbox processing plant, advancing to delivery of the 6mtpa name plate capacity.

FIMISTON SOUTH

Northern Star is also undertaking a growth project at the KCGM Operations called Fimiston South, which commenced at the southern end of the Fimiston Open (Super Pit) in 2023.

Fimiston South will extend KCGM operations' life of mine to 2034, providing ongoing benefits to the Kalgoorlie-Boulder community and sustaining hundreds of local jobs.

OPEN PIT

The project will consist of two cutbacks, named to celebrate KCGM operations' close connection to the Boulder community and historic links to the Golden Mile.

The 'Great Boulder' cutback will be the single largest cutback at the Fimiston open pit in more than a decade, followed by the 'Ivanhoe' cutback.

Both cutbacks share the names of leases first pegged by Will Brookman and Sam Pearce in 1893 when mining first commenced in the region.

OPERATIONS

To support the project, waste rock will either be redeposited back into the Fimiston open pit or hauled to existing waste rock dumps.

New tailings storage facilities are also planned as part of this project.

During the first 12 months of the project, when mining is close to the surface, there will be instances where open pit blasting will temporarily close a small section of the Goldfields Highway.

Northern Star will work closely with stakeholders throughout this process.

SUPER PIT LOOKOUT ON THE MOVE

As part of the project, the Super Pit Lookout will be relocated. Construction of the new Lookout commenced this year.

One of the most popular attractions in the Goldfields, the Super Pit Lookout draws thousands of locals and tourists each year. The opportunity to view a working mine site in action and the chance of watching a blast keep the Lookout firmly on the local must do list.

The first Super Pit Lookout was a fenced area with a small viewing platform constructed 100m south of the original Hainault Tourist Mine, near the Boulder Block.

Over the years the Lookout has been moved to accommodate the changing pit and is now at the top of Outram Street in Boulder (off the Goldfields Highway, 6.4km south of Hannan Street).

SIGNIFICANT INVESTMENT

To drive that new expansion strategy, Northern Star lifted invested growth capital expenditure of \$752m, which was above revised expectations primarily from KCGM mill expansion early works and procurement of long-lead items, increased capital drilling at Jundee (Yandal) and commercial production being declared later than planned at Otto Bore (Yandal).

The company is already seeing a good return for its investment, with material movement at the Kalgoorlie production centre increasing by 26% to 83mtpa, within the FY26 target of 80-100mtpa.

This material movement is critical to the long-term development of our largest and longest life asset in KCGM.

Meanwhile, the Thunderbox mill expansion project at the Yandal production centre advanced towards delivering its 6mtpa name-plate capacity. Total gold sold at KCGM in FY23 was 432,001oz (FY22: 488,770oz) at an AISC of A\$1,596 (FY22: A\$1,426/oz).

In FY23 gold sales of 1,563koz were delivered within revised guidance at an AISC of A\$1,759/oz.

GOOD GEOLOGY THE KEY

Northern Star has repeatedly noted that the geology at its projects is the basis of its continued growth.

(Image source: Northern Star Resources)
The KCGM operations.

The FY23 exploration program was successful in replacing Mineral Resources and Ore Reserves, as depleted by mining activity.

Group Resources were maintained at 57.4moz and reserves steady at 20.2moz over the 12-month period to 31 March 2023, post depletion.

Northern Star says that maintaining its resource and reserve levels is crucial to achieving the company's five-year strategy to grow production to 2moz per annum by FY26.

The company's strong performance in FY23 saw it achieve three investment grade credit ratings with Moody's, S&P and Fitch, and subsequently in April it was issued US\$600m of senior guaranteed notes due in April 2033 under Rule 144A of the US Securities Act, at an interest rate of 6.125% per annum.

The cash will be used for general corporate purposes including capital expenditure such as funding the KCGM mill expansion.

To progress achievement of its Net Zero Ambition, in FY23 the company's technical teams focused on identifying specific renewable projects for commissioning in FY24, including a Power Purchase Agreement entered into for the Jundee renewable energy project. **AMR**



(Image source: Northern Star Resources)
The KCGM operations.



(Image source: Northern Star Resources)
The KCGM operations.

INDUSTRIAL TOOLING JUST GOT SMARTER

Live testing on heavy machinery carries an inherent safety risk to workers. This is certainly the case in industrial mining operations where maintenance teams need to maximise equipment uptime, while conducting routine maintenance more efficiently.

Fortunately, SafeGauge's range of SafeTest tools are designed with safety and efficiency in mind.

The Australian-owned company adopts an innovative focus to manufacture quality technology used in live testing heavy mobile plant machinery in the mining, construction, oil and gas, defence and agriculture industries.

As a heavy plant mechanic by trade, and experience in testing machinery in mines, SafeGauge founder Luke Dawson observed that workers were regularly exposed to the risk of severe or even fatal injuries when undertaking routine pressure testing of hydraulic equipment.

This encouraged him to develop safer, remote wireless testing products to help eliminate live testing on site, which led to the creation of SafeGauge.

"Our goal is to Eliminate Live Work, minimising the chance of crush and fluid injection injuries, whilst actually improving the efficiency, contrary to many other safety products" said Dawson.

"We've developed a unique range of wireless tooling that allow workers to perform the same testing they usually would on heavy machinery, but from a safe distance. Designed to deliver the safest, most efficient way to complete a wide range of mobile plant maintenance tasks."

The multi-award winning SafeTest range including Pressure Transducers, Dial Indicators and Tachometers are the only solutions suitable for heavy industrial applications. Connect multiple SafeTest products simultaneously to the Wireless MultiTool

to display live readings from up to 50m (164ft) away.

SafeGauge is launching its latest breakthrough in heavy-vehicle maintenance technology – The MultiTool Pro.

"The MultiTool Pro is a game changer for the industry, taking safety, and Elimination of Live Work into the digital age," says Dawson.

The new tool can connect up to 12 SafeGauge wireless tools (measuring pressure, temperature, speed and movement/wear) with added data-logging and reporting capabilities. It allows maintenance crews to not just perform the testing, but accurately log and report readings across routine and breakdown maintenance tasks.

Reports can be generated and exported to enhance troubleshooting and data analysis using either the interactive graph or digital view. There's also the ability to

customise a template for each machine and task, simplifying the setup process. Reports can be downloaded, shared locally or via email, straight from the device, facilitating collaboration across teams. The MultiTool Pro is designed with remote monitoring and diagnosis in mind, giving technicians access to the data they need, without risking safety.

Whether it's haul trucks, excavators, dozers, drill rigs, graders or loaders, the SafeTest product range keeps maintenance workers clear of crush zones and outside the 'line of fire' during live testing. With safety a top priority in the mining industry, SafeTest tools are a genuine stand-out to help sites improve safety, reduce downtime, while optimising productivity in the maintenance sheds.

The MultiTool Pro can be pre-ordered now for the December 2023 release.

For more information, visit www.safegauge.com.au

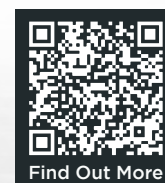
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REVOLUTIONISE YOUR EQUIPMENT WITH SYNCHRA MAGNETIC COUPLINGS!

Maximise Torque, Minimise Maintenance - Experience the Synchra Advantage



Are you searching for the next generation of engineered solutions? Discover Synchra, the cutting-edge magnetic coupling system from MagnaDrive, delivering unmatched performance and longevity. Synchra offers a no-contact, magnet-to-magnet synchronous connection, transforming your equipment operation with zero RPMs lost.

Why Choose Synchra Magnetic Couplings?

- 1. Unmatched Performance:** Synchra Series maximises torque and eliminates magnetic slip, ensuring consistent performance for vital equipment, even in the most demanding applications.
- 2. Compact & Durable:** Using the world's strongest permanent neodymium-iron-boron magnets, Synchra couplings are lighter and more compact than traditional magnet-to-copper couplings. This results in superior performance and greater flexibility for high-speed applications.
- 3. Lifetime Operation:** Say goodbye to frequent component changes

and operational shutdowns for maintenance. Synchra is designed for a lifetime of dependable operation, saving you time and money.

Key Features of Synchra:

- **No Physical Connection:** Enjoy a completely no-contact solution between your motor and load.
- **Up to 80% Vibration Reduction:** Achieve smoother, more efficient operations.
- **Misalignment Tolerance:** With a tolerance of up to 6mm, Synchra handles challenging setups with ease.
- **No RPM Slip:** Synchronous RPM transfer ensures precision and reliability.
- **Over Torque Protection:** Safeguard your critical equipment with reliable over-torque protection.
- **Automatic Reset:** For added peace of mind and convenience.
- **Compact Design:** Save space while enhancing your equipment's efficiency.
- **Zero Maintenance:** Eliminate the

headache of regular maintenance.

- **Vibration Reduction:** Significantly reduce vibration transfer between motor and load.
- **Lowest Total Cost of Ownership:** Reduced maintenance costs and increased longevity.
- **Accepts Significant Misalignment:** Ideal for demanding industrial applications.
- **Simple Installation & Operation:** Get started with ease.
- **Increased Seal and Bearing Life:** Synchra enhances the lifespan of your components.

The Synchra Lineup: Choose from a range of Synchra models, from Synchra-200 to Synchra-700, each tailored to varying torque, motor RPM limits, and kW ratings. Find the perfect fit for your specific needs.

- **Synchra-200:** Torque: 200 | Motor RPM Limit: 3000 | kW Rating: 22kW at 1500 RPM and 37kW at 3000 RPM.
- **Synchra-700:** Torque: 8307 | Motor RPM Limit: 1500 | kW Rating: 1000kW at 1500 RPM.

Ideal for Multiple Industries: Synchra is the go-to choice for industries subject to:

- Moderate to severe misalignment
- Load seizures
- Pulsating loads
- Thermal expansion
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Contact Us Today. Ready to transform your engineering projects with Synchra Magnetic Couplings? Contact us today for a free consultation and discover how Synchra can revolutionize your operations.

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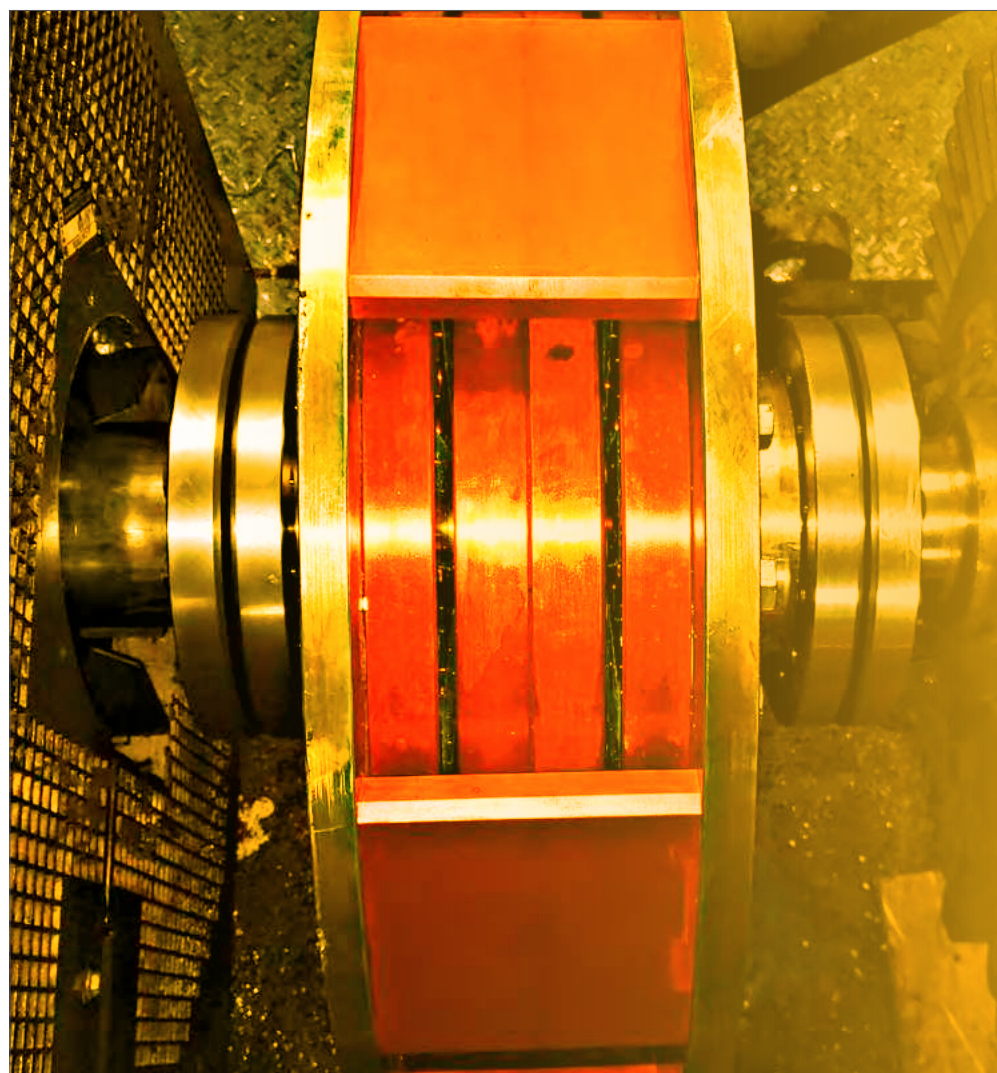
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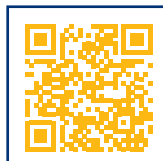


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ENHANCE YOUR CONVEYOR SYSTEMS WITH MC CONVEYOR CLUTCH!

Efficient, Reliable, and Environmentally Friendly Conveyor Starting Solutions.



When it comes to conveyor systems, smooth and controlled starts are crucial for maintaining efficiency and minimising wear and tear. Introducing the MC Conveyor Clutch by MagnaDrive - the latest innovation in conveyor technology designed to provide precisely that.

Why Choose MC Conveyor Clutch?

- 1. Controlled Soft Starts:** The MC Conveyor Clutch offers a controlled soft start, reducing mechanical stresses on your conveyor system, effectively preventing costly belt damage.
- 2. Reduced Energy Consumption:** Enjoy reduced energy consumption as motors can fully start unloaded, contributing to cost savings and extending motor life.
- 3. Simple Installation:** Say goodbye to complex installations and expensive scoop and fluid couplings. The MC Conveyor Clutch is easy to install, saving you time and resources.

MC Clutch Features:

- Fully Adjustable Torque Control:** Tailor the start-up to your exact requirements, ensuring smooth and efficient operations.
- Closed-Loop Feedback:** Benefit from precise control with 4-20 mA signal closed-loop feedback.
- High Efficiency:** Achieve an impressive 98% efficiency, optimising energy usage.
- High Inertia Starting:** Handle even the toughest starting loads with ease.
- Vibration Elimination:** The MC Conveyor Clutch eliminates vibration from misalignment, extending the lifespan of your conveyor system.
- Optimised Cooling:** Allow motors to operate at full speed for more effective cooling.
- Simplified Power Requirements:** Operate with only single-phase electric power and control signals to the actuator.
- Harmonic Elimination:** Say goodbye to harmful electronic harmonics, ensuring a cleaner power supply.

- Low Maintenance:** Virtually no maintenance required, reducing downtime and costs.
- Environmentally Friendly:** With no fluids, oils, or chemicals, the MC Conveyor Clutch is environmentally responsible.
- Durable Construction:** Built with corrosive-resistant materials, coatings, and durable electroplating, it's reliable in demanding and dirty environments, indoors or outdoors.

The MC Clutch Lineup: Choose from a range of MC Clutch models, from MC-500 to MC-1000, each offering varying torque, motor RPM limits, and hp ratings. Find the perfect fit for your specific conveyor needs.

- MC-500:** Torque: 2974 | Motor RPM Limit: 1800 | hp Rating: 500.
- MC-1000:** Torque: 5948 | Motor RPM Limit: 1800 | hp Rating: 1000.

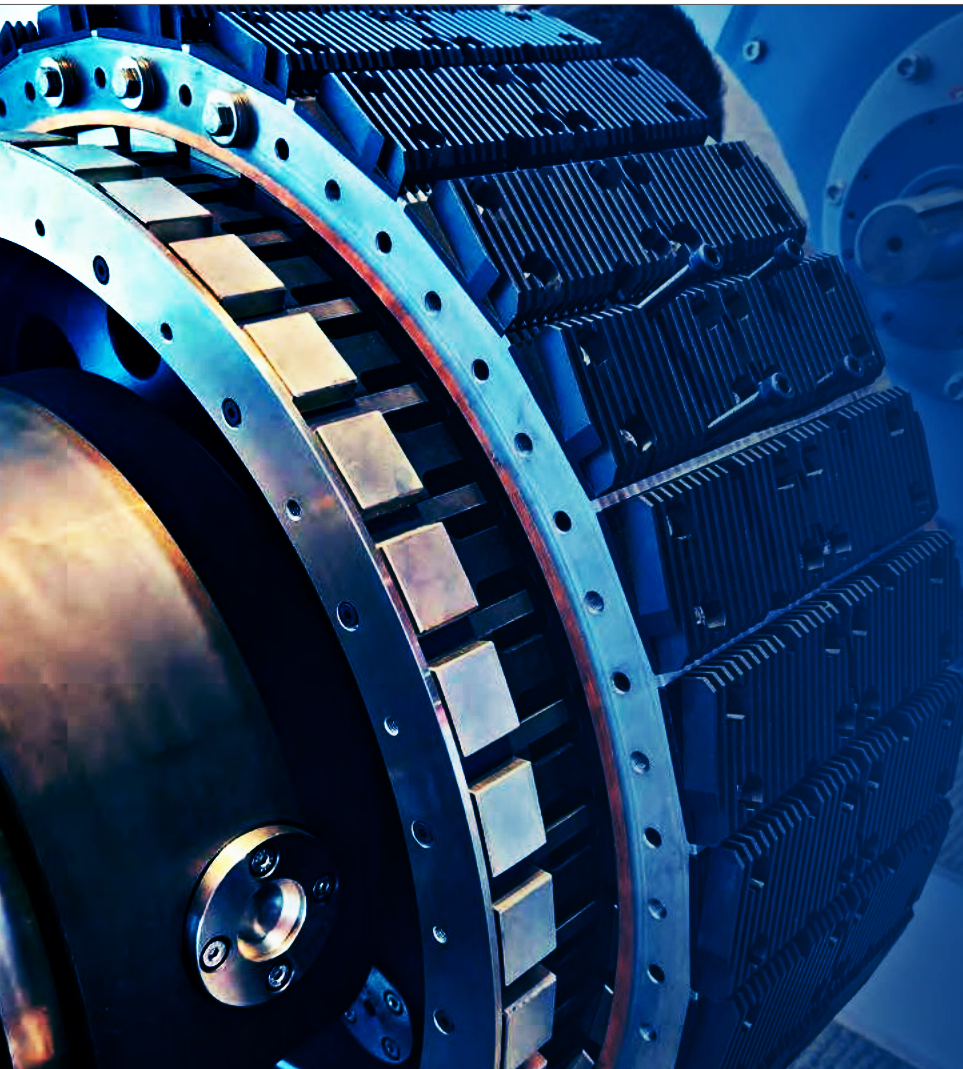
Contact Us Today. Ready to optimise your conveyor systems with MC Conveyor

Clutch? Contact us today for a free consultation and discover how the MC Conveyor Clutch can elevate your conveyor performance.

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Upgrade your conveyor starting solutions to boost efficiency, reliability, and sustainability with MC Conveyor Clutch from MagnaDrive!

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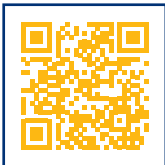
The Latest Innovation in Conveyor Technology

Eliminate belt damage and experience smooth and controlled starts with MC Conveyor Clutch.

MC Conveyor Clutch features reduced energy consumption and controlled soft starts, plus it's easy to install.



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CHEMICAL & PROCESS TANKS ARE COVERED BY POLYMASTER

Since 1994, Polymaster has been manufacturing a diverse range of Australian-made storage products for multiple industries, including mining, agriculture, food and beverage, chemical and water.

For almost 30 years, Polymaster has been at the forefront of the industry by designing and manufacturing industry-endorsed and product-certified solutions, and for the last decade they have specialised in the industrial space.

Their extensive range of products includes chemical and process tanks, bulk diesel tanks, rainwater tanks, liquid fertiliser storage tanks, septic tanks and animal care products.

With a lot of water used in the mining industry, this is a big sector for Polymaster.

"There's quite a lot we do in mines, from Water Treatment to Chemical Dosing. When you dig, say a tunnel, you will most likely come across water. You can't dump this water due to heavy metal contamination. The water (and soil) needs to be treated before being released," National Key Account Manager Jason Egan said.

"Mining can also be quite water intensive during the washing and separation process due to the large number of byproducts that come out of a mine. There is also a large amount of chemical stored on site that is used to treat this water and to assist the separation process."



Tank Range

Polymaster tanks range from small dosing tanks of 110ltrs up to largest rotomolded tank in the southern hemisphere - 50kl. Their tanks can store a virtually all liquids including, water, chemicals, diesel and lubricants/oils.

Water & Process Tanks

The water and process tank range comprises of round rainwater tanks, slimline tanks and pumps, underground water tanks, retention and detention tanks, and process tanks.

For the mining sector these process tanks are designed to suit many applications, such as backwash and brine tanks through to aeration tanks which have unique designed internal pipework that facilitate water treatment.

These tanks are built to last in Australia's harsh outback climate and come with a 25yr design life due to their unique UV protection. This range goes from 600ltrs up to 50kl.

Chemical Storage

Polymaster understands chemicals and undertakes a chemical compatibility test before every project. Some aggressive chemicals can't be stored in just an ordinary rainwater tank. The plastic (polyethylene) needs to be matched to the chemical being stored so that it doesn't adversely affect the tank.

Polymaster has developed over its long history a PE formula that suits these 'aggressive' chemicals, such as Ammonium Nitrate, Magnesium Sulphate, Nitric Acid, Sodium Hypochlorite and Sulphuric Acid (30%+ concentration) to name a few.

Due to the risk associated in holding these chemicals, chemical storage solutions are typically all about compliance, standards, regulations and occupational health and safety issues.

"Our double-walled chemical tank range goes from 1500ltr through to 30kl. These are self-bunded which means there's a tank inside-a-tank so that it creates its own bund. No need to build a concrete bund," Jason said.

"There's a significant cost saving by not having to build a secondary piece of concrete infrastructure for the tank. The Polymaster self-bunded tank meets Australian Standard - AS3780."

These tanks are also kitted out with appropriate pumps to move the chemicals around site safely, whether you require precise dosing or compatible transfer pumps, which are all housed within a weather-proof cabinet.

Sludge Clarification Tanks

Polymaster cone bottom tanks suit many applications including soil remediation, chemical mixing and sludge clarification processes. Like all Polymaster tanks they are one-piece construction with no seams or joints.

They are built with what is being stored inside in mind and are available in both a 1SG and 1.5SG (density) from 600ltrs to the massive 30kl tank.

The 50° cone design reduces the chance for viscous liquids to build up inside the tank, allowing for easier drainage and take-off.

