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# MINING REVIEW

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Engineering chief executive and managing director David Singleton about the company's design and manufacturing approach.

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# STRONG STREAK

## WITH RESOURCES & ENERGY EXPORTS

Cargo ship.

Despite softening commodity prices, the outlook for Australia's resources and energy exports remains positive, with a strong investment in Australia's major resource and energy project expected to see continued growth over the next few years.

The December 2023 edition of the *Resources and Energy Quarterly* (REQ) from the Federal Industry, Science and Resources Department forecasts export value to ease to \$408b in 2023-2024 and \$348b by 2024-2025.

This is down from a record \$466b last year, primarily due to projected falls in commodity prices.

This outlook is in line with previous forecasts in June and September 2023.

Simultaneously, the department's *Resources and Energy Major Projects* (REMP) report found the outlook for resources investment remains healthy, particularly for critical minerals that are crucial for low-emissions technologies needed to help the world decarbonise.

Further, the *REMP* reported there are 421 resources and energy projects under development in Australia at the end of October, up from 393 projects a year earlier.

The value of project completions rose for the third straight year, with 29 projects valued at \$21b achieving commercial production to the year ending October 2023.

Federal Resources and Northern Australia

Minister Madeleine King says the strong outlook for critical minerals projects supports the Federal Government's strategy to become a major exporter of clean energy by 2030.

"Australia's resources sector remains the engine room of the nation's economy," she said.

"Resources are critical not only to our prosperity, but to our commitment to reducing carbon emissions and reaching net zero.

"The road to net zero runs through Australia's resources sector."

Minister King says the *Major Projects* report showed the strong state of investment in Australia's resources sector and the

continued growth in the country's critical minerals sector.

The REQ found iron ore prices held up stronger than previously forecast, increasing from \$124b last 2022-2023, to \$131b in 2023-2024.

Liquefied natural gas earnings are set to ease from \$92b in 2022-2023 to \$73b this year and \$64b in 2024-2025.

Lower prices for lithium means Australian lithium exports are forecast to decrease to \$14b this year and stabilise at \$15b in 2024-2025, while earnings from metallurgical coal are expected to ease to \$52b in 2023-2024 and \$41b in 2024-2025.

AMR

# MOUNT ISA MINES CELEBRATES 100 YEARS

One of Australia's most iconic mining operations — Mount Isa Mines — has celebrated its 100th birthday.

Formed on 16 January 1924, the discovery of Mount Isa Mines came almost a year after prospector John Campbell Miles discovered mineralised outcrops near the Leichhardt River that contained high grades of lead-silver.

Since then, the operation has grown to be a major contributor of copper, zinc and lead to global suppliers.

These minerals are used in everyday items such as phones, laptops, electric cars and renewable energy technologies.

Several significant mining industry innovations were pioneered at Mount Isa Mines, including the ISASMELT smelting technology, the IsaMill fine grinding technology and the Jameson Cell flotation technology.

All of these innovations are part of Glencore Technology and sold to customers around the world to help extract more

from their metal and mineral processing assets — lowering costs, reducing energy consumption and improving safety outcomes.

Glencore chief operating officer zinc and copper assets Sam Strohmayr commented on the milestone.



(Image source: Glencore) Mount Isa Mines.

"This remarkable achievement reflects the qualities of resilience, drive and dedication that define our company," he said.

"Our success has been built on the hard work of former and current employees, support of the community and a commitment to excellence in all our endeavours.

"Our long history is made-up of hard work, countless stories, fond memories and valuable experiences for people who have either worked at Mount Isa Mines for a short time or several generations."

In mid-October 2023, Glencore announced that it would be closing the Mount Isa Mines underground copper operations (Enterprise, X41 and Black Rock) and copper concentrator in H2 2025 after 60 years of copper mining.

Glencore's Lady Loretta zinc mine, a finite orebody with a seven-year mine life, will also close in 2025.

The mine's other metals assets including the copper smelter, George Fisher mine, zinc-lead concentrator and lead smelter in Mount Isa, plus the copper refinery in Townsville, will continue operating.