"We have a range of sludge tanks that act as a clarifier. The idea of a clarifier is that you can dump in dirty water and pullout clean water and ultimately recycle some of the water back through the process again. There's some recycling going on within the water," Jason said.

"Over the years, we've been called upon to build some really interesting clarification and aeration units, as our factory is set up for custom designs."

Diesel & Oil Tanks

Polymaster's range of diesel bulk storage tanks are designed and built to last and are available in single or double walled options.

"On mine sites, we're seeing more of our tanks being used in the workshops to store coolants and oils. As a mine expands or moves over time, our tanks can

be relocated easily due to their design and their robustness," Jason said.

The diesel range includes portable ute packs (200ltrs to 800ltrs), transfer tanks with pumps (1200ltrs to 300ltrs), mobile trailers (1200ltrs & 2000ltrs) and bulk diesel storage up to 10kl.

The Polymaster Difference

What sets Polymaster apart from others in the field is its self-bunded tanks and the way they go about business.

"The self-bunded range is quite unique to us in that we have a very large range and that we provide 'plug&play' solutions to our customers," Jason said.

"These self-bunded tanks are becoming more and more of a go-to standard for a self-bunded tank across the country now."

"Companies are wanting more of a complete solution from a manufacturer, and not just a tank by itself. There is a lot involved with plumping up tank to various dosing pumps to ensure all the lines, valves and seals are compatible, so it makes sense to have an OEM manufacturer like us to do this inhouse and deliver it to site ready-to-go," Jason said.

Polymaster is always launching new products and their engineering department works on all aspects of how to make the tanks fit-for-purpose every time.

"Our tanks are designed using FEA modelling techniques which is unique to our industry. By FEA modelling a tank design, we can determine where we need strength in the wall, floor and roof. Knowing this ensures we build a tank that will be safe and will last," Jason said.

"Because of our chemical compatibility process, every time we kick off a project, we'll ask 'what are you storing?' to make sure the tank suits the desired application. Understanding what they are trying to achieve can confirm their design as can offer some direction based on our experience."

For more information, visit
www.polymaster.com.au or
email sales@polymaster.com.au.

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IMS have added the new BP1200-48TB track electric twin power blender to its impressive collection of blenders and pugmills, the new BP1200-48TB has four separate feed hopper each five meters long holding 12m³ each. All feed hopper conveyors are fitted with belt scales and controlled by a PLC control and recording system that can be operated from an iPad or phone from its own Wi-Fi system from a loader or site office. A Cat C7 Generator powers the Nord electric motors all fitted with invertors offering variable speed to each feed hopper conveyor. The generator can be connected to mains power and could power an extra 24-meter radial stacker increasing the stockpile capacity.



A new IMS-PM1200-20TB Track Pugmill with twin 10m³ feed hoppers has just commissioned to Braeside Quarry on the New England Highway Warrick in Qld, the options the PM1200-20TB offered Braeside improved product management with the twin feed hoppers blending fines into roadbase to make spec or having two different products available ready for moisture control and CTB. The PLC control and recording system can be operated from an iPad in a loader managing all aspects of the operation including loading trucks and multiple trailers stopping when the required weight has been reached for each unit and recording the ID number of each load.



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Crusher & Screen Sales Pty Ltd (CSSH) are the Australian distributors for IMS from Ireland who manufacture a range of plant including mobile and modular high production pugmills and blenders offering up to four full size feed hoppers, two powders and liquids fully PLC automated from an iPad.



IMS – PM1050-16TB Track Pugmill with adding Powder and liquids options, fully automated with production of up to 500 tonnes per hour.



IMS – BP1200-9TB Track Blender with two 5.5 meter long feed hoppers with mixer and production up to 1000 tonnes per hour.



IMS electric modular Pugmill & twin hopper Blender with and 24-meter radial conveyor with auto radial return and auto lift as the stockpile height increases, fully automated and in stock. Option of four hoppers.



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SMARTTECH DOMINATING AUSTRALIA'S CIVIL AND MINING SECTORS



Sales Manager Craig Foster.

Beginning with just four employees in 2017, SmartTech has grown substantially to provide its services all over the country. Servicing Australia's civil and mining sectors, SmartTech's personnel possess the vast experience to call on the industrial sector.

Sales manager Craig Foster spoke of SmartTech's growth and its presence in the country.

"We've got a very large support fleet of equipment and personnel. WA is the largest branch as far as support capability. In WA we've got nine trained technicians, four service trucks which are prime movers and two more on order," he said.

"Nationally, we have 17 service trucks across 13 locations.

"In WA, we have a base where we store trucks and vehicles and equipment, this is in the Goldfields and in the Pilbara as well as Perth."

Remote Work

Servicing mining companies all over Aus-

tralia, SmartTech is no stranger working in remote areas.

"We have mining companies on the WA — South Australia border, same with the Northern Territory — WA border and all the way down to Esperance and everywhere in between," Craig said.

"It's a big state and a big struggle, but that's why we've got so much equipment and so many people.

"With the more remote sites, the guys are very isolated because you're really only going there for them. We do our best to dedicate some special time for them each year on recalibrations and stuff."

Loadrite

A scale system for client's assets, Loadrite scales are the highest quality on-board weighing system in the market. It dramatically increases production, improves accuracy and lowers operating costs.

Loadrite has been around since the inception of SmartTech and is a core pillar of the company.

All scales need to be recalibrated and SmartTech schedules over 1000 recalibrations per year, in WA alone.

"Basically, it [Loadrite] gives them productivity and visibility. We combine it with software, we've got numerous software that they can utilise," Craig said.

"They [the clients] use it for both safety reasons and for productivity reasons. They can get a clear weight of what the equipment is picking up."

Loadrite scales can be added to a range of machines, including excavators, haul trucks, loaders, conveyor belts, tractors and f-lifts.

With the Loadrite Material Management

System (MMS) installed on your computer, you can turn the Loadrite onboard scale into a business management tool. The recorded information can be used for inventory management, product tracking and identifying bottlenecks in the operation.

Improve your waste operation and report accurate information with the Trimble LOADRITE E2750 weighing system that gives you the information to increase efficiency and maximise profits.

By tracking the weight of each bin, customers receive accurate weights which helps their environmental reporting and helps reduce their carbon footprint by increasing their recycling rate. For over 20 years, metal mining services company MLG Oz has been using Loadrite with over 100 loaders all running on the Loadrite system.

"MLG have been using the Loadrite system for over 20 years and find it a very reliable and accurate weighing system," managing director Murray Leahy said.

"The Loadrite system is a very accurate and reliable system, the backup support provided by SmartTech has been excellent.

"MLG look forward to dealing with SmartTech into the future."

Growth

With a plethora of solutions, SmartTech will start promoting these to market a bit more now.

"We've got a large safety suite, which is one of the areas that is obviously getting a lot of news at the moment," Craig said.

"It's good to show the market what we've got to make sure they're covering all their statutory requirements in the safety field."

For more information on Loadrite, visit www.smarttechaustralia.com.au

AMR



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ENHANCING DRILLING EFFICIENCY AND PRODUCTIVITY WITH TRIMBLE GROUNDWORKS

In the dynamic world of mining, staying efficient and competitive is paramount. Trimble Groundworks, supplied through SITECH WA, has emerged as a game-changer for mining companies in Western Australia. This advanced machine guidance technology is transforming the way drill rig operations are conducted, offering a range of benefits that significantly enhance efficiency, productivity, safety, and profitability on mine sites.

Trimble Groundworks combines state-of-the-art hardware and software to provide real-time guidance and control to equipment operators. Accurate drilling is crucial for tasks such as overburden removal and ore extraction. Trimble Groundworks ensures that drill rigs can consistently perform with millimetre-level precision, minimising waste, reducing the risk of over-excavation, and optimising ore recovery.

The technology aids in drill and blast operations by ensuring drill rigs are accurately positioned with the correct drill depth, direction and drill hole calculation from any

direction. The platform's "Auto-Stop" feature eliminates over and under drilling so operators can drill exactly to the required depth every time. The increased precision helps in creating more predictable blast patterns and improving fragmentation, and reduces the need for secondary blasting which ultimately leads to safer and more efficient blasting operations.

By minimising over and under drilling, Trimble Groundworks helps mining companies to adhere to environmental regulations and reduce the environmental impact of mining activities due to lower fuel consumption, a critical concern in today's mining industry. The reduction in rework also leads to cost savings from faster project completion and less wear and tear on equipment.

Trimble Groundworks offers automation capabilities that allow for semi-autonomous or autonomous machine operation to improve the overall safety of equipment operators and other personnel. Accurate machine control allows the equip-

ment to operate continuously, reducing operator fatigue and minimising the risk of accidents and collisions on the mine site. Avoidance zones alert the operator of areas to avoid, helping to reduce blind spots and eliminating the need for people standing near the machine. A safer work environment allows for uninterrupted operations, contributing to increased productivity.

Mining companies in Western Australia often operate in challenging terrains. Trimble Groundworks can import and execute pit designs directly, ensuring that all activities adhere to the planned contours and slopes. Groundworks provides real-time data on machine performance, site conditions, and material quantities, which also allows operators to create in-field designs or reports onsite without the delays of returning to the office. This information can be used for immediate and better-informed decision-making and planning. This feature is particularly valuable in open-pit mining to enhance overall efficiency.

Trimble Groundworks is a powerful tool that is helping mine sites improve efficiency and productivity in various aspects of their operations.

Its ability to provide real-time guidance, optimise processes, enhance safety, and facilitate data-driven decision-making makes it a valuable asset for companies looking to maximise their output while minimising costs and environmental impact.

Innovative technology like Trimble Groundworks is likely to remain a top contributor towards continuing the success and sustainability of the mining industry.

SITECH WA is the authorised provider of Trimble Groundworks in Western Australia, and offers a range of advanced technology solutions for the mining industry.

To learn more about their range of technology solutions, contact
sales@sitechwa.com.au or
call (08) 9392 7700.

AMR

STAY ON TARGET FOR MORE PROFIT.



- Real-time data and precision positioning to enhance productivity and reduce over or under drilling.
- Reduce emissions with less rework and less fuel consumption.
- Increase safety with reduced people-to-machine interactions.



www.sitechwa.com.au

1/8 HASLER ROAD
OSBORNE PARK, WA, 6017
(08) 9392 7700
SALES@SITECHWA.COM.AU



THE WEATHER INTELLIGENCE ADVANTAGE IN THE MINING INDUSTRY

weatherzone^o
business
a DTN company

As the past few years have shown, the weather has a pivotal influence on and is a growing challenge for safe, effective mine site operations. It's clear that extreme weather conditions are increasingly becoming a risk to safety and profits, and long-term outlooks predict more unprecedented conditions in the years to come. To reduce the operational losses, asset damage, and safety risks caused by weather impacts, accurate situational awareness and environmental monitoring are essential for allowing sufficient time to plan and respond effectively.

Flooding impacts ground stability, increasing the risk of slope failure and the overtopping of tailings dams. Drought affects the water supply, with high temperatures endangering worker health and production. Lightning poses the threat of fatality for personnel and damage to assets, as well as increases site shutdowns. Rain and wind impact blasting operations, with blast plumes potentially harming both teams on-site and the communities surrounding mine sites. Key work schedules and machinery maintenance must occur when conditions are optimal to improve efficiency and minimise profit loss. These are just a few of the ever-present risks that can be closely monitored and potentially reduced when you harness the power of weather intelligence.

Mining operations must prepare for weather-related risks

We have reached a point where historical weather events no longer provide an adequate yardstick for what may occur in the future. This uncertainty must be taken into consideration when assessing your operation's resiliency to climate extremes. Our weather intelligence supports your proactivity, enabling you to pinpoint potential meteorological causes for major revenue loss and environmental and safety risks, gradually moving to prevent and protect. It's also foundational when planning and designing mines, infrastructure and acquiring assets. Now is the best time to identify the weather extremes related to your site and focus on preparation, utilising insightful analytics to mitigate risk where possible.

Forecasting solutions for the short and long term

Weatherzone Business, a DTN company,

has worked closely with the mining industry to identify its greatest weather challenges and addresses them with innovative monitoring, forecasting, and alerting solutions. The [Miningzone](#) interface centralises all these services. Deployed at over 400 mining companies globally, it delivers accurate data and actionable insights to improve safety, efficiency, and planning. Access to Miningzone provides a detailed analysis that allows you to begin putting in safeguards to reduce the impacts of severe weather on-site. Plan to improve your water security, safeguard your site against the threat of fire and flood, and evaluate your current evacuation and operation procedures. Understanding the nuances of your exact location, and the variability of conditions as the climate shifts, allows you to be proactive with your risk management to protect your profits.

Short-term forecasting, such as the operational forecasting system, is built on your specific data and procedural requirements. This valuable decision-making tool enables operators to visualise and respond to any weather threat to your operations in real time and up to seven days out. This delivers a major advantage when scheduling crew work and maintenance. Forecasts are presented using simple green, yellow, and red coding, providing instant recognition when thresholds are likely to be breached.

The forecasts are coupled with commentary from our [Risk Communicator](#) meteorologists, customised to your site and operations, giving you detailed intelligence to drive your decisions. You can view weekly forecasts, 12-hour blocks, or drill down to a one-hour resolution. The data updates every 10 minutes, supporting a quick response and adapting to changes in the field conditions.

Using a centralised interface to underpin operational efficiency

Miningzone is a password and IP-protected control centre. Its suite of industry-specific solutions includes but is not limited to, alerting, [hyperlocal forecasting](#), [severe weather monitoring](#), [lightning detection](#), and [blast dispersion modelling](#). All the solutions are entirely customisable to the unique site, operations, and parameters of your mine. Personnel with access can instantly visualise the critical data they

need to make informed operational decisions via their personal device or any device within the network. Miningzone's ability to streamline the communication of data across large teams — including monitoring and alerting of severe weather systems — underscores both safety and operational efficiency. When everyone has precise alerting based on their location, they can quickly take personal responsibility for their safety. Full situational awareness and access to comprehensive data are essential to support operational decisions. The Miningzone interface delivers vital weather insights and environmental intelligence. This actionable information drives confident and informed decisions, improving the flow and efficacy of operations and ensuring everyone has real-time awareness.

Stemming the tide on flood risk for your mining operations

The last two years have shown us the enormous cost of La Niña's higher-than-average rainfall, specifically for the mining industry in eastern Australia. If your mine is vulnerable to flooding, you can utilise the Weatherzone Business Rainfall Risk System to monitor rainfall across any number of geofenced culverts or site sections. The technology creates hundreds of virtual weather stations for each chosen catchment, enabling precise determination of both rainfall intensity and accumulation. Alerts are raised when thresholds for any section are approaching or have breached thresholds, giving you targeted visibility of flood risk to inform your operational response. Real-time alerts are sent by SMS, email, and our industry app [WeatherGuard](#), providing immediate situational awareness for all personnel out on the site. Rainfall data can be supplied to a third-party solution to integrate hydrology and culvert alerts for your site; this is particularly useful in elevating environmental risk visibility. The Rainfall Risk System easily integrates into the Miningzone interface.

The advantages of utilising customised mining weather intelligence insights

Every mining site worldwide has its own distinct operational scope, environmental landscape, vulnerabilities, and challenges. Therefore, trying to apply generic forecasting systems to a site with its own complex and unique needs is a financial and safety

risk. Taking your weather monitoring and management to another level with completely tailored solutions is imperative. Providing another advantage, DTN offers [meteorological modelling and consultancy services](#) that deliver targeted guidance to ensure no stone is left unturned when identifying how weather affects your business and how to transform your approach to these challenges. Our meteorologists monitor your site 365 days a year, tailoring meteorological briefings, risk forecasts, and analytics for incoming weather events and their likely impacts. You can reduce unnecessary downtime and concentrate on your work schedules, knowing you will be alerted if threatening weather conditions are on the horizon. And when they come, you have expert advice tailored entirely to your site and scope guiding your planning, preparation, and response.

A multi-faceted approach to improving safety and efficiency every day

The advantages of innovative and easy-to-visualise weather intelligence are substantial. The capacity to identify adverse conditions well before they hit improves your response. Ensuring every member of your team knows when they are personally at risk on-site due to accurate severe weather alerting enables them to keep themselves and your assets out of harm's way. Having foresight about what kind of extreme weather or conditions you can expect over the year ahead means you can prepare effectively and reduce profit loss.

If you want to safeguard your mine, a multi-faceted approach will give you the advantage. We are here to support your operational efficiency and site safety and help protect your bottom line. If you have a complex weather challenge — whatever the season — we will work hard to solve it and provide [effective solutions](#). As you move to improve your mine's resiliency and everyday operations, we are ready to help strengthen your response.

Discover our comprehensive suite of [mining solutions](#), tailored to your site and operational scope. **AMR**

GETTING TO KNOW INDUCTION BEND MANUFACTURER: INDUCTABEND



Australia's premier induction bend manufacturer Inductabend specialises in high integrity heat induction bending of pipe and other sections for gas pipelines, mining and construction. Generally, if it can't be cold bent, it can be induction formed.

Founded in 1992 by Barry Crouch and Rob Stead, the business has been servicing the mining, oil and gas and building industries in Australia for over 30 years.

Its founders both had extensive experience in manufacturing and engineering, with Barry having previously worked as an engineer for the SEC and Rob owning and operating several manufacturing businesses.

Their first experience working together was running Smithweld, a specialist cold rolling and bending company.

After a few years cold rolling, the opportunity to purchase an induction bending machine, originally brought into Australia to assist with the construction of coal fired power plants, presented itself and thus Inductabend was born.

As managing director, Barry has been involved in the day-to-day operations of Inductabend from the beginning. He and other long serving employees including general manager John Rea contribute to the wealth of experience and knowledge Inductabend has at its disposal to aid its customers in ensuring their bends are made to fit their purpose.

Presently, the business is entering a transitory phase with the directors committing to the long-term future of the business in Australia. This is being done through investing in, updating and upgrading its plant and equipment, as well as continuous investment in research and development of new cutting-edge induction bending (and heat treatment) technologies.

New management is also being implemented with the introduction of Nathan and Jordan Crouch into the business. Both are experienced professionals with backgrounds in civil engineering (utilities water and gas), finance and accounting.

What Is Induction Bending?

Induction bending is a hot bending process specifically designed to produce high

quality pipe bends with mechanical properties equivalent to or exceeding those possessed by the mother pipe the bend it's produced from.

Inductabend has continued to develop and improve its capabilities, product offerings and overall quality as the core value adding proposition for Australia's industrial markets.

"We work with our customers to tailor bend geometries and mechanical characteristics to their needs. In order to ensure consistent performance of our bends we employ a wide range of destructive and non-destructive testing methods to create custom testing programs tailored to our client's pipeline application and risk profile".

Products

Inductabend owns and operates three induction bending machines that cover a wide range of applications. Pipe diameters from DN25 to DN900 with wall thicknesses of up to 100mm can be bent to the purchaser's exact desired angle and radius (generally 2.5D and up) with custom tangent lengths on each end of the bend.

Complex compound bends can also be produced, including S bends and even helical bends for specialist applications.

Induction bending is compatible with a wide range of materials including all carbon steels, alloy steels, high X grade steels, stainless steels, nickel alloys, titanium and other exotic alloys.

Recently, Inductabend internally developed a new world-first method of bending that allows us to utilise induction bending for the forming of bends with radii from 14m and up, allowing for gradual consistent changes in direction to minimise wear on steel pipelines whilst maintaining their desired mechanical properties.

Additional services such as end preparations for welding, Victaulic grooving and coating are also available to customers when placing orders with Inductabend.

Inductabend also owns some cold field benders (up to DN1200 capacity) that are available for dry hire. **AMR**



INDUCTABEND

Shaping Australia for over 30 years

We specialise in applying our

INDUCTION TECHNOLOGY

to solve seemingly intractable problems

- Induction bending of pipe up to DN900, wall thicknesses up to 100mm.
- Carbon steels, stainless steels, clad pipe and other exotic alloys
- High X grade bends
Compound bends
Helix bends
Custom OD mandrels
- Structural steel section bending
- Fully customisable bend geometry
- Other specialist heating applications
- Onsite induction bending (large diameter high volume projects)
- Cold field bending machines also available for hire (up to DN1200)

For security of supply and the circular economy
we support Australian manufacturing

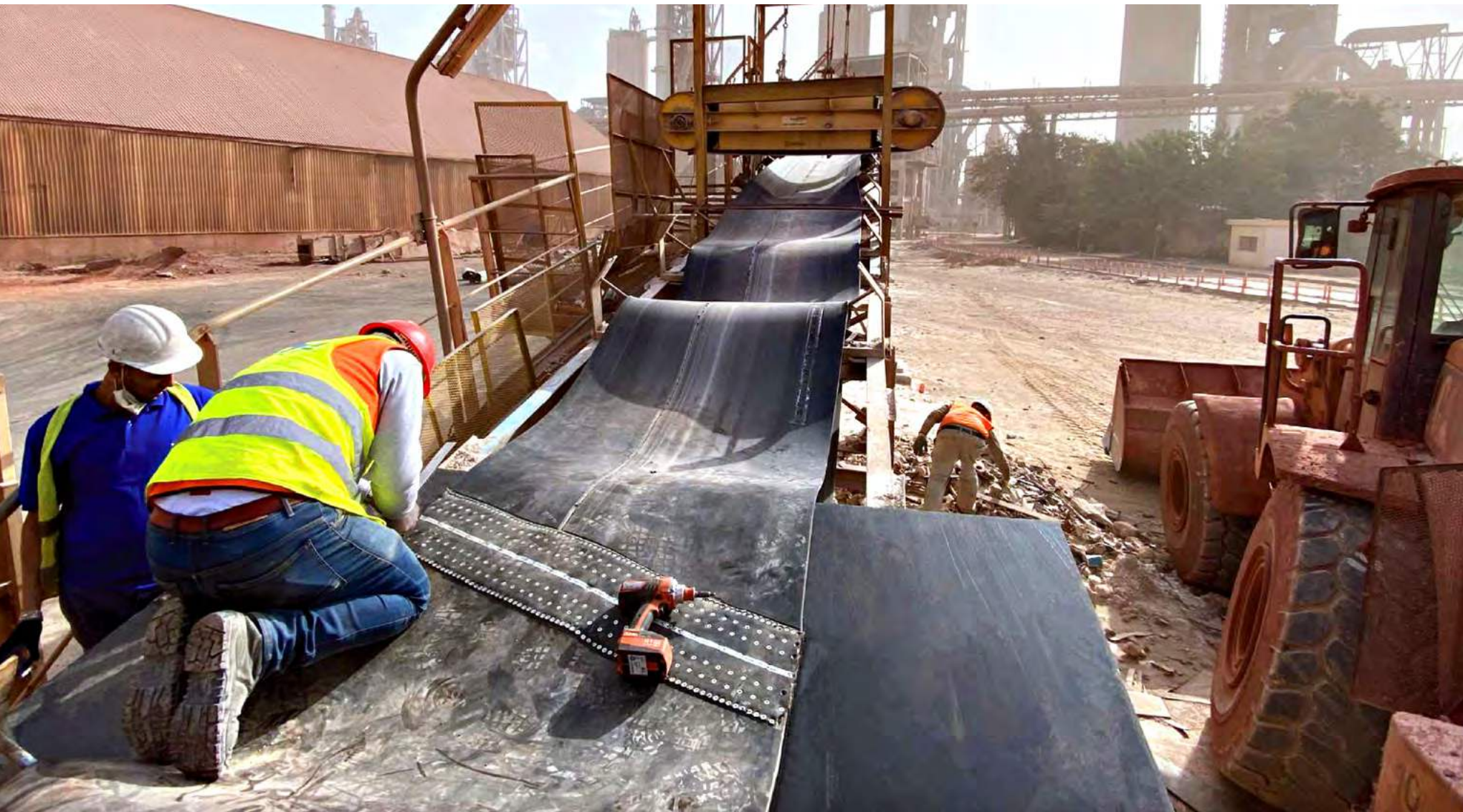
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inductabend.com

enquiries@inductabend.com.au

+61 (0)3 9315 1244

32 Frederick Rd Tottenham VIC 3012



MLT SUPER-SCREW® CASE STUDY

The only Super-Screw splice joint that offers flexible, permanent belt join that is innovative and easy to install

In this case, a phosphate mine long transfer conveyor belt had an emergency breakdown during production. A request for belt splicing by conventional hot splicing on a new belt was too challenging and complicated.