Over its life, Mount Isa Mines produced enough copper to build over 39m houses and enough zinc to manufacture over 535m cars. AMR



# WE WANT *Nickel* back!

## The surplus that sparked a series of mine shutdowns

**N**ickel prices are expected to be rangebound for most of this year, following its almost 50% drop in 2023 from just over US\$30,000/t to about US\$16,000/t.

The International Nickel Study Group (INSG) forecast in October last year that nickel surplus would continue into 2024, with oversupply reaching 239,000mt, relating mainly to class II (nickel pig iron and ferromickel) and nickel chemicals (principally nickel sulphate).

Falling nickel prices have set off a chain of events here in Australia amongst a handful of miners.

Panoramic Resources (ASX: PAN) announced its decision to suspend the Savannah nickel project, with the majority of staff on-site made redundant.

Operations have continued, including a shipment of approximately 10,000t of nickel concentrate on 3 January 2024.

After further engagement with major creditors, key suppliers and other stakeholders, the company's administrators have determined that operations at the Savannah nickel project will be suspended in January.

Panoramic employed about 140 staff on-site – the majority of them stood down and made redundant, some with immediate effect.

"While it was our intention to continue to trade-on the Savannah nickel project and preserve the employment of the operating team as we explored opportunities for a sale or recapitalisation of Panoramick's business, after consultation with major creditors and key suppliers it is apparent that the prospect of achieving a near-term turnaround of operations and finances is low," said Panoramic Administrator and FTI Consulting senior managing director Daniel Woodhouse.

"Given the near-term funding requirement for continued operations, we have made the difficult decision to suspend operations while the sale/recapitalisation process progresses.

"The Administrators, with assistance from Treadstone Resource Partners, will continue a dual track strategy to sell or recapitalise the Panoramic business.

"This process will continue regardless of the Savannah nickel project's operating status and look to realise the full value of the defined ore bodies, extensive infrastructure, and exploration potential of the project."

Adding to the list of nickel miners shutting down, First Quantum Minerals' (FQM) made a decision to scale back operations at its Ravensthorpe nickel mine, while also suspending mining at Shoemaker-Levy and bypassing the high-pressure acid leach circuits.

The company says stockpiles are sufficient for 18 months of production, after which time Hale Bopp and Halley's ore bodies will be mined.

This change in strategy aims to preserve the higher-grade Shoemaker Levy orebody until nickel prices recover and operating margins improve.

Andrew Forrest's Wyloo Metals will also place its WA mines – Cassini, Long and Durkin – bought mid-last year for \$760m, in care and maintenance on 31 May.

Wyloo is the major source of ore for BHP's (ASX: BHP)

nickel processing plant at Kambalda, WA, which will be shutting down in June as a result, impacting about 20 jobs.

In December last year, IGO (ASX: IGO) announced it was conducting a review of its Cosmos nickel project near Leinster, WA, where it was developing the Odysseus underground nickel mine.

"Regretfully, there will be an impact to some roles, however IGO is working on redeployments within the IGO business and is providing all the necessary support to our people through this process," the statement said.

These announcements come as aluminium producer Alcoa also put out a statement on the full curtailment of its 60-year-old Kwinana alumina refinery operations in WA, beginning the second half of 2024.

The Kwinana refinery has an annual nameplate production capacity of 2.2mt and has been operating at approximately 80% capacity since January last year.

Alcoa executive vice president and chief operations officer Matt Reed says the company "will work closely with [its] employees to provide support and transitioning to other opportunities".

"This includes potential redeployment within our business or assistance to facilitate employment at other workplaces," he said.

Alcoa says the curtailment will include a phased reduction of the workforce from around 800 employees at the start of 2024 to approximately 250 in the third quarter of this year, when all alumina production will cease.

The company added that certain processes will continue until about the third quarter of 2025, when employee numbers will be further reduced to approximately 50. *AMR*



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# NEW STRATEGIC MATERIALS LIST AND UPDATED CRITICAL MINERALS LIST: BACKING CRITICAL MINERALS FOR ENERGY, JOBS AND DEFENCE

The Federal Government has updated the Critical Minerals List to include fluorine, molybdenum, arsenic, selenium and tellurium, with helium removed.

It has also released a new Strategic Materials List of commodities and plans

to scope the creation of Strategic Critical Minerals Hubs around the country.

This new list identifies commodities essential for the energy transition which are not at risk of supply chain disruptions and includes copper, nickel, aluminium, phosphorous, tin, and zinc.

The Strategic Critical Minerals Hubs feasibility study will explore where Federal, state and territory governments could support critical minerals infrastructure precincts.

The updated critical minerals list and the strategic hubs feasibility study

flow from recommendations of the Federal Government's Critical Minerals Strategy, released in June last year, as well as feedback from industry and ministers on supporting critical minerals development.

Federal Resources and Northern Australia Minister Madeleine King says the changes follows extensive consultations with industry, the public, states, territories and will support Australia's growth as a major exporter of clean energy materials.

"The updated Critical Minerals List and the new list of Strategic Materials will help government focus on those commodities needed to create jobs, keep us secure and power our economy," she said.

"These minerals are critical to the greening of our economy and the defence of Australia and our allies.

"The Critical Minerals List and Strategic Materials List will be updated on an as-needed basis, as economic and geostrategic dynamics evolve.

"Australian copper, nickel, aluminium, phosphorous, tin and zinc will be vital to the world's energy transition, which is why for the first time ever we have articulated their economic and strategic importance by creating the new Strategic Materials List.

"Australia is well placed to meet increasing global demand for minerals, with large endowments, technical expertise and established resources supply chains," Minister King said. **AMR**

## ANSTO WELCOMES \$13.9M CRITICAL MINERALS FUNDING

Rare earth elements will be a key area of focus for the Australian Nuclear Science and Technology Organisation's (ANSTO) Minerals unit as it welcomes a \$13.9m funding allocation under the Australian Critical Minerals Research and Development Hub.

In a recent announcement by Federal Resources and Northern Australia Minister Madeleine King, ANSTO's funding will go towards a research project to accelerate the discovery, extraction, and processing of rare earth elements from clay hosted and ionic adsorption rare earth deposits.

The funding forms part of a \$22m package to support three key research projects under the R&D Hub for its participating Federal Government science agencies – ANSTO, CSIRO and Geoscience Australia.

ANSTO chief executive Shaun Jenkinson says ANSTO Mineral's extensive experience working with rare earth elements will help to unlock the potential for these types of lower-grade Australian deposits.

"Australia already has a rich supply of high-grade rare earths deposits and strong expertise in processing techniques to extract the most out of our resources, that puts us in a strong position globally," he said.

"This funding will allow us to gain an even

greater understanding of the mineralogy and processing routes needed to tap into clay-hosted and ionic adsorption deposits, which have higher ratios of sought after magnet metals."

Together with Geoscience Australia and CSIRO, this two-year project will enable ANSTO to:

- assess Australia's potential for clay-hosted and ionic adsorption rare earth element deposits;
- develop and test mineral processing options specific to these deposits;
- demonstrate how these deposits can be integrated into existing rare earth element separation processes to produce high purity rare earth elements;
- establish a dedicated testing facility at ANSTO; and
- enhance the environmental outcomes of critical minerals mining and processing.

ANSTO will also provide input to each of the separately funded projects led by CSIRO and Geoscience Australia as announced by the Minister King.

ANSTO will contribute to:

- CSIRO's \$5.2m metallisation project to develop a technical understanding of the conversion of tungsten mineral concentrates to high value-added chemical concentrates and tungsten oxides; and
- Geoscience Australia's \$2.7m



research project to explore the technical recovery of gallium from bauxite refining process liquors and determine how existing bauxite refineries will offer opportunities for Australia.

Mr Jenkinson says critical minerals and rare earths form a crucial component of key technologies such as personal electronic devices, transport, and telecommunications.

"Critical minerals touch on almost every aspect of our everyday lives, from smartphones, computers, and batteries, right through to fibre-optic cables we use in our homes and workplaces," he said.

"But of equal importance, they're also essential to producing green technologies

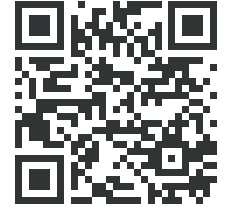
such as electric vehicles, wind turbines, and solar panels.

"Critical and strategic minerals such as rare earths, uranium, and lithium already form a large part of ANSTO's Minerals business.

"The recent shift in focus towards diversifying and securing their supply chains is an exciting re-direction to unlocking Australia's critical minerals resources and supporting our commitment to net zero.