Customer Issues

Conveyor downtime was 16 hours with the previous way of belt splicing and on top of that, they needed 8 people to splice the belt on site.



Customer Belt Technical Specifications

- Belt type: Ferroflex 2000N/mm
- Belt length: 2.2km
- Belt width: 1600mm
- Product being conveyed: Sterile Phosphate

MLT Answer

The only solution that made it possible without having expensive downtime was the use of MLT SUPER-SCREW® Original flexible splice joint that can be quickly installed on-site. This has resulted in reduced conveyor downtime (5 hours) and the number of people allocated to belt splicing.



MLT MS® FASTENER CASE STUDY

The only screw-on metal fastener that is innovative and easy to install

The MS® Fastener is an innovative and fast solution to join your belts by simply screwing them together. Designed and patented by MLT, this mechanical splice is extremely easy to install. MS® Fastener is a metal fastener to be installed with screws. The MS® falls into the category of truly revolutionary in the metal fastener market, as it is more economical, practical, and safe to use.

Customer Issues

A coal-powered power station in Central Coast NSW had multiple emergency belt breakdowns on all its coal feeder conveyors, a quick solution was required to rejoin new belts on-site with a metal fastener without the need for special tooling or installation templates.

Customer Belt Technical Specifications

- Belt type: PN450, 3 ply, M grade
- Belt width: 900mm
- Product being conveyed: Coal

MLT Answer

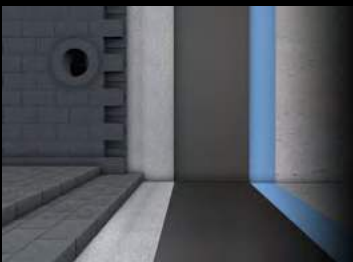
The only solution that made it possible without having expensive downtime was the use of MLT MS® Fastener which can be quickly installed on-site with a hammer and a cordless drill driver. Conveyor downtime has been drastically reduced as well as being able to install during a small window of opportunity for shutdown with production up and running again shortly afterwards.

For more information on MLT Group product range, visit
www.mltgroup-conveyor.com

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PROTECTION AGAINST **EXTREME** STRESSES



Steuler is your experienced partner for linings. Whether pickling or regeneration plant, vessel, flue gas line or reactor, whether Venturi scrubber, auto-clave or absorption tower – we have the expertise in a wide range of applications. In theory and practice.

We draw on this when selecting the acid resistant lining system for the process in question and in the specific advice we provide for you.

As a specialist, we naturally also offer very special solutions. To this end, we have exceptional, original technical know-how, for example: for high temperatures, auto-claves or pressure vessels.

Steuler consistently develops and im-

proves its product portfolio. This enables us to serve even the most complex and modern plant technology of our customers.

We combine sealing layers, mortars and ceramic materials to create solutions that are just right for your project.

In addition to having access to our extensive range of materials, we can also work out new solutions with our development departments at any time.

- Sealing layers based on polyurethane, epoxy resin, polyester resin (unsaturated), vinyl ester resin, furan resin; special formulations; rubber linings; thermoplastics
- Synthetic resin mortars based on

furan resin, phenolic resin, polyester resin (unsaturated), vinyl ester resin, various water glass mortars; special formulations

- Standard bricks, shaped bricks and special formats in various stone qualities (acid resistant ceramics, graphite and carbon stones, refractory materials)

The professional installation of our brickwork is always part of the service. Perfect performance from a single source.

Linings are subject to the highest stresses from individual media or combinations of different media:

- Chemical stress**
 - Chemical attack by media in liquid,

gaseous or solid state

Thermal stress

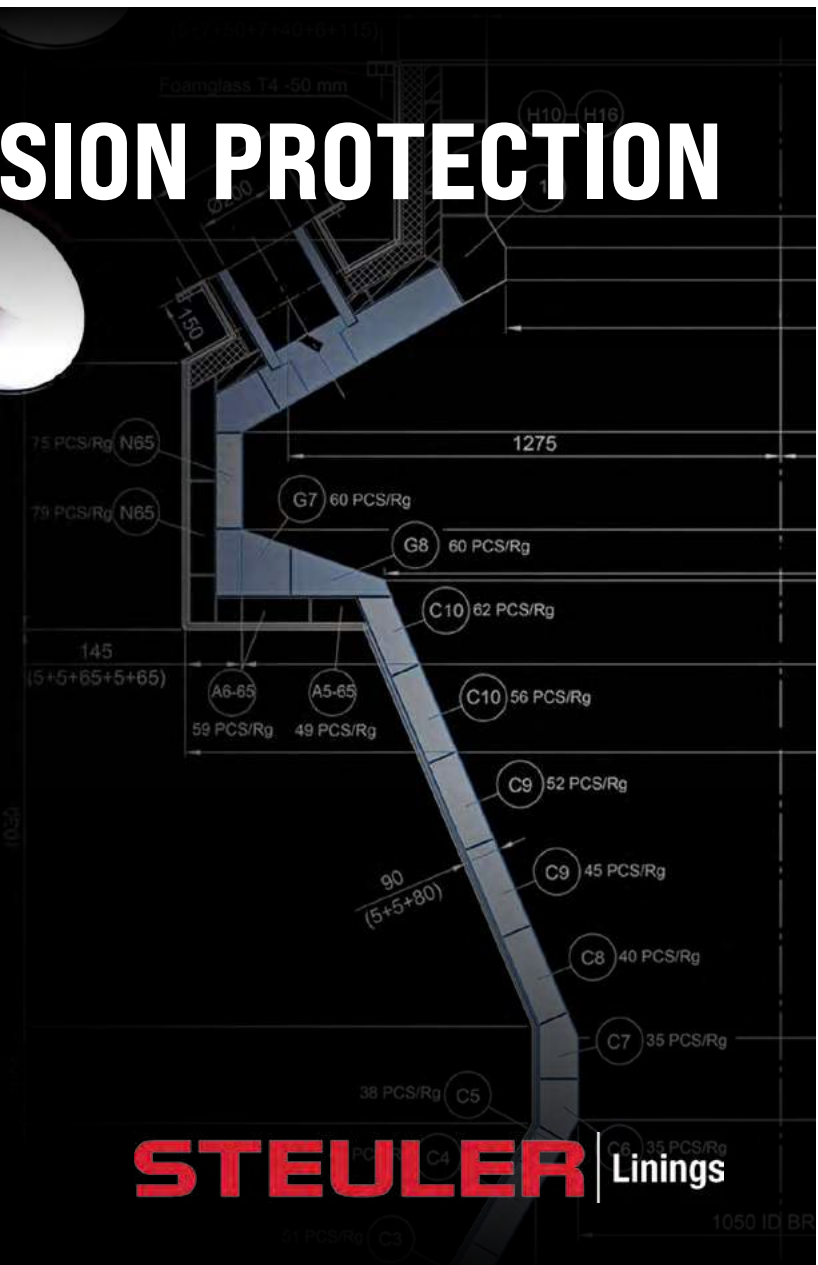
- Height of the temperature and different temperature distribution
- Temperature differences in the individual layers of the lining and to the surroundings
- Thermal cycling
- Different coefficients of thermal expansion for lining materials and construction

Mechanical stress

- Pressure ratios
- Vibration
- Abrasion
- Impact stress
- Passable by vehicles

AMR

THE **ULTIMATE** IN CORROSION PROTECTION



A Cut Above the Rest

HD Plasma and Laser Cutting Services provides an innovative and dynamic profile cutting service to all steel manufacturing industries within Australia.

The purpose-built, multi-function, steel processing business located in Bibra Lake, WA, is seen among the leaders in the steel cutting industry.

Laser Cutting

The technology of the HD Plasma and Laser Cutting Services machines delivers superior performance, giving the ability to provide clients with exceptional quality, together with 24-hour operations, shorter lead times compared with other conventional laser cutting machines.

- Cutting table size 4000 x 2000mm
- Capable of processing up to 20mm thickness mild steel
- Capable of processing up to 20mm thickness QT Material
- Capable of processing up to 32mm thickness aluminium
- Capable of processing up to 25mm thickness stainless steel

Plasma Cutting

HD Plasma and Laser Cutting Services operates three plasma machines - one Kinetic K4000 and two Kinetic K5000. These state-of-the-art, heavy duty combination plasma/oxy/machine centres can process a wide variety of materials at an extremely fast rate.

The 62m plasma cutting bed, together with 24-hour operations, allows high volumes of cutting to be achieved with short lead times.

- Counter sink/counter bore
- Drilling - 3mm up to 60mm
- Plasma cutting - 3mm up to 50mm
- Oxy-cutting - 60mm up to 300mm
- Bevelling - up to 50mm with maximum of 45°

Steel Plates

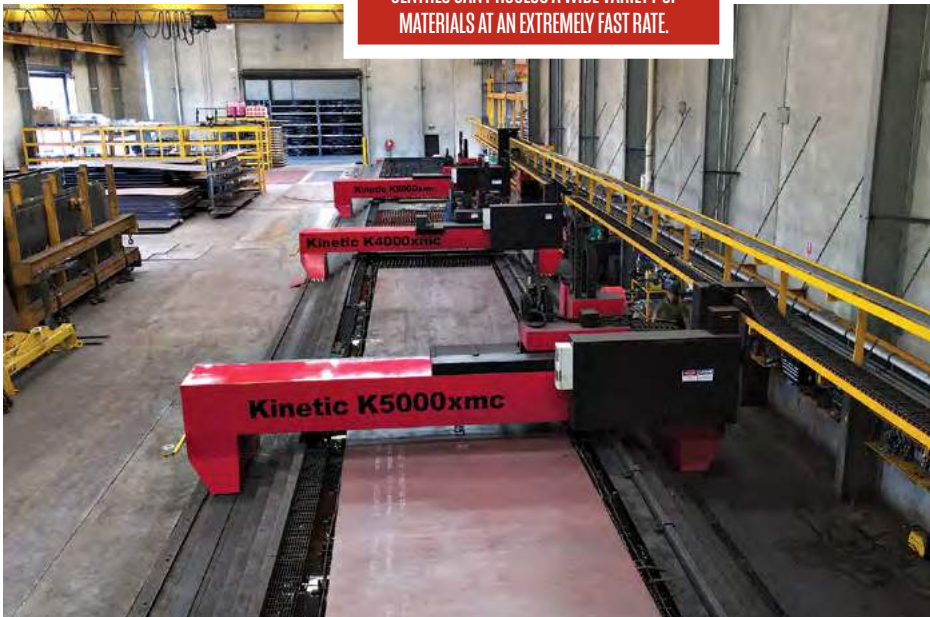
HD Plasma and Laser Cutting Services holds steel plate in stock.

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**

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
PBI, ZINCANEAL, GALVANISED & COLORBOND	UP TO 6mm
STAINLESS STEEL - ALL GRADES	UP TO 40mm



THE STATE-OF-THE-ART, HEAVY DUTY COMBINATION PLASMA/OXY/MACHINE CENTRES CAN PROCESS A WIDE VARIETY OF MATERIALS AT AN EXTREMELY FAST RATE.



A cut above the rest



HD Plasma & Laser Cutting Services Pty Ltd is a purpose built, multi-function, steel processing business located in Bibra Lake, Western Australia.

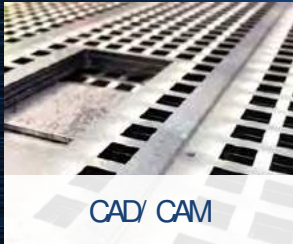
We can deliver an innovative and dynamic profile cutting service to all steel manufacturing industries within Australia.

HD Plasma & Laser Cutting Services philosophy of progressive service to our customers is what is bringing us to the forefront of the steel cutting industry.

A continual process of system and service development and refinement is where our key advantage lies. We constantly find new ways to add value to the service we deliver to you.

Progressive service and quality is about staying one step ahead.

Services



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www.hdplasmacutting.com.au

81 Discovery Drive, Bibra Lake WA 6163
Email: sales@hdplasmacutting.com.au



A TRUSTED LIFELINE FOR REMOTE SITES.

Established 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 or call +61 8 9031 1326



DESERT SANDS
CARTAGE CONTRACTORS
Est. 1989

We're Hiring!

**WE ARE LOOKING FOR
QUALITY MECHANICS
& MC DRIVERS**

Established Since 1989



✓ For all your transport and civil contracting requirements

✓ Supply of potable water to remote areas

✓ Side tipper haulage, including concrete, screened sand, dune sand, fuel and potable water

✓ Extensive experience in civil works and construction projects

GET IN TOUCH NOW

Rex Ryles 08 9031 1326 | office@desertsands89.com.au | www.desertsandscartage.com.au
Lot 501 Cox Street Laverton WA 6440

24/7 PREVENTATIVE AND REMOTE STEEL WIRE ROPE MONITORING, WITH MAGNETIC ROPE TESTING

Certex Lifting is ensuring mine site integrity with their magnetic rope testing (MRT) – a service that detects broken wires, distortions and corrosion on steel wire ropes.

Certex Lifting is one of the country's largest lifting equipment and service companies and they have solidified themselves as the partner of choice for operators in need of diverse lifting and rigging solutions.

One of their specialties is MRT, a non-destructive, magnetic and contactless procedure with a long and successful history increasing safety and efficiency in industrial settings.

The method is endorsed by various standards as a strong assessment method for heavy lifting via steel wire ropes.

Certex Lifting Production Manager James Shine said the Australia company used both innovative and tried and tested

methods to ensure asset integrity across mine sites.

James said Certex Lifting was also known for modernising older adopting new methods to fit to address a greater variety of issues or irregularities.

"Here at Certex Lifting, we have allied with reputable suppliers and leverage the use of state-of-the art equipment to provide magnetic rope testing (MRT) services to a wide range of industries," James said.

"Our machines equipped with local fault and loss of metallic area capabilities, allow us to provide our clients with a comprehensive report on the status of the rope that outlines the severity of faults such as external and internal broken wires, corrosion and wear, that is otherwise unattainable from traditional visual inspections.

"Rope degradation often remains unnoticed as it may start from the inside out,

increasing in severity, until catastrophic rope failure occurs.

"It is vital to determine and monitor the rope condition early on to ensure the safety of users, minimise machine down time, and maximise the life span of ropes.

"Data from the inspections then also allows us provide clients with recommendations for suitable maintenance procedures and schedules, or to justify decreasing planned rope replacement frequency."

MRT fits into Certex Lifting's mechanical testing and inspection services, spanning load testing, destruction testing and weight verification.

The company's facilities have full-service capabilities to keep mine sites compliant, including inspecting, repairing, testing and certifying lifting equipment.

Certex Lifting has 10 locations across Aus-

tralia with all sites stocking a comprehensive range of lifting equipment to suit a variety of client needs.

Whilst the in-house services are designed to provide a prompt service, the company is equipped to ensure it can reach clients in remote locations with their mobile services.

"Not only is it the most comprehensively stocked mobile facility in Australia that can test and repair most standard items on site, it's also a NATA accredited facility," James said.

"This allows us to attend to your business needs at short notice, and we provide testing certificates online within 48 hours and sooner if required.

"We can also provide 24 hour online access to all certificates and registers.

"Get in touch with us today."

AMR



CERTEX

Lifting Products and Services



Lift it, rig it & test it with **Certex Lifting**

- We offer comprehensive and specialised inspection and testing services, including load testing, NDT, destruction testing and weight verification performed by competent inspectors.
- Our NATA endorsed mobile service allows us to inspect, test and repair most lifting equipment on site.
- We are equipped to help you with Steel Wire Rope Lubrication, Tensioning, Inspection, Rope Monitoring Systems, flaw detection, Splicing and Socketing.
- We are experts in designing and constructing customised lifting solutions for some of the most complex and heavy lifting tasks. Our team works closely with the customer to ensure reliable yet fast turnaround on all jobs.
- We offer a comprehensive range of customised and standard lifting equipment from the world's leading manufacturers. We can supply most items from our 10 locations across Australia.

DON'T HESITATE TO GET IN TOUCH | 1800 CERTEX | www.certexlifting.com.au

RUGGED TV PROTECTION: A MUST-HAVE FOR THE MINING INDUSTRY

In the unforgiving world of mining, where dust, water, and physical impacts are everyday challenges, safeguarding your equipment is paramount. This includes protecting your valuable TVs and displays from the harshest of conditions.

That's where Octopus TV Enclosures comes in, offering a range of certified enclosures designed to meet the rigorous demands of the mining industry.

IK10: Unmatched Impact Resistance
In the mining industry, heavy equipment and machinery are in constant motion. Accidental impacts are a common occurrence. That's where IK10 certification shines. It represents the highest level of impact protection available, ensuring your TV remains operational even after severe physical impacts. With IK10-certified enclosures, your displays can endure the toughest mining environments.

IP56: Defying Dust and Water
Mines are notorious for generating dust

and being exposed to water ingress. An IP56-rated enclosure offers robust protection against both dust and powerful water jets. When dust and water are part of your daily environment, having an IP56-rated enclosure means your TVs remain reliable, reducing downtime and maintenance costs.

IP65: Defending Against Extreme Conditions
For mining operations situated in the harshest climates, IP65-rated enclosures are the go-to solution. These enclosures are dust-tight and can withstand water projected from a nozzle.

Whether it's the scorching heat of a desert mine or the relentless rain of a tropical location, an IP65-rated enclosure ensures your TVs keep working efficiently.

Octopus TV Enclosures: Designed for Mining
Octopus TV Enclosures understands the unique challenges of the mining industry,

and they offer a range of solutions tailored for the job:

Level 1: Indoor Overlay Kits: Designed for mining control rooms, these kits protect your TV's LCD panel from accidental impacts and small objects, all without sacrificing visual clarity. They are ideal for monitoring and communication hubs within mines.

Level 2: Indoor TV Enclosure: When more comprehensive protection is needed, Octopus provides all-aluminum enclosures with polycarbonate fronts. These enclosures secure cables, inputs, and can even deter theft. They can be recessed into the wall or wall-mounted, making them suitable for control rooms and break areas.

Level 3: Outdoor TV Enclosure: For outdoor mining operations where equipment is exposed to extreme conditions, Octopus offers enclosures designed to endure. These enclosures come with multiple fans

controlled by a thermostat, ensuring optimal ventilation in the scorching heat or rain. With options for various TV sizes and customisation, they are a robust choice for outdoor displays.

Octopus TV Enclosures' products combine lightweight, rust-free aluminum housing with anti-glare polycarbonate fronts, providing a durable solution that meets the rugged requirements of the mining industry. When it comes to protecting your TVs in the demanding mining environment, Octopus TV Enclosures delivers the durability and reliability you need.

Keep your operations running smoothly with TV protection designed for the toughest conditions.

For more information, visit
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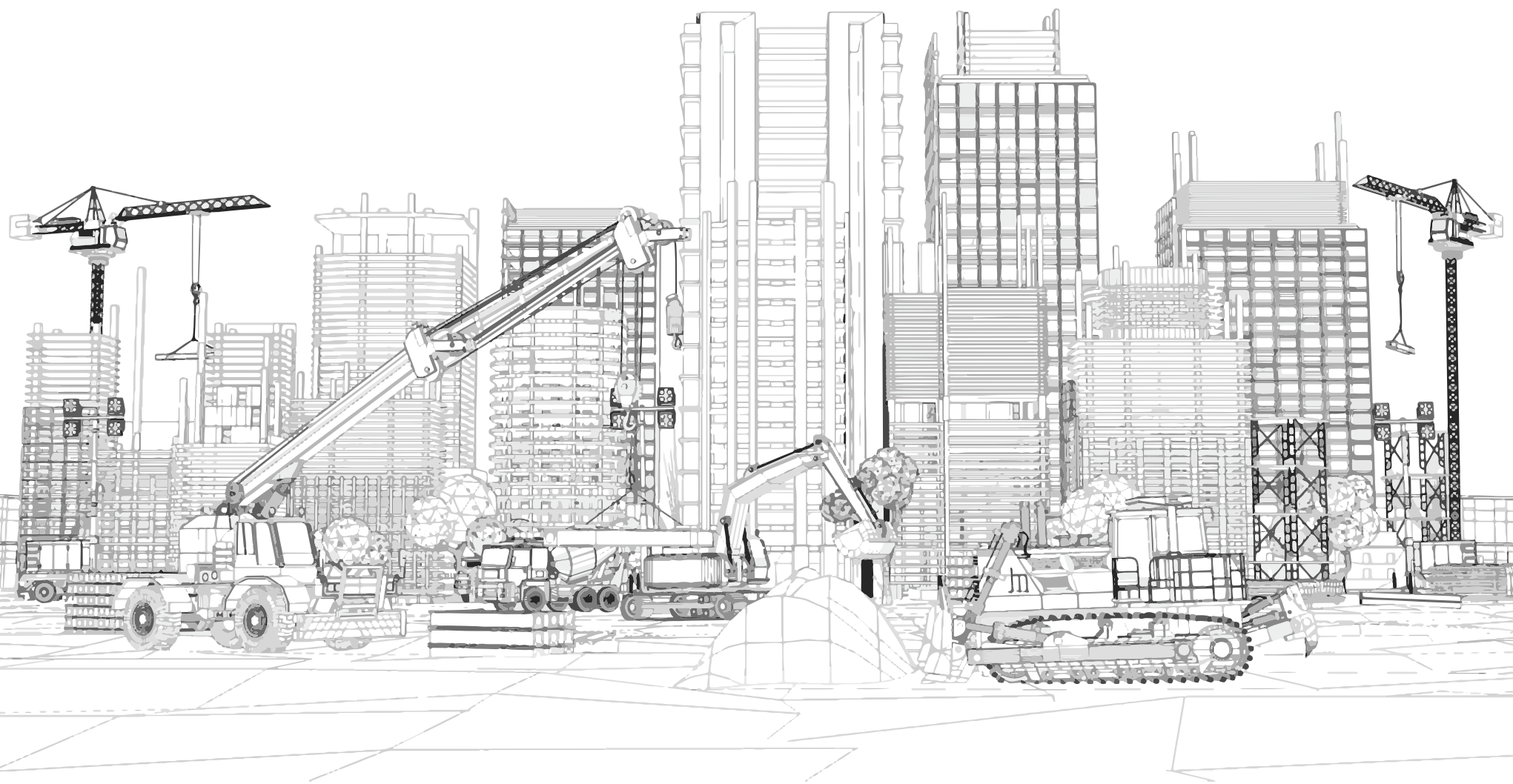
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REVOLUTIONISING MINING THROUGH A CIRCULAR ECONOMY APPROACH

Environmental concerns have long been associated with resource extraction. However, a shift toward more sustainable practices and the rise of the circular economy is a concept gaining momentum. In the field of construction, the impact of the circular economy, particularly in the mining industry, is significant.

Specialist durability consultants BCRC have become a critical partner for asset owners when navigating the complex circular economy process of their projects, from initial planning to achieving the best design life.

The circular economy is a regenerative system that aims to minimise waste and maximise the value of resources. In the mining industry, this approach not only seeks to improve efficiencies, but reduce environmental footprint.

As pioneers in this space, BCRC embraces the circular economy principles and apply them to the construction aspect of mining projects.

Maximising resource efficiency

In the planning phase of a mine construction project, decisions made at this time can have long-lasting impacts. BCRC's experts work closely with mining companies to optimise design and use materials that have a renewable and recycled focus.

Careful and considered material selection is critical, specifically ones that can be reused or recycled at the end of their lifespan. BCRC helps clients reduce their

environmental impact by adopting this proactive approach that minimises waste, and delivers cost savings by decreasing the need for new resources.

Material selection for energy efficiency

Selecting the right materials is imperative for not both durability and energy efficiency during the operational phase of mine construction. This requires a collaborative effort between both parties – BCRC and mining company – to identify materials that can help reduce energy consumption. "For example, BCRC may recommend the use of advanced insulating materials that can significantly cut down on energy usage," said BCRC General Manager, Marius du Preez. "By making informed material choices, mining companies can operate their facilities more sustainably and economically."

"If we look at maintenance practicality, we support mining companies in selecting materials that are easy to maintain and repair to reduce downtime and increase operational efficiencies."

BCRC also promotes predictive maintenance strategies by leveraging data analytics and monitoring technologies. This enables mine owners to accurately predict when equipment or infrastructure will require maintenance. The approach not only extends asset life, but also reduces the environmental impact associated with frequent replacements.

"One of our ultimate goals in the construction aspect of a mining project is to help

mining facilities reach their optimal design life," says du Preez. "This means that the infrastructure remains functional and efficient for as long as possible, minimising the need for costly renovations or replacements."

BCRC's expertise in durability and materials science plays a pivotal role in achieving this goal. By selecting materials that are known for their longevity and resistance to wear and tear, mining companies can save both time and resources over the long-term.

Benefits of the circular economy

A circular economy approach combined with BCRC's expert guidance delivers several benefits to the mining industry.

From an environmental sustainability perspective, there is an opportunity for miners to implement strategies to reduce waste, conserve resources, and minimise energy consumption. These practices will provide a strong sustainable platform for mining operations for the future ahead.

"Miners can achieve significant cost savings by selecting energy-efficient, durable materials, and impactful maintenance measures," says du Preez.

"This approach not only enhances the longevity of their plant equipment and machinery, but also optimises their budget allocation for greater efficiency. A more sustainable and profitable business model can therefore be achieved, which benefits

both the bottom line and the environment."

Incorporating circular economy principles into operational practices can prove beneficial for mining companies, not only in terms of complying with increasingly stringent environmental regulations, but avoiding potentially significant penalties.

By embracing this approach, companies can reduce their overall environmental impact, while simultaneously exploring new and innovative methods for waste reduction and repurposing. This in turn, can help establish a more sustainable and responsible mining industry for future generations.

"Adopting circular economy principles promotes responsible behaviour and helps preserve the natural resources in which a mine operates," says du Preez. "It also improves a mining company's reputation, making it more appealing to stakeholders and investors. The circular economy will undoubtedly continue to transform the mining industry, and BCRC is excited to play a role when it comes the construction process of essential mining infrastructure."

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

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BRINGING TWO NEW MACHINES TO THE QUARRY, MINING AND SOIL REMEDIATION INDUSTRIES

Crusher & Screens Sales Pty Ltd (CSSH) are IMS from Northern Ireland Australian distributor, IMS manufacture a range of plant including pugmills and blenders. They have just released two new machines this year for the quarry, mining, and soil remediation industries. The new PM1200-20TB Track Pugmill follows on from the top selling PM1050-16TB Track pugmill that are operating throughout Australia in quarries, major construction sites and remediation projects.

The main difference between the two pugmills is the new PM1200-20TB has two five-meter-long feed hoppers holding 10m3 each with separate feed hopper conveyors both fitted with belt scales and controlled by a PLC updated control and recording system that can be operated by an iPad in a loader or site office from the machines

own Wi-Fi system up to 100 meters from the plant. The pugbox has been extended due to increased power percentages of products such as RCC and has the option of two powder hoppers with load cells and rotary valves for blending two powders at once on site avoiding the cost of premix bulk blending or having two silos with different powders ready for mixing different powder blends. The other options are vibrating hydraulic tipping grids and the ability to add two liquids at the same time, the plant is powered by a CAT C7 motor.

CSSH have just commissioned a new PM1200-20TB pugmill with an IMS mobile 45 tonne silo for Braeside Quarry on the New England Highway near Warrick Qld. A Braeside company representative advised the new pugmill offered them several advantages in their product management

and quality control with accurate blends through the twin feeder hoppers and PLC control and recording system, they know have certainty that correct percentage of fines are being added to their road base with moisture control and the option of CTB or in one process reducing costs and reports to confirm the batch percentages. The other advantage is they can have separate products in the two feed hoppers waiting for trucks to arrive and remote start the correct hopper for moisture control loading directly into the truck and trailers. All this adds confidence to Braeside Quarry clients that their product is compliant and will not cause down stream problems on roads and construction sites.

The second new product IMS have introduced this year is the BP1200-48TB electric four hopper track blender, all four

hoppers hold 12m3 with separated feed hopper conveyors fitted with belt scales and the same new updated PLC control and recording system as the PM1200-20TB pugmill. The BP1200-48TB is powered by a CAT C7 generator that can be connected to mains power and power a 24-meter radial stacker for extra stockpile capacity. The Nord electric gear drive motors allow for a wide range of accurate speeds to suit low percentage blends. The blender can be incorporated with the IMS pugmills and controlled by a common PLC control and recording system and has the option of adding vibrating tipping grids as well.

IMS also produce an electric modular pugmills offering up to four feed hoppers, electric and hydraulic wheel and track conveyors and single feed hopper blenders along with screening plants. **AMR**



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No anchoring at top of pit.



Layflat pipeline connected to the ring main.

DEEP PIT? PUMP SAFELY WITH FLEXIBLE HOSE

Pumping water out of deep pits or open-cut mines is a critical aspect of mining operations to keep the work area dry and safe. The challenges of running a pipeline up the high pit wall associated with poly pipe are eliminated when using flexible layflat hose.

In mining operations, especially in open-cut mines, water can accumulate due to natural groundwater flow, rainfall, or seepage from surrounding sources. Removing this water is critical in maintaining mining operations by ensuring access to the valuable orebody and supporting worker safety.

Typically, a pump is strategically placed at the bottom of the pit to which a pipeline is connected, running up to the top of the pit. From there, the water is pumped along another pipeline and discharged elsewhere.

The most common type of pipeline used from the pit and up the high pit wall has been HDPE poly pipe. However, poly pipe can present several challenges regarding pressure factors, strength issues, and temperature sensitivity. These challenges are eliminated with an alternative flexible pipeline developed in Australia. Crusader Hose has engineered rapid in-pit dewater-

ing systems for safer handling up high pit walls and efficiency benefits in time and cost.

The issues with poly

The first issue refers to its pressure rating. Ordinary HDPE pipe does not have a high-pressure rating. For poly to be used in high-wall applications, the HDPE pipe must be thicker to gain pressure. This makes it heavier and stiffer, which becomes more difficult and dangerous to handle down or up a mine wall.

The second issue relates to its inherent rigidity. In addition to the logistical challenge of installing this heavy, stiff pipe, an HDPE pipeline does not take the contours of the benched slope. The downward force this creates and the pipeline's weight requires proper anchoring and support systems to ensure the pipeline stays in place.

Anchoring the pipeline securely at the top of the pit requires either concrete blocks

or steel supports and workforce hours using heavy machinery. This anchoring is a major task.

A third issue with poly pipe refers to its temperature sensitivity. Polyethylene can become brittle at low temperatures or soft at high temperatures. Extreme temperature variations within the pit can affect the pipe's performance.

The versatility of flexible layflat hose

The engineers at Crusader Hose have developed a flexible hose for dewatering pipelines that handle high pressure of up to 4000 kPa. UV resistant and able to handle extreme temperatures, with the 6" diameter 3500 kPa working pressure pipeline weighing only 3.4 kg/m, it exceeds the qualities of its poly counterpart.

Its flexible characteristic allows the pipeline to take the profile of the benched and sloping mine wall. The weight of water inside the flexible hose holds the pipeline down against the sloping terrain and does not put strain at the top of the pit.

"With the downward force nearly eliminated, the hose is not prone to sliding or falling down, removing a major handling and safety risk," said Francois Steverlynck, Managing Director of Crusader Hose.

Eliminate the need for complex anchoring

Recently returned from a large mine in Western Australia, Francois saw firsthand the versatility of their flexible pipeline.

"With a flexible layflat pipeline, having as little as 10 m laid flat at the top eliminates the need for an anchor," said Francois.

"One of the dewatering supervisors at a major iron ore mine in the Pilbara told me that they use 15-ton concrete blocks for anchoring poly pipe."

"With our rapid in-pit dewatering systems,

you remove one big safety risk by not having to position 15-ton concrete blocks at the perimeter."

Installing a flexible pipeline down the wall - Positioning the reel

The hose is supplied in lengths up to 500 m. The hose is wound up onto a reel like an electrical cable is wound onto a drum.

Although smaller reels are used for shorter lengths or smaller diameter hose, the maximum reel size has 2.4m diameter flanged ends with a shaft up to 2.0m long. This loaded reel, safely secured onto an A-frame or tethered to a Franna, is placed at the top of the pit, >10 m from the edge. Depending on site access, however, the reel can also be placed at the bottom of the pit.

Deploying the hose

The hose needs to be pulled off the reel by a rope. "The typical method to get a rope down from the top of the pit to the bottom is by firing a crossbow or using a drone," says Francois. "A thin rope is used to pull down a thicker and stronger one," he explained. The rope at the bottom is connected to a vehicle or winch, which drags the flexible hose down into the pit.

Attaching the pipeline with secure couplings

The engineering team at Crusader Hose have listened to feedback from the mining industry and developed a secure and easy-to-use coupling clamp. The hose can be easily cut on-site using a utility knife or hacksaw. The coupling is then fitted into the hose and attached with Boa™ clamps. "You can pump with confidence," said Francois.

No recycling issues

Further benefits include no recycling issues; roll it back up and redeploy elsewhere. "It has a 200-year lifespan, just like poly. The technology is here. It ain't going nowhere," concluded Francois. **AMR**



Three pipelines up the high pit wall.



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FILTERSAFE INTRODUCES OPERATOR SAFETY IN WATER FILTRATION SYSTEMS TO AUSTRALIAN MINING



Proper water filtration in mine operations is critical to ensure the long life of equipment such as dust suppression, process water infrastructure and desalination systems.

Together with Filtersafe Australia, WA distribution partner APT Water have released automatic screen filters and self-cleaning disc filters that meet the strictest safety standards whilst minimising discharge wastewater.

Screen Filters

With up to 4m² of filtration area in a single screen and a single motor arrangement, the Filtersafe Titan series filter is the largest horizontal automatic screen filter on the market.

In traditional screen filter designs, large screen areas are installed with vertical filters, multiple motors and multiple screens

mounted high off the ground. To maintain these filters, there is a requirement for elevated work platforms, overhead cranes and gangways. This creates a high capital cost for infrastructure, raised workings heights and overhead load concerns.

In contrast, Filtersafe allows maintenance personnel at ground level to remove the screen and scanner bar simply and safely without being at height or under a suspended load.

Operators can feel safe when using Filtersafe filters as all are manufactured and certified to AD2000 Merkblatt pressure vessel standards.

Furthermore, the Titan filter is fitted with Filtersafe's patented cleaning technology, Everclear. By combining their NozzleX close proximity nozzle with Smartweave high performance filtration screen tech-

nology, Everclear produces unparalleled removal rates of organic matter and suspended solids.

Disc Filters

Using high quality technical plastics, the Azud disc filter technology ensures the complete absence of corrosion when being used in poor quality water. When in contact with water, these plastics don't constitute a suitable surface for the growth of microorganisms.

With compressed polymer discs, the Azud disc system filters water down to five micron. The Azud Helix device keeps larger solids in suspension, resulting in water savings through less frequent backflushing. For additional wastewater savings, the Azud Air Assist system reduces backflush water by a further 80%.

With the fine filtration that can be achieved

by these disc filters, it's possible to use them in the replacement of traditional media filters and cartridge filters. Not only will this save water, but it will provide a safe environment for operators as they're not handling potentially hazardous waste media and cartridges.

Andrew Dean, Director of APT Water said "this exciting partnership with Filtersafe Australia brings together experience in filtration equipment and pumping systems, two key complimentary products in mining water systems.

With our ability to manufacture packaged equipment in house, we can now supply a turnkey pump and filtration solution suitable for mining operations."

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THE CONTAINER MODIFICATION SPECIALISTS

Wherever you go these days, you seem to see shipping containers, like a statuesque symbol of the versatility of man in the industrial era. They are in numerous states of disrepair and customisation, the local coffee shop, housing, and secure storage, to an entire mine site. They offer the type of versatility and customisation potentially not considered in their original creation, but now flourishing. Your site office may have covered hundreds of thousands of sea miles, with a million tons of cargo before being repurposed into its current use. It really is the true definition of recycling.

Kevin Cooper first founded Sea Containers WA in 2008, starting in a small office near the wharf in Fremantle. He had a vision of providing a strong focus on high levels of customer service and responsiveness, and with his entire working life spent in the shipping industry, he was well placed to do this. Over the years the business grew, and moulded itself on the demands of local industry to provide a well-rounded service ranging from hire and sales, to storage, specialised equipment, and an extensive and diverse modifications capability.

Modifications have proven to be an extremely successful arm of the business, and has had a huge influence on the way the business has developed.

Culminating in the creation of its modernised HQ in Wattleup, Perth, Sea Containers WA have a 30,000 sq/m purpose-built facility featuring container storage of up to 1,800 units, washing facilities, inspection and recertification areas, spray booths, specialty container fabrication and finishing workshops, as well as its crown jewel, the custom container office. There are also a fleet of forklifts, contractors, and trucks resupplying stock and feeding products to

customers both locally and further afield.

Modification of containers is a fascinating and exciting component of the many services offered by Sea Containers WA. A highly experienced team with decades of combined experience can offer solutions and support in creating the best containerised solution to meet specific customer needs.

The company has heard just about every

request from its customers over the years, and have never skipped a challenge. With the resource sector heavily reliant on containers, the company has a huge range of options – from offices, cribs, ablutions, workshops, dangerous goods storage and lube containers, to combinations of these in large-scale dome shelter workshop and office facilities. All works are engineered and welded to code to ensure they meet the demands of the harsh North West and potential cyclonic wind conditions, as well

as meeting the required Codes and Standards imposed by the mining sector.

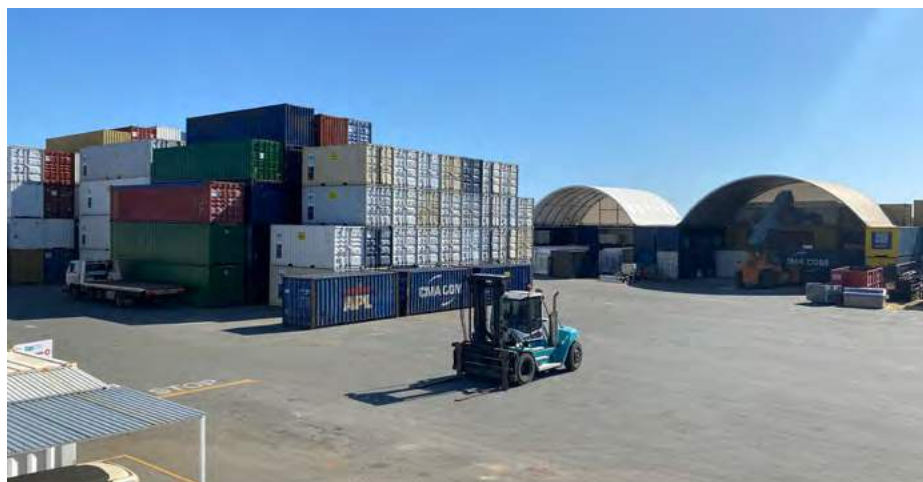
Complimenting the ease of transport, and structural security of Shipping Containers is the application of Off Grid power. The synergies between a highly mobile product and Solar, Wind, Generator and Battery power support stretch the utility of Modified Containers beyond the grid. Total Containers has focused heavily on development in this area and have multitudes or options to take away that reliance on mains power, further supported by water and waste storage and capture, composting ablutions, and durable construction and security.

The company just celebrated 15 years in the business. During this time, it has expanded nationally, necessitating a name change to TOTAL Containers, with offices in regional WA, Victoria and a JV established as Sea Containers NZ that spans New Zealand and the Pacific Islands.

Built on a platform of customer excellence, the company now has a dedicated national team of more than 40 employees. They pride themselves on guaranteed service levels and a commitment to innovation and diversification. A specialised team works across areas of administration, operations, and modifications, providing customers with not only containers, but comprehensive solutions. This is backed by strong relationships within the West Australian Resource sector, which are testament to the company's quality products and services.

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REAZ's success is built on the strong relationships it has forged and nurtured between manufacturers and vendors in the motor control and automation market since its inception. Its service and extensive product portfolio continue to reinforce its reputation as Australia's most reliable source of competitively priced high-performance products.



REAZ source some of the best leading-edge products, dependable technologies and the latest technological advances to give customers the best user experience. The technical and commercial experience covers sales and product support as well as service, commissioning and programming by its dedicated sales and technical teams.

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UNVEILING THE VIBRANT ROLE OF VIBRATORS IN CONCRETE BATCHING PLANTS

Concrete, often referred to as the backbone of modern construction, has the power to shape our world. The very structures we live and work in, the bridges we cross, and the roads we travel, all begin as batches of carefully mixed concrete. To ensure that this foundational material is of the highest quality and durability, concrete batching plants play a crucial role. Within these plants, vibrators, both electric and pneumatic, and flow aids are the unsung heroes that ensure the concrete's reliability. In the heart of Australia and New Zealand, Oli Australia shines as the prominent supplier of these vital components, and its contributions are felt far beyond the concrete industry.

Concrete production is a precise science, demanding uniform consistency and the absence of air bubbles. This precision is achieved through the meticulous use of vibrators. These quiet powerhouses effectively compact the concrete mixture, preventing segregation and ensuring that the final product is strong and dependable.

Oli Australia's range of vibrators, including electric and pneumatic options, along with flow aids, have become the cornerstone of

the pre-mix concrete industry. By providing products that guarantee smooth and consistent concrete flow, Oli ensures that every batch meets rigorous quality standards. Their role is fundamental in the production of concrete that's free from defects and voids.

What truly sets Oli Australia apart is its team of fully trained and experienced experts. In an industry where precision is non-negotiable, their guidance and expertise are invaluable. Oli's experts not only supply these essential tools but also offer crucial insights on optimising their use, enhancing the efficiency of concrete batching plants.

The construction industry operates in a world of fast-paced demands, and Oli Australia is acutely aware of this reality. Instant availability of their products ensures that construction projects are not delayed. As a trusted partner, Oli Australia prides itself on its ability to provide the necessary components promptly.

Outstanding quality is Oli Australia's hallmark. Their vibrators and flow aids are engineered to last, standing up to the harsh-



est conditions and providing unwavering reliability. In an industry where structural integrity is paramount, this commitment to quality ensures that the concrete produced is not just dependable but also safe and durable.

While Oli's vibrators are extensively used in the concrete industry, their applications extend far beyond. These vibrators find their place in the mining and extractive industries, facilitating efficient material handling. Furthermore, they play a crucial role in the offshore drilling sector, where reliability is of utmost importance.

In conclusion, Oli Australia has earned its reputation as a reliable partner for the concrete industry across Australia and

New Zealand. They don't merely supply vibrators and flow aids; they offer a team of experts, instant availability, and unwavering quality. In the world of construction, where the foundation of our built environment is laid, Oli Australia stands at the forefront, ensuring that every project meets the highest standards of reliability and durability.

Vibrators in concrete batching plants may not be the most visible components, but they are undoubtedly the heart of quality construction. When it comes to these vital components, Oli Australia is not just a supplier; they are a dependable ally, always just a phone call away, ready to aid in constructing a more stable and sustainable future. **AMR**



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geographie

and the

IMPORTANCE OF MANUFACTURING QUALITY PARTS

The design and manufacture of heavy machinery parts is important in any operation and Geographie, a Western Australian-based engineering and manufacturing company, have built a name for themselves as the go-to supplier for high quality parts.

Initially replicating parts for earthmoving equipment including excavators, trucks, loaders and dozers, Geographie changed up its offering to the industry to allow customers to choose a higher standard of product, or to create their own products.

"We found that replicating parts wasn't really where the customer wanted us to be,"

Innovation Development Project Manager Ryan Hyder (pictured left) said.

"What they really wanted to do was to enhance their mining fleet and reduce their maintenance times. The way we envisaged that was by designing and engineering enhanced performance parts or making specialised tooling for them.

"Enhanced performance might be changing things like materials, design features and different types of heat treatment on those parts which will enable us to have that part in their fleet for a longer period of time, reducing any downtime on their fleet."

Research and Development

With vendor relationships being particularly important within the industry, Geographie consider their team of Client Relationship Managers (Brita Phillips pictured centre & former Relationship Manager Shaz Ramlee right) 'the people on the ground'.

These managers roles are to really understand the clients' problems and then help the customer dis-

cover what can be created to help to solve them.

Geographie's product team is dedicated to creating the enhanced performance parts, reverse engineering items to understand how they may have been created and discovering what could be improved, plus conducting failure analysis when a part may not have made its expected lifespan hours to understand why.

"Our engineers and design team will come up with potential customer solutions and create testing plans for these where we'll use computer-aided test samples and see how they react from a theoretical point of view," Ryan said.

"From there, we can give our production team engineered drawings and everything to manufacture what we've developed where they'll manufacture prototypes or any modifications, we need which will then go through extensive in-house testing."

If these in house tests are successful, then the solution can be taken on site and applied to a client's machinery for further trials.

The Geographie Difference

What sets Geographie apart from the competition is that they care about what they do, they want to innovate, help the customer make incremental gains and solve their issues for the long term.

"At the end of the day they [the customer] really want to have their fleet working and they don't want downtime or broken machines," Ryan said.

"We really care about doing that for our customers and understanding the importance to them on what it means to have a consistent fleet operating.

"Where we stand out is that we can provide that, and we're not shy about doing it — we have a whole relationship management team and engineering department dedicated to solving for the customer, backed up by a vertically integrated manufacturing plant."

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www.geographie.com.au,
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Securing your critical infrastructure

The essential role of security in safeguarding compliance and operational continuity

Managing a smart and connected network presents many challenges, especially in the face of escalating cyber security threats. Maintaining the integrity and security of the network is essential when that network is driving critical infrastructure.

To build a world-class solution, you need a network that is secure by design, offers visibility of assets across the network, and provides the necessary alerts and controls to take action quickly.

Safeguarding industrial operations and ensuring operational continuity and compliance in today's environment requires real-time security monitoring and advanced threat detection to proactively address cyber security risks as they arise.

Three key considerations for the security of your critical infrastructure and operational technology are visibility, architecture and compliance.

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Everything™



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Helping your business to mitigate cyber security risks and ensure compliance to all industry, regulatory and operational standards.

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- Threat & Risk Assessments



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> Visibility

Do you know what devices you have on your network?

You can't secure what you can't see. Many organisations don't have a clear picture of exactly what devices are connected to their network, let alone how secure those devices are. With more devices being added to the network all the time, the attack surface of an organisation continues to grow almost daily. That's why asset discovery is a critical component in securing critical infrastructure against rising cyber threats.

A lack of visibility of OT (operational technology) assets across the extended network is common, and means you don't know what's connected, if it's failing or if it's secure.

Our asset discovery and vulnerability capabilities include OT, IIoT and IoT device recognition, industrial protocols across BACNET, Profinet and Modbus, Passive Agentless, and PLC and SCADA reporting. With this visibility, organisations can maintain an up-to-date inventory of all OT assets, including devices, sensors and controllers, and better understand the attack surface for effective implementation of security controls.

> Architecture

Is your network secure by design and future-fit?

Many OT networks were created using old architecture and legacy systems, often without the monitoring and management required to adequately protect infrastructure and keep the organisation operational, secure and compliant.

A security focused and future-fit network architecture is designed to prioritise cyber security while also being adaptable and scalable for evolving technology trends and threats. These secure networks incorporate key principles including:

- ✔ Zero trust architecture (ZTA)
- ✔ Identity and access management
- ✔ Continuous monitoring and threat detection
- ✔ Scalability and elasticity
- ✔ Resilience and redundancy
- ✔ Compliance

Network architecture that is secure by design and ready for the future is characterised by its proactive approach to cyber security, adaptability to changing landscapes and a commitment to safeguarding operational systems and data against evolving threats. These networks are designed with the understanding that cyber security is an ongoing process, not a one-time activity.

We help to secure critical infrastructure with world-class smart and connected networks to power mines, campuses, water pipelines, energy grids, distribution centres and transportation systems. Based on industry best practices, our approach delivers strategies for resilient critical infrastructure network architecture and allows for quicker execution whilst creating your blueprint for a secure and resilient future.

> Compliance

Are you compliant with the SOCI Act?

Cyber security and critical infrastructure law reforms under the Security of Critical Infrastructure (SOCI) Act recognise that a shared responsibility between the owners and operators of critical infrastructure and the relevant government bodies is required to effectively address cyber security threats.

There's no question that cyber threats to critical infrastructure are increasing in both frequency and sophistication. The SOCI Act works to strengthen the security and resilience of Australia's critical infrastructure assets through detailed positive security obligations that require entities to manage the security and resilience of their critical infrastructure assets.

Compliance with the SOCI Act is required by both the responsible entity, and all direct interest holders. There is now much greater responsibility and accountability placed on organisations and their directors to ensure the security of any critical infrastructure they're responsible for. Critically, this also applies to organisations in the supply chain which must also comply with the SOCI Act.

Maintaining compliance with the SOCI Act, as well as increasing cyber security and resilience, is now essential. Our robust Cyber Risk Program is designed to help organisations fulfil their requirements, including:

- ✔ Detailed asset discovery and identification
- ✔ Identifying relevant sub classes under the SOCI Act
- ✔ Robust incident response and reporting framework
- ✔ Cyber security exercises to build cyber preparedness
- ✔ Vulnerability assessments
- ✔ Annual report preparation

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We are a multi-disciplinary technology powerhouse, committed to keeping our customers secure and connected. We partner with our customers to boldly embrace the challenges of tomorrow, ignite innovation, and facilitate growth.

> Trusted Partner

Our customers don't just trust us to keep them productive and secure today, but to prepare them for what's next, to grow with them over time and to collaboratively shape their future.

> Strategic Advisor

With deep expertise in multiple facets of technology, our customers rely on us to provide them with strategic advice and guidance, helping them make smart moves towards a secure future.

> Solution Provider

Our versatile suite of skills enables us to tackle complex challenges for our customers, providing them with complete business solutions that draw from our vast pool of expertise and resources.

Take control of the future of your business.

We're Australia's leading platform-enabled, secure network and digital infrastructure provider. We're trusted by our clients to deliver the future now, transforming business and bringing people closer together.

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AUSTRALIA'S UPCOMING SIX CYBER SHIELDS CAN INSPIRE MINING COMPANIES TO SHORE UP THEIR DEFENCE.

As part of Australia's plan to build 'six cyber shields' by 2030, Home Affairs Minister Clare O'Neill has recently envisioned a world with clear global standards where cybersecurity is built in at the design stage for digital products like software. This doesn't come as a surprise as the number of common IT security vulnerabilities and exposures (CVEs) has recorded an all-time high for six consecutive years in 2023.

While the implementation of Australia's cyber shields will only be completed by the end of this decade, the mining industry faces an escalating cybersecurity challenge that demands immediate attention.

Recent reports have unveiled a worrisome trend that 71% of mining companies reported a surge in cyberattacks, while 55% of mining executives admitted to concerns about their ability to effectively manage these threats.

To address complex cybersecurity challenges, mining companies can get inspiration from the 'six cyber shields' to shore up their cyber resiliency.

1. Education: Cyberattack techniques

such as phishing leverage the fact that employees are the weakest link due to human error. Mining companies must prioritise employee education on cybersecurity as an informed and vigilant team can be the first line of defence in protecting sensitive data and company assets.

2. Safe technology: Regular scanning for software vulnerabilities and timely patching offer an additional layer of security. Use vulnerability and patch management to help you automate and streamline the process.

3. Threat sharing and threat blocking: Threat intelligence reports and feeds can help mining companies to stay ahead of adversaries by better anticipating the latest threats.

4. Critical infrastructure: The abundance of connected devices and smart industrial equipment means a larger attack surface that threat actors can use to gain access to your system and data. Use enterprise-grade solutions such as Extended Detection and Response (XDR) to uncover anomalous behaviour and breaches in your system.



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5. Cybersecurity capability: It takes large resources to build an internal team with all the necessary cybersecurity skills. Mining companies can benefit by enlisting the help of external security services experts, to help manage your company's cybersecurity.

6. Coordinated efforts through partnership: Consult your cybersecurity providers. Leading vendors like ESET can help your business to achieve all of the above,

including access to threat intelligence, XDR solutions, managed security services, vulnerability and patch management tools, and free cybersecurity training.

In the complex landscape of cybersecurity, external expertise plays a pivotal role in guiding the mining industry. By collaborating with external experts like ESET and their local partners, mining companies can fortify their cybersecurity defences at every level. **AMR**

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REDUCE UNPLANNED DOWNTIME WITH EFFECTIVE MAINTENANCE AND REPAIRS

Along with the right products, a proactive maintenance approach can keep your plant running more efficiently for longer periods of time.

Missing repair dates or scheduling maintenance too far apart can lead to breakdowns. Even the most seasoned and knowledgeable repair teams require the right materials to augment their maintenance processes.

Henkel's proactive maintenance solutions help find and solve problems before they lead to downtime and increased costs. As a leading industrial supplier, they have developed the LOCTITE® product line to pro-

vide the necessary materials to keep your facility in working order.

While downtime can cost an operation hundreds of thousands of dollars, with LOCTITE's industrial maintenance and repair services you can identify common pain points in advance, plan repairs around your schedule and avoid costly unplanned downtime.

Keep equipment operating efficiently and train teams to drive productivity with LOCTITE industrial maintenance support solutions, from industry-leading products to expert services and support.

Solutions that incorporate LOCTITE services, alongside adhesives, epoxies, sealants and coatings, can help a business develop a more proactive approach, reduce costly downtime, enhance the reliability of operations and lower overall operating costs.

Mines and Quarries

Mining equipment and machinery maintenance is essential in the demanding environment of mines and quarries with LOCTITE products proven to keep mining equipment in top operating condition, resulting in increased uptime and improved efficiency.

Henkel's mining equipment and machinery maintenance solutions include repair materials for conveyor belts, rubber liners, crushers, ball mills, chutes, elbows, pipes and ducts.

LOCTITE repair solutions don't require special skills or equipment to implement and can be performed by in-house maintenance teams.

Maintenance Reliability Solutions

Finding the right products for industri-



al maintenance and repairs is important and the LOCTITE line of industrial maintenance, repair, and operations (MRO) products provides you with the right solutions, however, effectively identifying problems and training staff to use the products is also important.

Henkel offers a number of industrial maintenance training programs, seminars and workshops that provide your team with the training and expertise needed to keep your industrial facility running smoothly.

These industrial maintenance training courses provide information on the various LOCTITE products used across different applications while providing in-depth instructions for the most up-to-date industrial maintenance approaches.

The Henkel team will survey the facility, provide hands-on training and identify areas for maintenance improvement and cost savings.

This includes industrial maintenance skills assessment so you can learn what training should be conducted.

Additionally, they provide an on-site maintenance reliability analysis that reviews and evaluates a facility's operational and maintenance profile and identifies inefficiencies and other challenges.



Plant Surveys

Henkel's plant surveys include a maintenance reliability analysis that helps uncover problems in your plant and allows you to identify on how to improve maintenance processes.

The team of MRO experts provide hands-on training for your team and identify areas for maintenance improvement and cost savings.

These plant surveys help identify and prevent the most common equipment failures such as shaft misalignment, vibrational loosening of fasteners, air and hydraulic leaks, spun bearings and keyway wallow, and gasket failure.

Maintenance Reliability Workshops

Henkel's on-site maintenance reliability workshops include seminars, courses and other trainings which can benefit both seasoned teams as well as new employees requiring more extensive training.

The aim of these workshops is to help identify the right products for each maintenance process or application whilst sharing expert knowledge of maintenance best practices.

These services help maintenance teams save time, reduce energy costs, improve safety and reduce fluid consumption. **AMR**



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Henkel



INDUCTION HEAT SYSTEMS FOR SAFER & FASTER HEATING

Feld Machine Tools carries a range of induction heating systems with digital recorders rental units suitable for pre-heating, post weld heat treatment, shrink fits, curing & coating, hot tapping and other custom applications.

Induction heating is a non-contact method of electronically heating conductive materials.

Utilising high frequency, alternating currents in coils creates a rapidly alternating magnetic field.

This magnetic field crosses the work-piece creating a current flow (eddy currents) within the part; heat is then generated due to the resistance to eddy current flow within the material.

Our Induction Heating Units have many applications and benefits over conventional resistance heating methods or propane.

- Our Induction Heating Equipment is safer, up to 20 times faster and more efficient.
- Materials are heated up very quickly. For example 24 Inch x 2.34 inch thick pipe material carbon steel can be preheated to 450F in 7.61 minutes.
- Simple, lightweight and user friendly.
- The Rapid Heat System can also be used for shrink fit of shafts and bearings up to 3 metres in diameter.
- Lower power consumption. In most

cases will operate from 30-amp 415-volt supply as opposed to 63-amp 415-volt supply required for resistance transformers.

- Digital recorder allows storage of all documents for downloading later on to a P.C. Saves time in retrieval and managing documents.
- Eliminates use of propane which creates uneven temperature transfer. In addition, every kilo of gas burned creates three kilos of water – a problem when welding.

The key safety benefits are:

- Our heating cables remain cool to the touch while the material heats from within, making welders work more comfortable and efficient, allowing for reduction in welding times.
- Very little reflected heat.
- No naked flames or exposed elements.

The Rapid Heat 35 is designed to replace open-flame or resistance heating.

- Outperforms propane or radiant heating in efficiency, ease of use and heating uniformity.
- Simple interface can be learned in a matter of minutes and provides operator tutoring.
- Can be used as an air-cooled or liquid-cooled system.
- Easily connected to a range of heating

elements.

- Can be used with or without a temperature recorder.

The Rapid Heat 35 System has a choice of four programmes: Pre-Heat, Bake-Out, P.W.H.T. and Custom. In the programme, you can set the target temperature, soak time/temperature, cool down temperature/rate deg/hr, ramp rate deg/hr, etc. The Rapid 35 controller will then monitor the attached thermocouples to ensure that the heating and cooling rates are not violated during the procedure.

Liquid-cooled heating cables can provide uniform heating up to 788°C (1450°F). They are ideal for both pre-heat and PWHT needs, including Stress Relieving, Hydrogen Bake-Out, Shrink Fitting and many other applications.

Our liquid cooled heating cables come in sizes 30ft, 50ft, 80ft and 140ft. The silicone cable encloses a special copper conductor specifically designed for carrying high-frequency current to maximise efficiency. The cable also carries the coolant, which cools the conducting wire. The cable is reinforced for strength and durability they are reusable and easily installed in a matter of seconds.

The digital recorder is commonly used in stress relieving and critical preheat applications, however, can be used in any process. The recorder stores temperature data based on time.

The Rapid Recorder offers unrivalled input accuracy with a 125ms total sample rate for 18 channels. The input channels are configurable to suite the process requirements. It has a touch screen display for simple programming and use.

The colour display enables operators to clearly monitor the heating process in outdoor environment (direct sunlight).

They all have onboard Flash data storage capability, Ethernet communication and Compact Flash. Data is stored in tamper resistance binary format that can be used for secure, long-term records of the process.

Some of our more common applications are:

- Pre and Post Weld Heat Treatment
- Hydrogen Bake Out
- Stress Relieving
- Structural Steel
- Flat Plates
- Vessels
- Fabrication
- Coatings
- Unfreezing Pipelines
- Trace Heating

Due to the flexibility of our systems, we can adapt our equipment to almost any heat treatment requirements. Our induction heating coils are easily wrapped around various shapes and sizes of components. **AMR**

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LOCKOUT / TAGOUT EQUIPMENT

TAGS AND HOLDERS

TAGS

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- Out of Service tags - are used when equipment is faulty

TAG HOLDERS

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(L-R) Raphael De Simoni, Conveying Solutions Consultant; Adam Cornelius, Head of the Conveying Solutions HUB; Karen Meagher, Decarbonisation Advisor.

HIGH TECH CONVEYING SOLUTIONS, HIGH IN THE SKY

A unique new, high technology “HUB” office on the 26th floor of one of Perth’s most iconic skyscrapers has been designed to assist mining companies better plan their future conveying requirements by presenting the latest global innovations in conveying.



Adam Cornelius discusses various conveying system options with a mining engineer for a new iron ore mine soon to be constructed in WA’s Pilbara.

In what is claimed to be a world first, the Continental Conveying Solutions (CCS) HUB will showcase the company’s global innovations and conveying capabilities to the mining and minerals processing sector.

No expense has been spared in ensuring the technology, interior design and functionality of this new HUB office supports its objective of presenting cutting-edge conveyor technologies used all over the world.

It boasts state-of-the-art digital technology so clients, Continental staff from all over the globe, and other visitors can connect together in real time to discuss, collaborate and explore a superior economic, sustainable, efficient conveying environment.

There are many dynamic screens and devices, and private and open areas to sit, meet and discuss the latest projects whilst enjoying the breathtaking views over the Perth CBD, the Swan River, and Kings Park.

The intention here is to encourage creativity and imaginative thinking.

CCS’s HUB is the brainchild of Adam Cornelius. His background is in building relationships and developing strategies with executives in Melbourne and Sydney, to securing construction work at Perth’s new Stadium Rail and Lithium Refineries in Kwinana.

KEY THEMES AND EXPERTS

Adam said there is a clear focus on Digital, Decarbonisation and Services themes. He sees an increased need for delivering faster solutions, and the re-use and recycling of materials as the HUB helps miners operate more efficiently in a safer environment.

Service Solutions

“In Service Solutions we’re concentrating on three major areas. Heavy equipment and belt handling systems; breakthrough methodology in conveyor changeouts; and accessories and components” he said.

“We have appointed Raphael De Simoni, as our Conveying Solutions Consultant. He brings over 20 years of experience across the whole spectrum of the conveyor value

chain, from planning and commissioning to technical advice, training, digital monitoring, and on-site maintenance.

“With his work on the ground in South America with Vale and BHP, he’s looking forward to informing, engaging and collaborating with miners on the best site-specific fit for their conveying operational requirements” he said.

Decarbonisation

“Showing true accountability, mining players of all sizes have committed to net zero emissions goals to meet the pressing 2050 climate change target, so we need to be leaner, cleaner and greener to collectively manage Scope 1, 2 and 3 emissions” he added.

“To head up this section, we have appointed Karen Meagher as our Decarbonisation Advisor. Karen has joined us after several years working in environmental accounting, technical and research roles, supported by a strong academic background having recently completed a Master of Environmental Science and a bachelor’s degree in both Science and Commerce at UWA” he said.

As an example of this commitment, CCS claims its new energy-optimized conveyor belts can save over 3,000kW of input power on a 5km conveyor system. The amount of energy saved over a period of 1.5 hours is equivalent to the consumption of an average 4-person household during an entire year.

Digital

Digitalisation is now critical across the

whole value chain as mines seek to become more operationally productive, with cross functional engagement, safely with the ability to work remotely and autonomously.

“We are developing digital solutions to assist in preventive maintenance and condition monitoring, he said.

“Tara Bennett-Connell has joined us as Product Manager, Digital Solutions (IAPAC). She has over 29 years’ experience in the mining and metals industry, starting as a geologist, moving through to data, digital product management and digital innovation in mining and exploration” he commented.

One example of digital innovation is Continental’s Drone-assisted conveyor monitoring solution.

This is significantly more functional in preventive maintenance and condition monitoring, as their leading data analytics and algorithms result in a vast improvement with idler monitoring and trend analysis.

“I like to think of the CCS Hub as a bit like connecting all the dots,” he commented. “Sharing tomorrow’s methodology all in the one place, today.” **AMR**



One of the displays at the CCS HUB is this Conveyor Monitoring Solution. Assisted by a drone equipped with infrared and RGB cameras a conveyor can easily be inspected using pre-programmed flight routines.



POLYTEX
Protecting Australian Produce



Stockpile covers, bunker covers and shelter covers

Polytex protects a vast range of produce from nickel ore in the **Solomon Islands**, coal dust in central **Queensland**, bentonite in **Victoria**, suppressing dust in **New South Wales**, and replacing large wind-damaged shelter covers in **Western Australia**, just to name a few applications. Polytex is a respected and reputable supplier of **stockpile covers, bunker covers and shelter covers** Australian wide and beyond.

In the dynamic world of mining, where every operation strives to optimize productivity and efficiency, the importance of proper material management

cannot be overstated. With over 50 years experience in the industry, Polytex has been at the forefront of providing innovative solutions to mining companies Australia wide.

Our stockpile covers and shelter covers are an important part of the way mining companies manage their resources, offering a multitude of uses and benefits that enhance operations and environmental sustainability.

Protecting Your Valuable Resources

Mining companies deal with an array of materials, from ore to aggregates, that must be stored and protected from the elements. Our stockpile covers and tarpaulins serve as reliable shields against rain, wind, UV rays, and other

environmental factors that can deteriorate the quality of stored materials. By preventing moisture ingress and dust dispersion, Polytex covers ensure that your stockpile remains protected.

Shelter Covers

The name Polytex has gained momentum for its ability to provide in-house custom designed Shelter Covers.

Polytex innovation in covers has allowed installers to cut down their install times and provide easier tensioning of covers. The secret to success and durability of covers is the way they are tensioned. Polytex has worked alongside many of their long time partners in the industry to continually innovate and manufacture leading techniques

to ensure the ultimate protection of your investment.

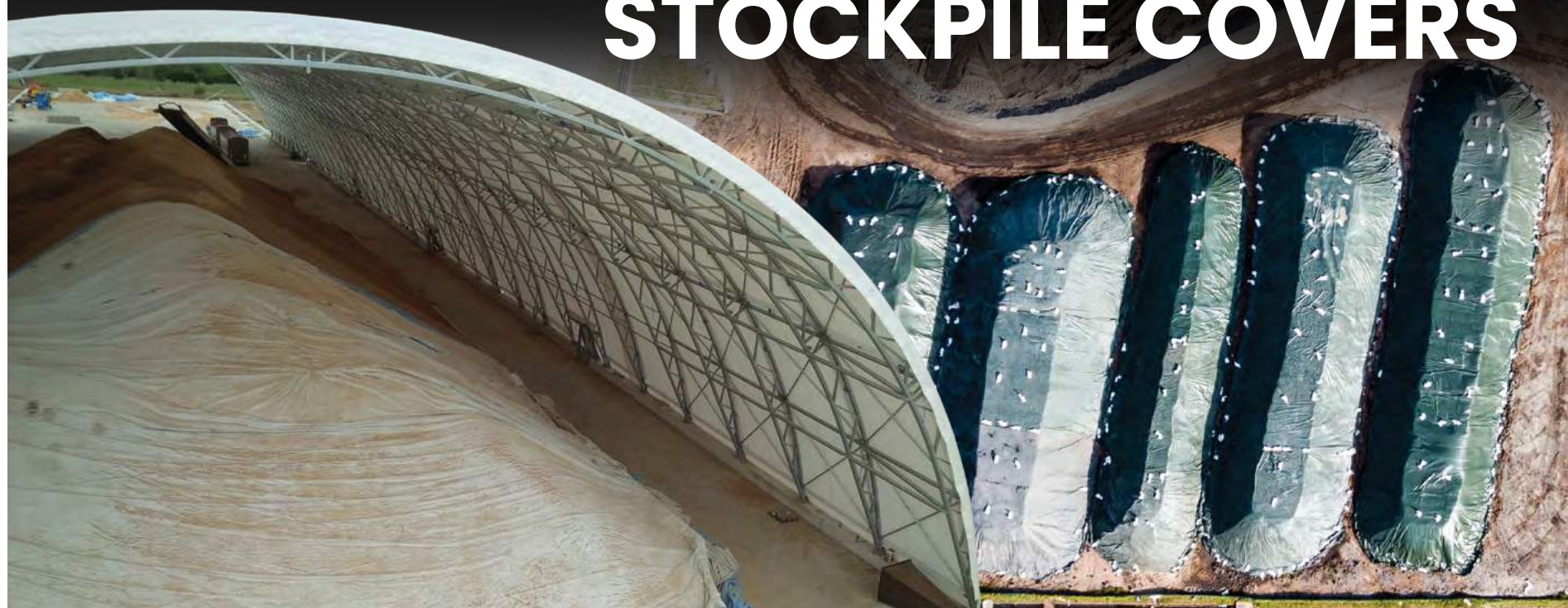
Customized Solutions

At Polytex, we understand that every mining operation is unique. That's why we offer customized solutions to meet your specific needs. Our team works closely with you to design and manufacture stockpile covers and tarpaulins tailored to your materials, storage methods, and site conditions.

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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.

Morgan 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/ to find out more.

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MORGAN ENGINEERING

EXPERIENCE. QUALITY. RELIABILITY.

Since 1975, Morgan Engineering has been focused on delivering state-of-the-art capabilities with advanced equipment, providing clients with tailored solutions.

Machines might make light of the toughest work, but they also require regular repairs and maintenance to keep them operating shift after shift.

We have developed our own proprietary equipment and techniques to machine steer box tapers in-situ - eliminating the entire removal and offsite repair process, and substantially reducing equipment downtime.

Our team can carry out this work on any Australian site, completing the repair in only 12-14 hours as opposed to three or four days, and at approximately 60% of the cost of replacement parts.

**OUR INNOVATIVE
SOLUTION WILL REDUCE
DOWNTIME, WHILE
SAVING YOU MONEY!**



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02 6572 2032

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ZOOMING OUT: A PROVEN STRATEGY FOR SUCCESSFUL PROJECT DELIVERY

Innovative solutions grounded in real-world experience are the best approach to conquering the complex challenges facing the mining industry today, according to leading engineering services company, Mipac.

Over three decades and with 650 projects under their belt, the company has tried and tested solutions to complex problems across the entire mining value chain, from the design and commissioning stages of a project right through to configuration and optimisation.

Their preferred approach? Zooming out. Identifying bottlenecks and interdependencies. Examining the whole mining value chain and every layer of the automation pyramid to discover hidden opportunities to increase productivity, efficiency and reliability of the system.

It's a strategy the company has been applying since its humble beginnings in Queensland, when a small group of ambitious engineers at MIM Holdings saw a gap in the engineering services industry and jumped in the deep end.



And it's a strategy that's paid off: today, the company boasts a team of 120+ electrical, instrumentation, control system, process and software engineers with in-depth site experience from 100+ mine sites in over 50 countries.

There are other reasons the company prefers to take a whole-of-value-chain approach:

1. Today's challenges are not tomorrow's challenges.

Since 2007, Ernst and Young has been compiling a list of the top 10 business risks and opportunities facing the mining and minerals sector. Cost reduction considerations, consolidation and capital management prefaced resource nationalism, global skills shortages and a tightening economy. More recently, rising inflation, digital transformation and ESG issues have been at the fore.

Certainly, the mining and minerals sector of today is not what it was in 2007 – and nor are its challenges. Mipac is a firm believer that to remain competitive, companies must continue to adapt, reevaluate



priorities and innovate. That's why the company is quick to adopt new technologies, applying them to projects wherever feasible to ensure that the solutions they provide are sustainable and beneficial in the industry of the future.

2. The workforce continues to change.

Mining operations require a highly skilled and specialised workforce, encompassing geologists, engineers, equipment operators, safety experts, logistics professionals, metallurgists, maintenance staff and many more. Finding and retaining this talent pool is a constant struggle, as the industry faces competition from other sectors offering more attractive work environments or compensation.

On top of this, mining operations are frequently located in remote areas, making recruitment and retention even more challenging. Safety concerns and the physical demands of mining work also contribute to a higher turnover rate. Finally, as the industry modernises and embraces automation and digital technologies, there is a growing need for workers to upskill, which can be a costly exercise for operations.

Mipac's approach is to co-develop solutions with its clients to ensure front-line operators and staff not only understand but take ownership of any changes implemented. Working both onsite and remotely, Mipac has the capability to deliver high quality solutions, no matter where your operation. The company also offers customisable, on-demand eLearning solutions to address the challenges of upskilling remote and diverse teams.

3. There is no 'one size fits all' approach.

From greenfield to brownfield, large to small, every mine site comes with its unique set of challenges – and opportunities.

Thanks to its engineers' wealth of onsite experience and deep technical knowledge, a Mipac project will often deliver well beyond the required solution, increasing efficiencies, reducing variability, minimising downtime, decreasing risks, improving reliability and leading to gains in productivity and quality.

From control systems with robust technology and engineering foundations to the latest innovative advancements in digital technology, Mipac delivers high-quality, intelligent solutions that drive performance, no matter your site, location or challenge.

In summary, the complexity of today's mining industry challenges demands innovative solutions. It is not enough to look at cost management, productivity or sustainability challenges in isolation. Rather, a whole of mining value chain approach can help to identify interdependencies, bottlenecks and hidden opportunities.

And whilst in some ways, it is understandable that companies focus on addressing individual problems – as these provide quick wins, easy board and shareholder approval and quick returns on investment – zooming out may be the solution to not only surviving but thriving in the mining industry of tomorrow.

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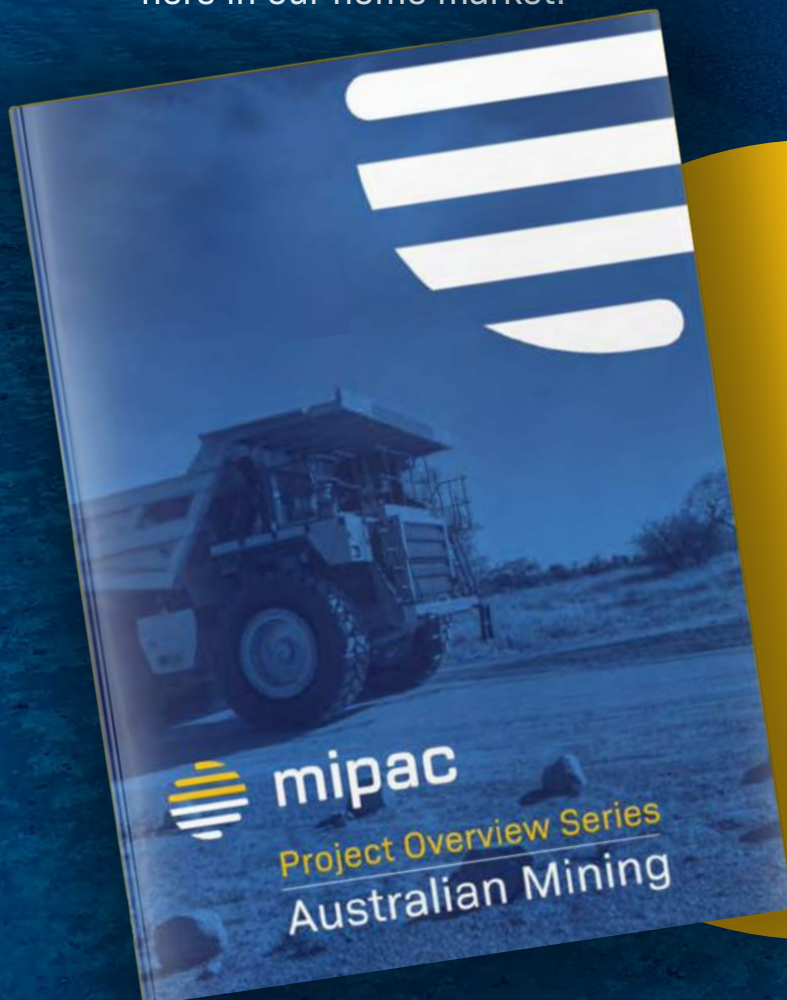
Unlocking operational excellence across Australian mines

At Mipac, our experienced engineers pride themselves on solving the impossible.

We've been helping Australian mining operations increase productivity, reduce costs and optimise performance across the entire mining value chain for more than 26 years.

Download our latest profile pack to see the challenges presented and solutions delivered here in our home market.

Get our
Australian
Mining
Profile
Pack here



beyond the solution

A global leader in operational technology, control systems and engineering services across the mining value chain

650 projects delivered
100 clients globally
50 countries
26 years in business

Mipac Services

Industrial Automation
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Advanced Process Control
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Cyber Security
Mining 4.0 Consulting
Process Optimisation
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MPA and TCard™

Mipac Products

CellView®,
ShortMeter™
CopperMonitor™

CMI RESTRAINED MK II UPGRADE NEW STAINLESS-STEEL RESTRAINED MK II SERIES



CMI Electrical products are an Australian manufacturer of mining couplers and receptacles, under the Minto Industrial Products banner.

Minto a market leader, particularly within underground mining, our reputation is not only throughout Australia, but is now global with exports to mining installations in Indonesia, Papua New Guinea, China, South Africa and Mongolia to name a few.

CMI latest development is an improvement and major upgrade for the popular "Restrained" Range of couplers.

The Restrained couplers works in the

range of 300 & 425 Amps for 660, 1100 or 3300 Volts.

Now designed with Stainless-Steel castings for improved strength and reduced weight over the previous bronze castings.

Coupled with the newly redesigned Stainless-Steel interior cradle, which holds the teflon insulators and the socket & thimble arrangements for connection to reeling and trailing cables.

The result is a more robust coupler with improved maintenance features, safe for use in underground mining.

This product can be used in hard rock

mining and tunnel applications as well and has an explosion protected certification making it extremely suitable for use in underground mining applications. The new low-profile exterior design maintains greater strength and durability with an ingress protection of IP68.

The new Stainless-Steel interior replaces the existing Dough Mould Compound (DMC) material.

The Teflon insulators and the two-piece Stainless Steel cradle being far more durable, reliable and reduces the overall weight of the coupler.

The Stainless-Steel interior allows for

easier access to sockets with a two-piece design capturing the teflon insulators for ease of removal and replacement.

For more information on this product, you can get in touch with CMI on 1800 264 222, or go to their website at <https://www.cmielectrical.com.au>

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Specialists in Electrical Cable & Mining Connectors

Expertise and Precision is our purpose.

CMI Electrical Products are specialists in the manufacture and distribution of electrical cables and associated components for industrial, mining, infrastructure, commercial, petrochemical and information technology applications throughout South East Asia and Oceania.

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1800 264 222
[cmielectrical.com.au](https://www.cmielectrical.com.au)



THE CABLE MANAGEMENT SPECIALISTS



No matter the industry, whether you are connecting a site with high-speed internet, powering communications networks, or simply charging an endless number of electronic devices, cabling is virtually a necessity.

For over two decades, one specialist cable management company has met the increasing demand for technology required in residential and commercial automation.

Cable Source offers a comprehensive range of cable solutions, supplying products for electrical, data, CCTV, security, fibre and industrial applications.

Backed by a team of highly skilled technicians with more than 20 years' experience, Cable Source is committed to delivering projects from conceptualisation to completion, selecting the right products for the right job.

In the mineral resources sector, its fit-for-purpose range of cables continues to gain popularity with Australian service contractors, supporting multiple electrical, data,

communication and security applications. Cable Source Director Craig Turner said the company offered a superior service in the design of cable management solutions as well as installation and ongoing maintenance programs.

"Our customers can secure everything electrical, whether it's cables, communication equipment, cabinets and racks, fibre optic gear, or networking supplies, Industrial and commercial UPS systems, tools and accessories," Mr Turner said.

"We have an in-depth understanding of how the mining industry works and what sites need when it comes to their electrical requirements. Our cable management solutions reflect this, that's why we're capable of handling design, installation and ongoing maintenance programs in this space."

One of the company's most sought after solutions across mine sites is their communication cabinets and racks, which are used to safely house cables and other equipment. As projects are commonly lo-

cated in harsh environments, the need for durable products is critical.

One notable cabinet solution is the stainless steel enclosure that can be floor-mounted or pad-mounted on a site.

"The cabinet is mainly used in security and transportation signalling fields to install power, electronic control and fibre optic equipment," Mr Turner said.

"The cabinet can be used to install panel-mounted power, optical transceiver and other panel or DIN rail mounted equipment, such as ADSL modem, streetlight controllers.

"The cabinet is designed for applications where the enclosure has a high level of exposure to solar radiation.

"The fitted sunshades maximise air circulation to ensure natural temperature regulation of internal equipment," Mr Turner said.

Another popular Cable Source solution is the aircon enclosure cabinet, a product

that is primarily utilised by operators in wireless communication projects when installing power, battery, BBU and other 19-inch equipment. The cabinets serve multiple purposes and are typically deployed under telecommunication towers, building roofs and roadsides.

"This spans an FTTB application, or it can be used to install and protect DSLAM, or optical transmission equipment," Mr Turner said.

"What's really unique about this cabinet is that the air-con is fitted to it, supplying 600W - 1500W cooling capacity. It's also built to last, with mild steel, static powder coating, insulation to sides and doors as well as a waterproof design for harsh environments.

"The solution also boasts reliable earthing and cable glands to prevent moisture and insects from entering."

For more information, visit
www.cablesource.com.au

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Cable Source Pty Ltd

INDUSTRIAL CABLING, FIBRE OPTIC & IT SUPPLIERS

Established in 2005, Cable Source are the one-stop-shop when it comes to your cabling needs. Backed by a team with more than 20 years of experience in the trade, Cable Source supply products for a range of electrical, data, communication and security applications. From project concept to completion, you can count on Cable Source to deliver the right electrical product for the right job.

- Mining Cables, Field PROFINET / Bus, Ethernet, Chain, Robotic control and power
- Cable Assemblies
- Fibre Optics
- Industrial Pre-Terminated Fibre, Weatherproof Connectors
- Comms Cabinets and Racks
- Networking Switches
- Industrial Outdoor Enclosures
- Tools
- UPS Systems, Din Mount Power Supplies
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Local lighting expertise, with global support.

The right light not only enhances visibility and safety but also increases productivity and efficiency in mining operations.

With beginnings as a manufacturer of lighting for piers and jetties, Pierlite has grown within Australia and New Zealand to be a true market leader in the industrial space, supporting the industry for over 70 years.

Choose Pierlite.



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MINEMASTER SB

CONVEYOR AREA LIGHT

Introducing the NEW MineMaster SB, a conveyor area light designed and developed in Australia for tough aussie conditions. Providing energy savings and a reduction of on-site maintenance costs for the mining industry.

Tested for rough service and adverse locations

Emergency option with DALI/self testing function and Lithium Iron Phosphate battery

Supplied with 4m 1KV HD UV resistant cable for ease of installation

Optional surface mount kit and onsite replaceable gear trays

Self-cleaning design with bird proof clips

Replace control gear for onsite upgrades and maintance

Fast and easy installation reducing installation cost

For more information, visit our website at pierlite.com.au

CODE	DESCRIPTION
MRASLSD4T24	MINEMASTER LUMEN SELECT DALI 4K T2 OPTIC
MRASLSD4T54	MINEMASTER LUMEN SELECT DALI 4K T5 OPTIC
MRASLSDAT24	MINEMASTER LUMEN SELECT DALI AMBER T2 OPTIC
MRASLSD4M2T24	MINEMASTER LUMEN SELECT DALI 4K MAINTAINED EMERGENCY T2 OPTIC
MRASLSD4M2T54	MINEMASTER LUMEN SELECT DALI 4K MAINTAINED EMERGENCY T5 OPTIC
MRASLSDAM2T24	MINEMASTER LUMEN SELECT DALI AMBER MAINTAINED EMERGENCY T2 OPTIC



IK10
Impact
Rating



IP66
Ingress
Protection
Rating



Lifetime
Rated
>84,000hrs
(L70/B10)
Rated
>53,000hrs
(L90/B10)



Ta 50°C
Operational
Temperature
Rating



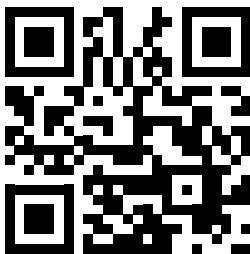
5 Year
Warranty



10kV
Surge
Protection



29W - 70W
Wattage

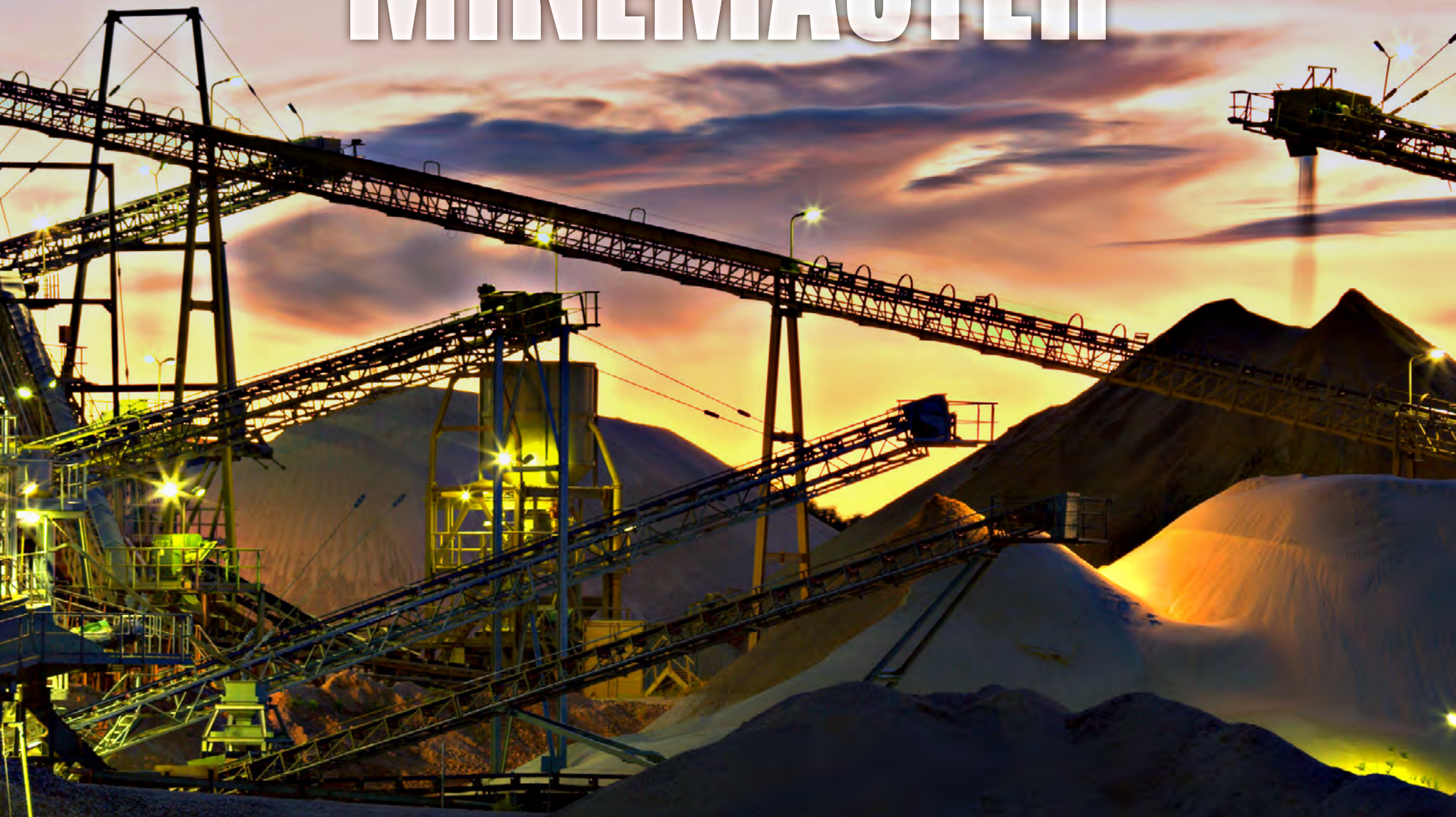


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LIGHTING THE WAY WITH MINEMASTER



As the rise of new technology boosts industry competitiveness, the need to incorporate smart, inventive lighting solutions that help drive innovation, productivity, safety and positive environmental impact is more important than ever.

With a history spanning 70 years, Pierlite is recognised as a market leader in Australasia for the design, manufacture and distribution of mining, industrial, commercial and healthcare lighting systems.

Tailoring a lighting solution to meet industry standards across safety and sustainability is paramount, as is taking the time to understand individual site needs. Effective use of light throughout a facility can also actively enhance operational output.

In the majority of cases, the loss of productivity can be attributed to human factors, whether it be errors made in operating machinery, mistakes made in production or absenteeism due to fatigue or sickness.

"Pierlite's history is synonymous with the evolution of the lighting industry. We have a continuing legacy of developing innovative products for Australian and New Zealand environments, creating and rigorously testing products to ensure they exceed

the needs of our customers. As a brand of Signify, the world leader in lighting, we have decades of experience built into every new product development, with a focus on safety and reliability at our core," Signify Pacific General Manager Wholesale Australia Andrew Smyth said.

MineMaster SB

Pierlite's new product, the MineMaster SB, is an Australian developed conveyor light built to withstand the harshest of conditions. It provides versatility with spigot or bulkhead mounting options and high-quality light for all applications. Supplied with lumen select technology, it's ideal for sites with a requirement for singular or multiple lumen outputs.

Features include:

- Multiple wattages and lumen outputs in one luminaire with a maximum of 70W
- Amber with T2 Optics. 4000K with T2 or T5 optics provide 0.2% maximum upward light
- Diecast marine grade aluminium housing with chromate and RAL9007 powder coat finish with 27mm to 34mmØ spigot mount
- 316 stainless steel clips secured with T25 torx screws making it bird proof
- 6mm² terminal block, 10KV surge

protection and fuse supplied as standard with 4m 1KV orange circular UV rated flexible cable

- Replaceable control gear trays available for onsite repairs and quick maintenance
- Bulkhead kit with eight cable entries, 10KV surge protection, fuse and 6mm² terminal block
- Emergency version available ensuring compliance to safety standards

The light provides energy saving, increased spacing and reduced maintenance costs across the mining industry.

"The MineMaster SB was designed here in Australia to cope with Australian conditions. We worked with key mining site personnel to determine what was important and ensured the fitting delivered the unique features that are critical in this type of environment, for functionality and safety," Signify Pacific Senior Category Manager — Heavy Industrial, Custodial, Solar and Floodlights — Jason Watkins said.

Mine Light Benefits

The World Green Building Council (WorldGBC) has published studies which highlight the benefits of exposure to daylight, which includes improved health and better sleep.

When people are rested, they are more alert throughout the day and have better emotional and physical health. This reduces incidences and errors, directly translating to increased productivity.

Where access to natural daylight is not possible — such as underground mines, in sealed spaces or during night shift — artificial lighting is used to simulate natural daylight.

Pierlite's products integrate the latest technology and systems to deliver energy-efficient solutions that can adapt to the needs of each industrial segment, application and the people within them.

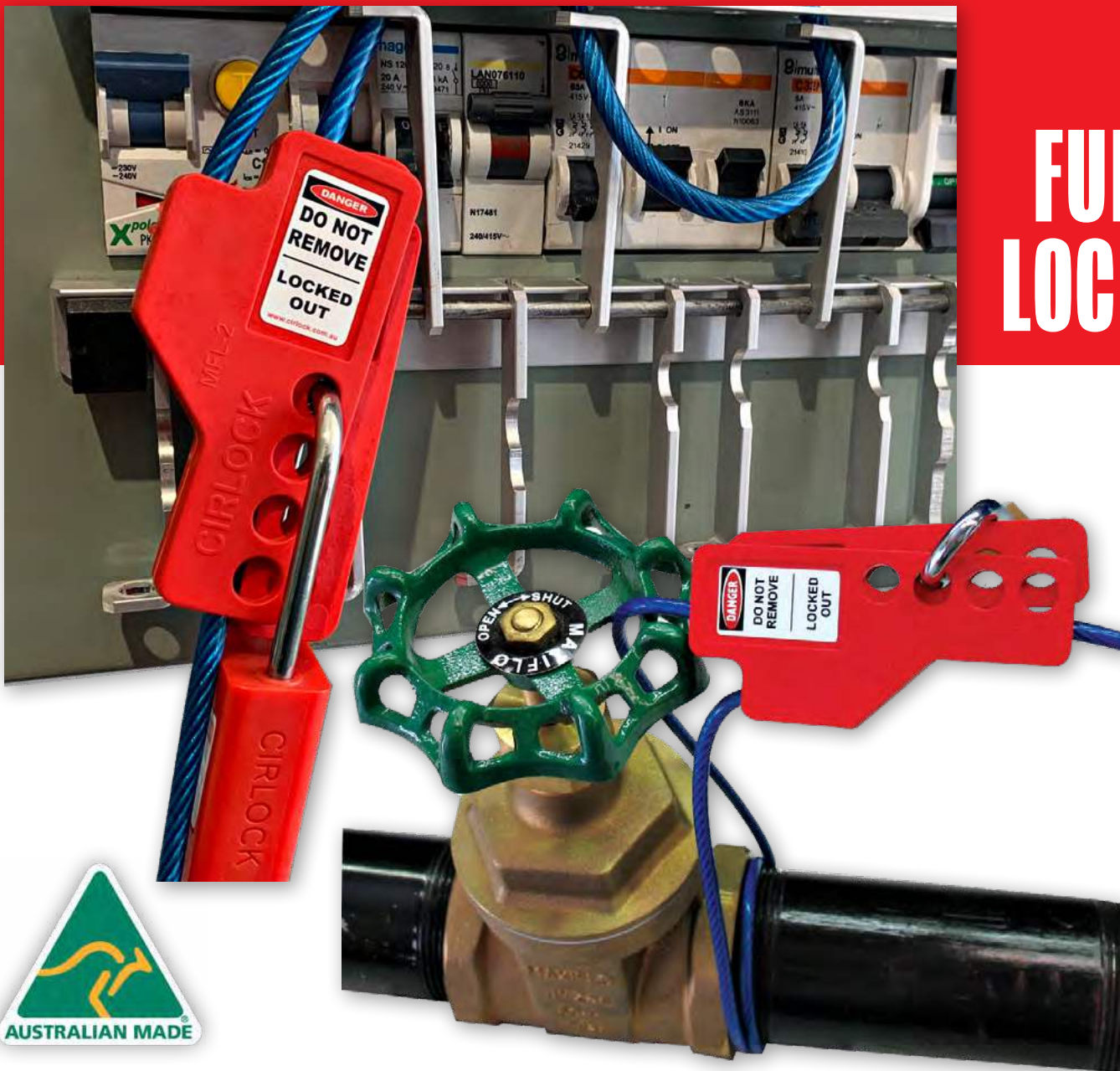
Combining the latest technology with innovative thinking, Pierlite harnesses the power of natural light with solutions that adapt to future technologies, promote mental and physical wellbeing, and improve sustainability and efficiency.

For more information,
visit www.pierlite.com.au or
call 1300 799 300.

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MFL-2 MULTI FUNCTION CABLE LOCKOUT DEVICES



The MFL-2 Multi Function Cable Lockout Devices from Cirlock are versatile devices which can be used to lock out several different energy sources, including valves and steering wheels on vehicles.

They can also be used to limit the number of padlocks needed on a job as the cable can be fed through several lockout devices on one electrical board, with 1 padlock applied. The flexible cable is also handy for those tight situations where a hasp won't fit, and group isolation is required. Accommodates up to four padlocks.

The Cable Lockouts are available as standard with one or two metre cables, and are available with a steel wire cable, or a non-conductive plastics cable, for use where metal cannot be used (eg electrical cabinets). Additional cables can be supplied in various lengths, making these devices suitable in many situations.

Proudly Made in Australia by Cirlock and sold at your local electrical wholesaler.
<https://www.cirlock.com.au/products-shopping/Cable-Lockout-Device-5mm-Steel-Wire-Cable-p109853486>

CIRLOCK LOCKOUT / TAGOUT EQUIPMENT

LOCKOUT EQUIPMENT

GROUP LOCK BOXES

When multiple people need to work on the same equipment, a Group Isolation Box is often used. The equipment is Locked Out by a maintenance padlock (or a supervisors padlock), the key is placed inside the Group Isolation Box and all workers place their keys on the outside of the box preventing access to the Equipment Key until all work is complete. It keeps each team member safe and also eliminates the need for multiple padlocks on individual isolation points.

LOCKOUT PADLOCKS

Cirlock's Lockout Tagout Padlocks come in 8 different colours, with various shackle sizes and shackle types (Non-Conductive and Stainless Steel) and can be keyed differently, keyed alike or master keyed, to suit your requirements.

Cirlock Padlocks are available for immediate dispatch.



See our full range on our website: www.cirlock.com.au
lockout@cirlock.com.au | 1300 889 738



NO REST FOR MELVELLE WITH NEW PRODUCTS AND DISTRIBUTORSHIPS.

With more than 250 products in its range, second generation Australian-owned family business Melville Equipment doesn't rest with new products being prototyped, tested, trialled and released as part of a continuous development program.

Its design and manufacturing facility - located in Newcastle, NSW - is fully self-sufficient with modern numerically controlled computer and manual machinery.

With a world focus on green technology, Melville Equipment are focusing on battery powered equipment to meet emissions targets.

Battery Inspection / Emergency Response Trolley

With a payload of up to 700kg, the Battery Operated Inspection / Emergency Response Trolley has a range of up to 70km and a top speed of 10km/hr. When using two batteries usage is four hours and is doubled to eight hours when using four batteries.

The maximum payload for the emergency response deck is 550kg while the maximum payload is 75kg per deck extension.

Furthermore, the 1920045 Stowage Unit allows the emergency response trolley to be loaded into an elevator or onto a ute tray.



Battery Track Pack System

The Battery Trackpack can be paired with any of Melville's Hydraulic Trackpack work heads, namely the E-Clipper (insert and remover), E-Clip Remover (frozen e-clip remover), EYE E-Clip Remover (broken E-Clip remover), Fast Clipper (insert and remover), Spike Puller (lock and dog), Spike Driver, Screw Spike (insert and remover) and Wood Borer.

It produces no emissions and minimal heat, has low noise and vibration, effortless control, it's easy to transport and it only uses energy when required.

As there's no engine, there's no engine oil, oil filter, fuel filter, air filter or spark plugs, the self-diagnostic control display shows issues with the machine and battery load testing is recommended every six months, or sooner in heavy use.

NEW DISTRIBUTED PRODUCTS FOR THE AUSTRALIAN MARKET

Interflon

Rail operators looking to improve reliability, maintenance practices, fatigued component inspection, the life of fixed assets, and operational costs should consider lubrication as a key part of the solution. Rail operators spend billions annually to maintain and improve their infrastructure in all-weather climates. On-time train journeys are essential to avoid financial penalties, delays, and dissatisfied passengers.

Interflon offers revolutionary lubrication and coatings solutions that ensure reliable operation of rail rolling stock and infrastructure, while reducing operational costs through extended maintenance intervals and reduced wear. This is also possible with a reduced inventory of specially developed all-season products for all applications in all weather.

The lubrication solutions meet the needs for light rail, metro, passenger, freight, and high-speed rail travel. Thousands of rail networks and rolling stock equipment all over the world operate more reliably and efficiently

thanks to Interflon. They have become a trusted partner to satisfied customers in the railway industry all over the world.

ZÖLLNER

Founded in Germany in 1946, ZÖLLNER Signal GmbH have been providing new safety solutions for the rail and marine industries for over 75 years. As one of the world's leading suppliers of automatic track warning systems, know your workers are in safe hands.

Used on hundreds of worksites across the globe, mobile radio warning systems (MRWS) are used to protect workers in track areas from approaching trains. All components in the MRWS family are modular and designed to be used in multiple safety configurations. This flexibility makes it possible to provide the best track safety solution for every worksite.

The way it works is when a track vehicle approaches a worksite protected by a MRWS, the Autoprowa system warns people in the area with a warning signal that has been automatically adjusted to suit to ambient noise level. Warning lights remain on until the hazard has been cleared from the system.

Contrail Machinery

Contrail Machinery offers a wide range of flash-butt welding machines which are manufactured to the highest quality standards and adapted to the needs and specifications of each project.

Its products include the CR65, the CR100 and the CRP160 welding systems. The CR65 and CR100 systems can flash-butt weld rails with cross-sectional areas of 5.000mm² to 12.000mm², while the CRP160 system can provide a pulling force of up to 140 tonnes.

ELPA

The rail lubrication technology is a combination of applied materials and devices that can adapt to different pressures, frictions and temperatures in the microenvironment of the wheel-rail interface.



The WONROS technology has a consistent and proven track record of efficient railway friction noise elimination (up to 99.9% reduction) and has exhibited a 100% success rate in resolving friction noise on all noise hot spots where other technologies have failed.

Light Boy

Lightweight, glare-free and able to provide 360-degree illumination, the Balloon Light by Light Boy is ideal for use in maintenance, construction, events, traffic control and emergencies — just to name a few. It comes in a 300W or 800W LED version and can be mounted to either a stand, post or cart.

The 300W LED version can be powered from battery cells for up to 12 hours depending on the battery capacity coupled with the light. These lights have been proven to be brighter and more efficient than other battery light solutions currently available in Australia.

Rail Products UK

Rail Products UK has developed their new 450HVM Mobile Elevated Work Platform for the rail industry. The Hybrid MEWP with Stage V Technology will operate autonomously for up to 50 hours work (in default conditions and 840Ah battery).

Key new features of the new MEWP include integrated control panel with dynamic visual display, 450kg basket, continuous 360 degree rotation, 16.68m max working height and new PA64 pantograph able to measure from 4.2m – 6.4m while driving).

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For more information and to find out more, email sales@melville.com.au or call 02 4951 5244.



Manufacturing and Supplying Rail Track Maintenance Equipment Since 1982

Melville Equipment is continuously prototyping, testing, trialling and releasing new products as part of its development program.

New distributorships include:

- Interflon
- ZÖLLNER
- Contrail Machinery
- ELPA
- Light Boy
- Rail Products UK

Focussing on battery powered equipment to meet emissions targets.



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W: melville.com.au



MOXI AND MARTEQ

Long 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 modelling,

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, 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
•Inspections •Consulting •Training

Marteq Energy

WHAT MAKES AN EEHA DOSSIER?



EEHA DOSSIER

CLASSIFICATION REPORT

MAINTENANCE MANAGEMENT PLAN

MANUFACTURERS
DOCUMENTATION

CERTIFICATES OF
COMPLIANCE

HA CLASSIFICATION
DRAWINGS

EQUIPMENT
SCHEDULES

CABLE SCHEDULES

P & ID DRAWINGS

INTRINSICALLY
SAFE
CALCULATIONS

ELECTRICAL DRAWINGS

DOCUMENTARY RECORDS

INITIAL DETAIL
INSPECTION ITRs

HISTORICAL
INSPECTION
RECORD ITRs

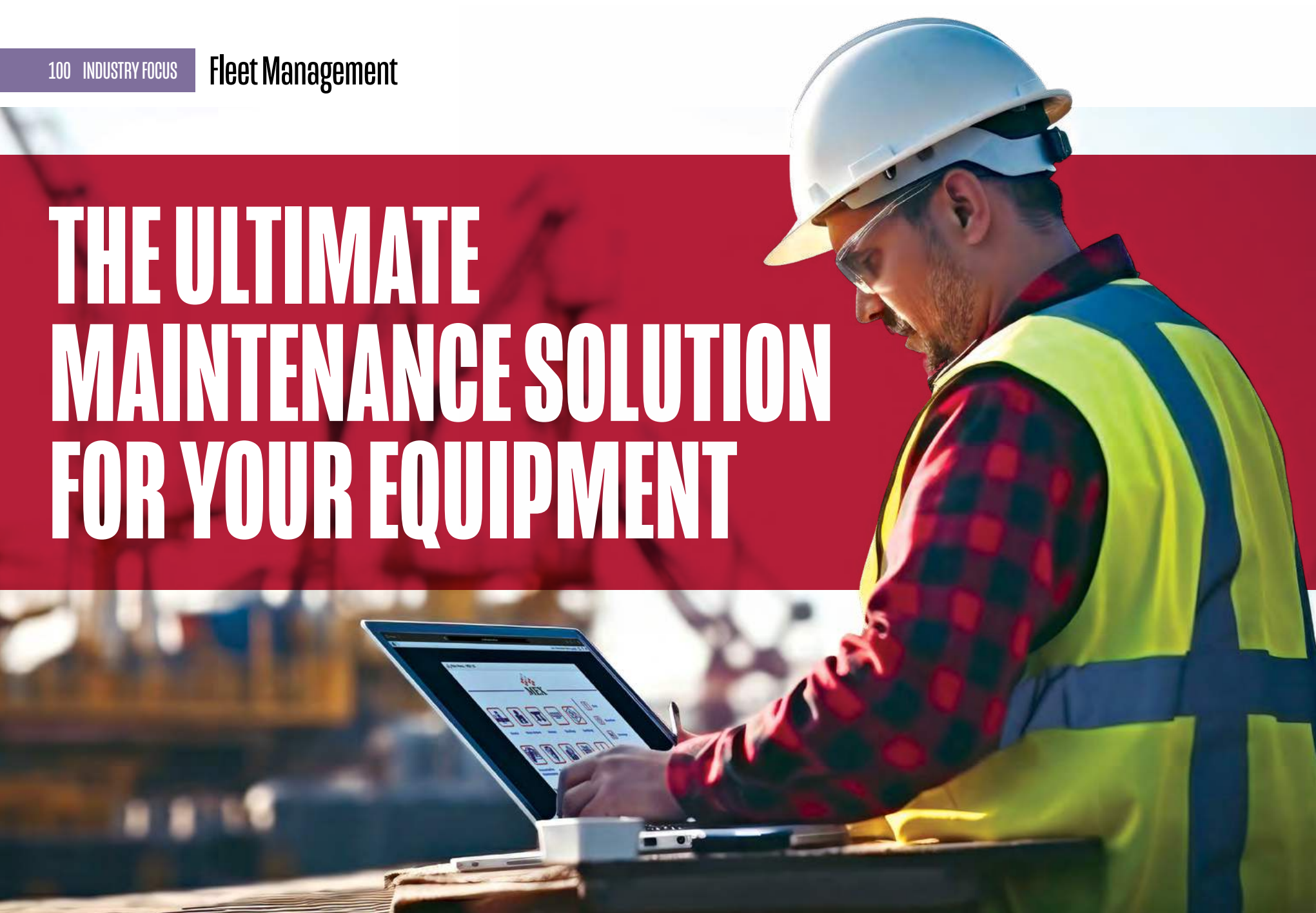
Call or email us to discuss your hazardous areas

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E: enquiries@moxi.com.au
W: www.moxi.com.au

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M: (61) 421555004
E: Santhana.dass@marteqenergy.com.au
W: www.marteqenergy.com.au

RTO #: 51160
Electrical Contractor #: EC11916

THE ULTIMATE MAINTENANCE SOLUTION FOR YOUR EQUIPMENT



30 Years of Innovative Excellence with MEX

For thirty years, MEX Maintenance Software has led the way in providing Computerised Maintenance Management Solutions (CMMS) in asset intensive industries. Proudly Australian owned and based out of Brisbane, our dedicated team at MEX is devoted to ensuring smooth mining operations. We have not only transformed maintenance practices for our Australian clientele, but also extended our innovative solutions to global partners in the mining sector. Offering improved safety, equipment reliability, increased uptime and enhanced operational efficiency.

Experts in Maintenance Management

MEX specialise in delivering solid asset management solutions designed to empower mining operations, regardless of their size. Among its many strengths, MEX shines brightly in its robust asset management capabilities. Empowering operations of all sizes to efficiently track and manage assets throughout their entire lifecycle. From capturing all asset information, trade durations and spares usage to organising critical documents and beyond, MEX ensures that every maintenance activity is seamlessly recorded and expertly managed.

In the world of maintenance, reactive approaches can be costly and detrimental to operations. To tackle this challenge head-on, MEX offers a comprehensive Preventative Maintenance solution, allowing mining operations to efficiently manage all repetitive and routine jobs. By creating Work Orders for assets based on defined schedules, MEX ensures that critical equipment and facilities are safe to operate and remain in optimal working conditions, thus preventing unexpected breakdowns and costly disruptions. With MEX, any operation can transition from a reactive maintenance model to a proactive one,

gaining better control over their maintenance processes and ultimately increasing overall efficiency and reliability.

Efficiency is the name of the game, and MEX delivers with its Work Order management capabilities. From task assignment for maximum productivity to quick and precise searches for specific jobs, MEX streamlines the process, making it effortless to access historical records and stay on top of work progress.

Effortless Setup: Get Up and Running in No Time

At the heart of MEX's asset management prowess is its easy-to-use UI, multi-platform applications, intelligent import facilities, ready-made statutory reports, and comprehensive customisation options for both the system and reporting. With MEX, reducing setup time is effortless; simply import all assets, associated information, preventative maintenance templates, schedules, and get your maintenance operations up and running smoothly.

Take Control of your Maintenance Requests

But MEX's capabilities stretch far beyond mere asset management. Its foolproof maintenance request system, housed within the MEX Ops Requests online portal, streamlines communication between maintenance departments and other employees. This ease of request submission and tracking enhances operational efficiency and responsiveness to maintenance needs. High-priority requests can be easily converted into actionable work orders, while intelligently filtering out low-priority issues.

Effortless Inspections on the Go

Inspections play a pivotal role in ensuring optimal operational efficiency. MEX Inspections are engineered to simplify the entire process, making execution,

management, and reporting effortless. With our user-friendly platform, setting up inspections is a breeze, and the MEX PM Activator takes charge of creating and dispatching jobs to your team seamlessly. The powerful MEX app allows your team to conduct inspections conveniently using handheld devices, liberating you from the constraints of paperwork and location.

Capture Pre-Starts Anywhere, Any Time

Tired of filling out paper based prestarts? With the Introduction of MEX Prestarts, we have gone digital with an interactive checklist that you can complete on any device, anywhere and at any time. All information is securely recorded and saved directly within MEX, ensuring that you never lose any important prestarts again.

Your operators can now run through a series of checks that reinforces safe operation but also identifies any faults to be corrected then and there. Creating maintenance requests or work orders can then be created in MEX to capture and allow the maintenance team to rectify any issues.

Data-Driven Insights: Maximising Potential with MEX Reporting

The effectiveness of MEX extends to its robust analytics and reporting features. Key performance metrics, trend analysis, and custom reports allow managers to make informed, data-driven decisions. By tapping into these insights, administrators can foster continuous improvement in maintenance practices.

Backed by a Passionate Team

From sales to training, MEX places customer service at the heart of its mission, ensuring your maintenance journey is nothing short of exceptional. When it comes to support, MEX goes above and beyond. Our dedicated team is always at the ready, armed with the expertise to handle and

resolve any issues that may arise, ensuring swift and proactive problem-solving. With our roots firmly grounded in Australia, we understand the unique demands of mining operations, allowing us to provide tailor-made solutions with a personal touch.

Igniting Potential through Comprehensive Training

Knowledge is the key to unlocking potential, and MEX is dedicated to arming you with it. Our comprehensive training sessions, available online or in-person, in one-on-one or group settings, empower you to harness the full capabilities of the CMMS system.

By maximising your understanding, you'll take control of your maintenance processes, optimising resources and elevating productivity to new heights.

30 Years and Counting

As MEX Maintenance Software proudly celebrates 30 years of excellence, industry experts acknowledge its transformative impact on maintenance operations. With MEX as your trusted partner, experience improved equipment reliability, maximised uptime, and enhanced operational efficiency. Join the growing community of satisfied clients and revolutionise your maintenance practices with MEX.

Join the growing community of satisfied clients and take the next step in transforming your maintenance practices with MEX. Experience firsthand the innovation and excellence that have made MEX Australia's leading CMMS provider, proudly connecting maintenance and mining asset management for three decades.

To discover the power of MEX CMMS Today, visit www.mex.com.au today or contact sales@mex.com.au to schedule a consultation.

AMR

30
YEARS

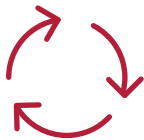


AUSTRALIA'S TOP CMMS PROVIDER

Elevating Maintenance Efficiency

For 30+ years, MEX has led the way in providing Computerised Maintenance Management Solutions (CMMS) in the mining industry throughout Australia and the world.

With the trust of over 12,000 users worldwide and a spotlight on preventative maintenance, MEX specialise in delivering solid asset management solutions designed to empower mining operations of all sizes.



Track & Manage Assets Throughout Lifecycle



Efficient Request Management



Capture All Job Details



Schedule Preventative Maintenance

Contact Our Friendly Sales Team today at sales@mex.com.au or visit www.mex.com.au



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THE AUSTRALIAN
MINING REVIEW

OVERWATER ACCESS SPECIALISTS



Formed in 2006, Australian Barge Hire (ABH) is Australia's largest provider of road-transportable modular jack-up barges.

Designed for the support of cranes, excavators and geotech drilling equipment for nearshore construction, ABH's barges are hired for geotech drilling campaigns, and bridge and wharf maintenance works. ABH's current fleet size comprises of seven jack-up barges. The deck jacking capabilities range from 2 tonne to 80 tonne, and all are of modular design for flexible and efficient transport solutions to sites all over Australia.

While ABH also offer modular floating solutions, our Jack-up barges are unique as the barge can be elevated out of the water above waves and tidal movements, providing a safe and stable working platform for the clients on deck equipment. All jack-up barges are fitted with moonpool for geotech drilling, most have 2-3 tonne deck cranes and the spud legs range from

12m to 36m enabling safe operations in water depths from 1m to 25m+. ABH has designed lay down legs on our smaller JUB's, perfect for getting in and under bridges where overhead clearance is an issue.

The modular design of the ABH fleet of floating and jack-up barges means we can offer a barge that suits most client's requirements. When the barges are transported by road the pontoons are unloaded by crane and are assembled in water, coupled together through a pin/connector system. The jacking system is then installed on each corner of the barge with an onboard hydraulic power pack to raise and lower the legs. Typically the barge assembly is 2 days and the same assembly crane will lift the client's equipment onto the barge during this assembly phase saving time and cost.

A lead-in period of a month is usually sufficient time for ABH to conduct the initial desktop site assessment, planning and

mobilisation. Safety and environmental considerations are paramount in the maritime industry, and Australian Barge Hire places a strong emphasis on these aspects. Our fleet is well maintained and regularly operates on tier 1 construction and mining sites. All vessels are in AMSA Survey and are fitted with regulatory safety equipment and operated by qualified and experienced crew that have experience all over Australia.

Common applications for our modular floating and jack-up barges include crane and lifting duties, jetty maintenance, port construction, marine drilling and piling, vessel maintenance, bridge access and asset maintenance work across ports, oil and gas, renewable energy and mining industries.

Currently, ABH have projects in Sydney and Darwin and anticipate to commence new projects in Victoria and Western Australia in the coming months. In the last 12 months alone, ABH have completed proj-

ects in Port Hedland, Brisbane, Tasmania, Port Adelaide, Newcastle, Sydney and Port Melbourne. If required, ABH can provide a complete marine package of personnel transfers and towage services, or have the client provide those services if that is more efficient.

Over the past decade, ABH's barges have played an integral part in some of the major marine construction projects such as Lucinda Wharf upgrade, the Gladstone QCLNG Project, the BHP Hay Point HPX3 Expansion Project, the Yamba Outfall Construction Project, the Western Harbour Tunnel Beach Link, the Eden Jetty Extension, the Weipa Rio Tinto Mission Bridge maintenance Project, Port Hedland FMG wharf maintenance project, and the Newcastle Wangi Mine geotech campaigns.

For more information or to request a quote, visit www.australianbargehire.com or call 02 9531 2900.

AMR



AUSTRALIA'S NUMBER ONE JACK-UP & CONSTRUCTION BARGE HIRE COMPANY



Jack-up barges are specialist vessels that can be elevated out of the water above waves and tidal movements to provide a safe and stable working platform.

Applications include:

- ✓ Crane and lifting duties
- ✓ Port construction
- ✓ Overwater Geotech investigations
- ✓ Bridge access
- ✓ Jetty maintenance
- ✓ Marine drilling and piling
- ✓ Vessel maintenance
- ✓ Maintenance works

Contact:

- ✉ info@australianbargehire.com
- ☎ 02 9351 2900
- 🌐 www.australianbargehire.com



INVEST IN YOUR MOST IMPORTANT RESOURCE, PEOPLE, WITH “HUMAN CENTRED WORKPLACES”



Furniture Options, together with its many luxury brand partners, are considered the driving force when it comes to new concepts and innovations for mine site living, offices, boardrooms, lounges, and dry and wet mess areas. Numerous mining companies are now reinventing the FIFO working lifestyle by building and improving existing accommodation precincts to attract and retain quality workers and "prioritise health and wellbeing".

One West Australian mining company is even completely reinventing fly-in, fly-out working trend by building new luxury accommodation precincts to attract younger workers so as to "prioritise health and wellbeing". Mine site workers stay in temporary accommodation units called dongas, but eventually, many of these will be replaced by far more luxurious pods to attract younger workers, including women and couples.

In view of the ever-increasing competition for skilled and talented people within the mining sector, longer working lives and increasing problems with health, virtually

all industries and organisations are now facing new challenges and issues when designing user friendly workspaces that your talent enjoys spending time in. Our simple mission for mine site culture is to create and improve these environments while on site. Our people-centric furniture is truly made to stand the test of time with styling and hard-wearing quality. Fostering well-being, collaboration, identity and purpose is pivotal to commercial success in the mining industry.

This global trend of work/life sustainability, agile forms of cooperation and well-being have now been translated into exemplary solutions for your mine site. The resource sector must ask itself: Does your mine site have this appeal and as a result increase employee loyalty and motivation? Does your workplace encourage communication, collaboration and learning? Does it keep the workforce as healthy and productive as possible until they retire? The answers lie in a complete rethink of virtually all mine site area processes customary to date.

Furniture Options have over 25 years of

diverse international project experience in relation to the "Human-centered Workplace". We thus provide both practical and valuable orientation for envisaging office environments where people "Love to be" and as a consequence naturally more productive. Our organic approach is to create timeless design that improves work conditions within mine site and shapes each company's cultural progress.

Furniture Options, socio-ecological responsibility and a commitment to mine site culture always go hand in hand which therefore nurtures and cultivates these ever-changing values that connect us all.

For many years we have been empowering businesses to create environments that transform a building into a unique establishment. For this reason, many of Australia's leading mine sites, hotels, restaurants, education centres, offices and healthcare organisations have turned to Furniture Options for their expertise and specialist service.

As a direct importer, we offer a broad scope and depth of knowledge on the

world's latest and leading brands, backed by collaborative relationships with both our clients and industry.

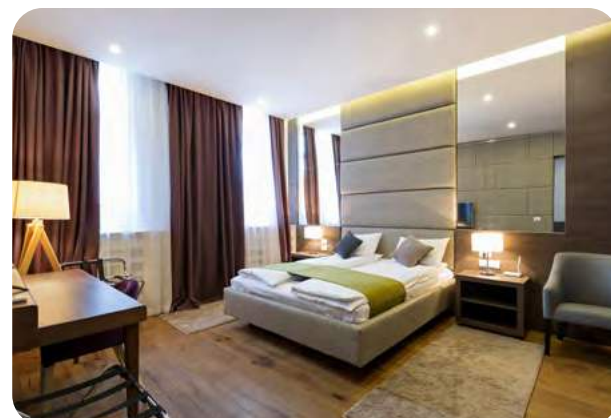
Step into our Perth showroom to discover and interact within a world of commercial furniture and lighting for the mining industry. With sleek, contemporary and sustainable design, Furniture Options supply a wider range of products and fabrics that undergo rigorous safety and durability testing.

Sourced from both international and local suppliers with hundreds of years of experience in furniture making. "As the race to attract and retain the best talent intensifies, we know our focus on mine site workplace health and wellbeing will help set us apart."

Feel free to contact us via email or phone or visit our award-winning showroom at 6A Aberdeen St, Perth for a free design consultation.

**For more information, visit
www.furnitureoptions.com.au**

AMR



F|O

FURNITURE OPTIONS

Furniture Options has an extensive range to supply all the areas of a mine site including office, dining, accommodation, training rooms, staff breakout areas, bedrooms and both indoor and outdoor recreational areas - our flexible options allow you to express your identity through furniture.

Furniture should honour the precept of 'health and wellbeing' but also create an ambiance that expresses; 'you are valued here, and your comfort has been considered'.



The Mining Sector demands high-quality furniture that is safe, practical, and ergonomic.



Just as you consider the needs of your talent, Furniture Options puts your needs first. We will listen to your requirements and help you choose suitable products from our extensive local and international range.



With many Australian mines refurbishing their premises to ensure their future success, we are able to assist with any furniture selections and appropriate applications of finishes, with our prices covering a broad spectrum for any budget requirement.



Book A Free Design Consultation Today

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| furnitureoptions.com.au

SAVE TIME, MONEY AND VALUABLE WATER WITH PIPEFREEZING

AMR: How would you talk a potential client into using pipe freezing?

RG: The main advantage of pipe freezing is that we can maintain a system's uptime and the client doesn't have to shut that critical pipeline down. Essentially, if people need to work on a pipeline, for example they may need to change out a faulty or damaged valve. The only way other way this can be achieved is to drain the pipeline down and dispose of the contents to safely complete the task.

What we do is we freeze the contents of that pipe - and it can be oil, it can be diesel, it can be water, whatever - if it's got a hydrogen atom in it, we can freeze the pipeline and make a temporary block with a cryogenic ice plug. Usually with a valve changeover we will freeze either side of the valve and only the water in between the two freezes is lost instead of the whole pipeline's contents. The client can then replace the valve without having to drain the water, refill or purge the air from the system. This saves water and crucial down time.



For example, say it is a bore line that might be 100 kilometres long- you are talking about millions of litres of water which they will have to work out how they will deal with it. By freezing just, a small section of the pipe we can keep all that water in the pipeline yet still achieve the job that they need to do.

AMR: How large is the area that you are freezing?

RG: It depends on the size of the pipe, the larger the diameter, the longer the plug we develop. However, with Pipefreezing it is essential that there is no flow or air in the pipe and the pipeline contents is below 25 degrees, preferably lower especially on larger pipes. In our job planning we work with the client to determine the best approach for their specific requirements.

AMR: What are some of the benefits your service is providing to mining companies?

RG: The key benefit is maintaining system uptime. By pipe freezing we only need to

isolate the exact area where work must be carried out. This allows the continued use of the wider system. For example, we recently completed a project at a large South Australia mine site. Our work is focused on the ring main that services the safety shower network in the smelter. There are only two pipes that are faulty, so they only need to replace a small amount of pipe work on these two lines, by using pipefreezing the other 50 odd showers on that line, are live and ready to use. The other alternative would have required draining the entire system resulting in having the safety showers inoperable for whatever length of time it took, then to do the repairs and finally refill the lines to get the system back up and functioning. Obviously, you cannot operate a smelter without safety showers, and they are not the easiest plant to shut down - Pipefreezing maintained the uptime of the plant and continued production.

Another example is the fire protection infrastructure for a power station. That power station provides about 40% of South Australia's power and there was a requirement to replace a valve on a fire protection line. Now there are probably around twenty valves of that size in this plant, but there is no other way to isolate that section as the valve is the isolation point. If we didn't freeze that pipe, they would have to drain that line down which we calculated was carrying close to 200,000 litres of water. If that line is shut down, then there is no protection for the plant.

AMR: There must be a great deal of expertise and experience in operating a critical service like this. How long have you been doing this for?

RG: I've personally been involved for over 15 years and our technology partner in Sydney has been in the business for over 35 years now. We've successfully completed well over 350,000 pipe freezes between us.

We would be biggest dedicated pipe freezing group in Australia.

We are also the only Pipefreezing company in Australia that has all the relevant ISO certifications, we are certified to ISO 9001:2015 / ISO 45001:2018 / ISO 14001:2015.

AMR: Finally, why would mining companies hire Pipefreezer?

RG: Mining is all about maximising production, any downtime or loss of production for a mine site is extremely costly, by utilising our services we either minimize this or ideally there is no downtime at all.

At the same time, water is a very big component of a mining operation and where we can also add value is with water conservation. The miners don't want to be dumping millions of litres of water in the desert or cart it away to another location. There are new water conservation guidelines coming through so this is going to become more and more important, and on top of that we are now entering an El Nino event with much harsher and drier conditions over the coming years.

Our purpose at Pipefreezer is to provide a cost effective and environmentally friendly method of pipe isolation on projects requiring pipe modification, pipeline maintenance or pipe repairs.

We add value for our customers by understanding their needs. We deliver quality, technical innovation, and a responsive service.

By partnering with us on your fluid isolation project, we significantly minimise system downtime and consequently reduce the impact of any pipe repairs or pipeline maintenance. One of the key benefits we can bring to the table is allowing your plant and equipment to continue normal operations with minimal disruption.

Pipefreezer's passion is to provide a superior, value-add service to its clients in the mining, HVAC, plumbing, fire services and building management industries by offering cost-effective and first-rate solutions to costly and time-consuming system drain downs.

Our aim is to keep our impact on the environment at a minimum and we always put safety first in all of our practices.

Our processes and procedures are innovative, well planned and client focused - designed to create value through saving time and resources. **AMR**

SOURCE
Pipefreezer
P 1300 747 373 or 0404 555 552
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W www.pipefreezer.com.au



Servicing all areas in Australia and New Zealand, Victorian headquartered Pipefreezer is offering a specialist service that is providing major savings for mining companies in reducing costly downtime and improving water management. The *Australian Mining Review* recently spoke to pipe freezing specialist Richard Griffin about what makes the company's services so valuable for companies with a pipe issue.

WHY SHOULD THEY CHOOSE PIPEFREEZING?

- It maximises system uptime
- There is absolute shutoff - no leaks
- Its cost effective
- It saves time
- Its environmentally friendly - there is no wastage of water, chemicals, glycol, or other pipeline contents
- It provides isolation for leak detection
- We partner with you to tailor the best solution for your requirements

**PIPEFREEZER**

THE AUSSIE MINE BOSS STORY

Warwick Lorenz, Managing Director of Australian Pump Industries, takes an insightful look into the past, present and future of Australia's mining equipment manufacturing industry.



In production, the 4" B4XR-A/ST being fitted to the Kohler KD625 engine.



A production run of 4" Mine Spec pumps at Aussie's 2 1/2 acre factory in north west Sydney.

It's tremendously encouraging to see companies re-evaluating the idea of manufacturing mining and construction equipment right here in the country! The honeymoon with cheap third world products at irresistibly low prices seems to be coming to an end!

Some of us are old enough to remember leading manufacturers of mining and construction gear coming to Australia in the 50's, 60's, and 70's with a plan to build that equipment in Australia. Some even remember that we had a home-grown mobile machinery manufacturing industry, that felt it could do anything.

The country used to build Allis Chalmers motor graders at Bennets Green near Newcastle in NSW. At the huge Rydalmere plant of the old Tutt Bryant empire, they were building 150 tonne dump trucks and "Tournadozers".

In those days, manufacturers were protected by tariff barriers, some as high as 55%. Getting import licences was also a challenge! We have to remember, thinking back to those days, the population was a fraction of today's and the wealth of the country revolved around Merino wool, not iron ore, coal, gas and gold!

As those tariffs came down, imports became substantially more attractive (relaxed import regulations) and Australian manufacturers found themselves up against mass producers from the US, Europe and ultimately Japan! Great companies like Caterpillar, Euclid, Komatsu and Liebherr all entered the Australian market. They were followed

by a horde of great excavator brands to replace the old Australian made "backhoes".

The rest is history, with most manufacturers, even the innovative Chris Pannell (Pannell Plant compaction equipment) either became importers or simply disappeared.

THE NEW WAVE OF INNOVATION

What pleases us is to see a new generation of innovative companies building machines, based on the 'Australian Experience'. Who would have thought we would become the world's greatest miners? It seemed like the death and destruction of Australian manufacturing is not an entirely true story. Sure, we lost thousands of apprenticeships but, we know that the innovators will ultimately win. Australia's Mining Review newspaper is full of them, emerging confidently, inspired by the industry.

WHAT AUSSIE MINERS WANT

What they really want is more time! Everything gets back to efficiency levels, cutting downtime with more productivity! As a pump manufacturer, we've had experiences where mining companies have bought third world pump equipment, only to find out that there are problems with both the pump and engine. That can become a critical issue, particularly in so many applications that involve the transfer of liquid!

A flooded mine is not productive. Leaking pipes, can generate not only potential contamination but, in a situation of health issues, can even shut down the mine. System blockages and constricted pipes can

Aussie's 2" Mine Boss self priming trash pump.



ruin efficiencies, generate system failures and have catastrophic results.

Production is everything and mining equipment suppliers work every day to generate solutions to combat those potential problems. Most of all, we see a growing unrest and distrust of cheap third world products and a tendency to move with products that are well known for their reliability, safety standards and ethics. It may sound corny but, when it comes down to it, miners, unions and mine owners all want the same thing! A safe, productive environment for a successful outcome!

THE AUSSIE PUMP APPROACH

Here at Aussie Pumps, we've got a simple formula. We want to build and supply pumps and pressure cleaners for miners that we would want to use if we were operating in those potentially dangerous and demanding environments. Having faced that, and after lots of contact and feedback from mines of all types and sizes, we gradually evolved a product line that is truly Australian.

The products include self priming centrifugal pumps that are ultra reliable. We even warrant our pump ends for five years from the date of supply. That's something we've noticed none of our competitors have been courageous enough to do. Traditionally, we matched them to first world diesel engines, to ensure that our customers only get the very best, in terms of after-market support.

The engine warranty is the responsibility of the engine manufacturer. The OEM, in

this case, Australian Pump Industries, is responsible for what we bolt onto it and for the match testing to make sure that it runs smoothly and within the power range.

We work with great companies like Kubota, Yanmar, Hatz and Deutz to make sure what we're putting together is a 'perfect match' of product to engine.

A VERY SUCCESSFUL FORMULA

Firstly the team at Aussie worked to develop the world's best self priming pump range. Initially this was our QP (Quik Prime) range of water transfer pumps. We got great support from engine manufacturers and only worked with the best.

Originally configured for agricultural applications, Aussie turned them into products suitable for what are probably the worst operating conditions on the planet. We didn't only work directly with miners but, with great hire companies like Coates, who have been deeply involved in the mining industry for decades. Coates' reputation is based on reliability and performance with kit that works.

As a result of that continuous evolution of experience, we started building pumps which were designed for the rough handling in tough conditions. We started with trash pumps!

ENTER THE MINE BOSS

2", 3" and 4" engine drive trash pumps used to be regarded as disposable items on sites. We heard stories of pumps being buried when they failed. Today, we build them super tough.



Aussie's new toy ... A big 4" cast iron semi trash pump.

We started with big 3" and 4" heavy duty QP trash pumps, powered by Yanmar 10 hp electric start diesel engines. Our engineers put together frames that were tough enough to look like they came out of a North American blacksmith shop, hot dipped gal'd and with huge integrated lifting bars. Today Aussie have transitioned to using stainless steel frames on the Mine Boss series for their corrosion resistant capabilities.

To comply with mining requirements and with a plan to keep operators safe, the pumps are fitted with battery isolation, E-stops, fire extinguishers and loads of fluorescent tape.

MORE HEAD PLEASE

Aussie's Mine Boss trash pumps are fitted with big open impellers for solids handling and delivering large flows. However, by design they are not capable of performing in high head applications. To solve that problem Aussie Pumps adapted a big 4" high pressure fire pump, designed for village fire protection, into the Mine Boss configuration. Fitted with closed impellers the pumps can deliver exceptional high head performance. An example is 400 lpm and 50 m head from a 3" or 4" self primer.

Now available in 3" and 4" options, these pumps, part of the original fire pump "Brigade Boss" are set up for use in mines. That means fitted into Aussie's heavy duty stainless steel frames with E-stop, battery isolation and fire extinguisher.

An integrated lifting bar makes them easy to move around and they handle heads as high as 70 m! That combination of high

flow and high head means they can be applied to numerous chores around mine sites. The self priming capability makes them fast to set up and simple to start.

NEW KID ON THE BLOCK

Primarily used for water transfer the bodies of these Aussie QP Mine Boss series are manufactured from aluminium. However, the need for handling corrosive and abrasive water has seen the Aussie Mine Boss story evolve into heavy duty cast iron pumps and even 316 stainless steel versions!

Feedback from the mining industry has pushed Aussie Pumps to develop two new 4" high flow pumps in Mine Boss configuration; one in cast iron and one in stainless steel.

The cast iron version, driven by a 25HP Kohler KD625 diesel engine, is in a semi trash configuration and features an open style impeller. This will deliver a maximum flow of 2300 lpm and a total head to 29 metres. Called the B4XR-A/STD the cast iron construction delivers even better longevity in tough conditions pumping solids contaminated water.

The big open style impeller will pass spherical compressible solids in suspension up to 39mm in diameter! Apart from that, these big, simple pumps come with stainless steel wear plates and silicon carbide mechanical seals with counter-face and nitrile rubber elastomers.

The cast 316 stainless steel version, also driven by a Kohler KD625 diesel, will provide real capability for pumping highly corrosive liquids. The cast stainless steel

impeller is designed to deliver more total head, up to 31 metres, but slightly less flow, 2100 lpm with a reduced solids handling capability (down to 32mm).

Aussie expect to make further refinements to the Mine Boss frame used on these new pumps but we are pleased with initial feedback from the market.

MORE FIRE POWER

Although the Aussie Fire Chief was regarded as the world's best lightweight portable fire pump, building it as a Mine Boss version had some challenges. We powered it by an L48 Yanmar 4.8 hp diesel engine, but built it into a super heavy duty stainless steel frame with integrated balanced lift bar.

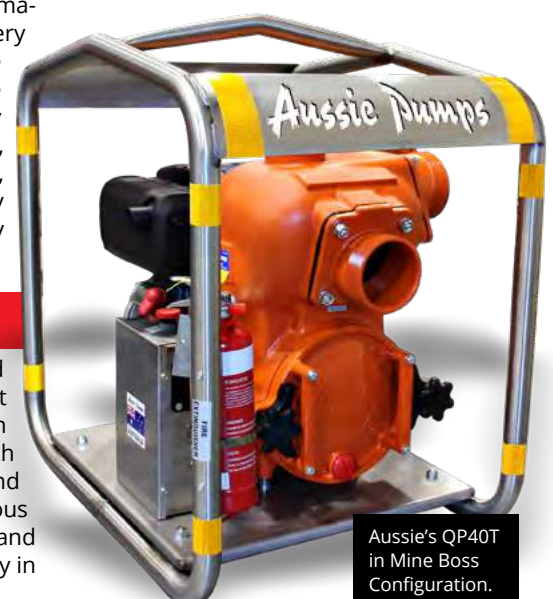
The frame with sub base and anti-vibration mounts, like all our Mine Boss machines, was accompanied by battery isolation, E-stop and the essential fire extinguisher. The pumps were a huge success and were quickly followed by twin impeller super high head versions, capable of delivering up to 90 m head, and flows as high as 450 lpm. They are compact, reliable and all backed by Aussie's free extended warranty!

WHAT NEXT?

Here at Aussie Pumps, we are focused on Australian design, using only first world components. That way, we plan to continue to develop machines which are targeted to be the best of their kind in the world. That sounds pretentious but the Aussie Mine Boss fire pumps and our high head product lines are already in service all around the globe.

We are so proud of the Aussie Mine Boss product range and it gives us hope for Australian manufacturers. We just simply must be better than imports, provide product which is more suitable for all the applications and put them on the market at a reasonable price. It's a challenge for all of us in the manufacturing business. However, if you're going to be successful in manufacturing, you can't just cut costs to beat importers.

For further information and the continuation of the Mine Boss concept applied to the pressure cleaner range of Aussie's products, contact Australian Pump Industries. For more information on the continuing development of the Aussie Mine Boss range, see the next edition of Australian Mining Review. www.aussiepumps.com.au. **AMR**



Aussie's QP40T in Mine Boss Configuration.

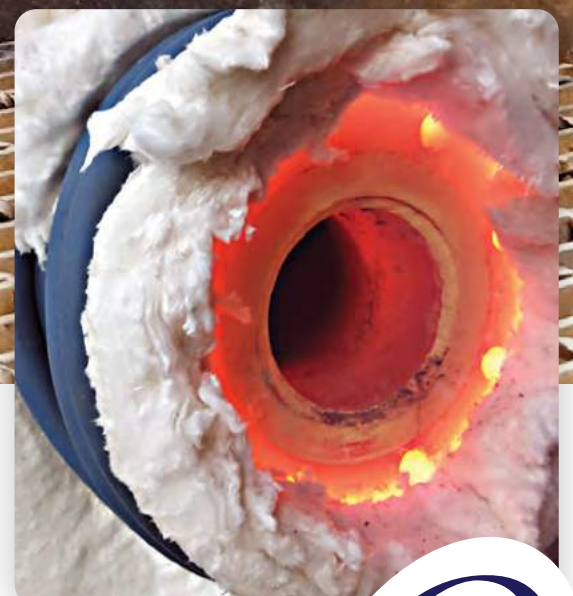
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