"ANSTO is looking forward to continuing this invaluable work with our R&D Hub partners – Geoscience Australia, and CSIRO – and the Critical Minerals Office at the Department of Industry, Science and Resources." **AMR**





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# DAMPIER SALT

## TO SELL LAKE MACLEOD FOR \$375M



(Image source: Rio Tinto) Dampier Salt trucks.

**D**ampier Salt has entered a sales agreement for the Lake MacLeod salt and gypsum operation in WA to salt company Leichhardt Industrials Group for \$375m.

Dampier Salt is a joint venture between Rio Tinto (68%), Marubeni Corporation (22%) and Sojitz (10%).

Lake MacLeod is one of three solar salt sites owned by Dampier Salt with the other two operations in Dampier and Port Hedland.

It lies within Baiyungu country in the Gascoyne region

of WA and consists of a 1.5mtpa salt operation, 1mtpa gypsum operation and a deepwater port.

Dampier Salt is the world's largest exporter of seaborne salt with capacity to produce around 10.3mtpa.

Rio Tinto managing director port, rail and core services Richard Cohen says the sale will enable Dampier Salt to focus on enhancing its operational efficiencies at its other operations.

"Until the completion of the sale, the Dampier Salt leadership team's focus will be on safety, delivering

on plan, and maintaining respect for all people at Lake MacLeod and in the Carnarvon community," he said.

"We are pleased Leichhardt has committed to retaining all Lake MacLeod employees, ensuring continuity of operation and providing job stability to the 130-strong workforce."

Completion of the sale is conditional on certain commercial and regulatory conditions being satisfied, which is expected to occur by the end of the year.

AMR

## FIRST SHIPMENT OF THUNDERBIRD PRODUCT

**K**imberley Mineral Sands (KMS) completed its first shipment of about 300t of non-magnetic (zircon) concentrate from the Thunderbird mineral sands project in northwest WA over the weekend.

With production commencing ahead of schedule in Q4 CY23, KMS was able to ship its bagged product via Port Hedland to three existing offtake customers.

KMS is a joint venture company equally owned by Sheffield Resources Pty Ltd (ASX: SFX) and YGH Australia Investments Pty Ltd (Yansteel).

Sheffield Resources executive chair Bruce

Griffin says the company congratulates the Kimberley Mineral Sands team.

"[We] thank our offtake customers for this milestone achievement of first revenue for the Thunderbird mineral sands mine, and with KMS production ramp up progressing very well, we look forward to delivering further increased volumes of product to our customers in the coming weeks and months ahead," he said.

Preparations are underway for additional bagged shipments and the commencement of bulk shipping from Broome this quarter. **AMR**

(Image source: Sheffield Resources) Loading bagged zircon product on to vessel.



(Image source: Sheffield Resources) Bagged zircon product.





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**“MORE MINES  
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# MCA CALLS ON VICTORIAN GOVERNMENT TO BOOST MINING COMMITMENT

Trucks and excavators in an open pit mining for gold.

The Victorian branch of the Minerals Council of Australia (MCA) has submitted a pre-budget submission, calling on the Victorian Government to boost its commitment to mining and ensure the State realises its potential to play an important role in a once in a century critical minerals boom.

The submission highlights that the Victorian Government should have multiple new gold-antimony, mineral sands, rare earths and base metal mines by 2030.

This will create thousands of jobs and establish supply chain opportunities for businesses across regional Victoria.

To support Victorian jobs and regional

communities it also prioritises the following:

- improve approvals timeframes ;
- promote critical minerals projects, discoveries and processing technologies;
- competitive fees, charges and taxes; and
- build a skills pipeline through a regional skills package,

Demand for critical minerals such as copper, rare earths and lithium is forecast to increase drastically as essential inputs to modern technology.

MCA Victoria executive director James Sorahan commented on the submission.

“The world is facing a shortage of the

critical minerals and rare earths required to meet the insatiable global demand for renewable energy components, electric vehicles and modern technology,” he said.

“Victoria has the potential to supply mineral sands, rare earths, copper, antimony and gold, generating enormous economic benefits to regional areas, and creating additional revenue streams for the State.

“More mines mean more revenue.”

Over the past three years, Victoria has broken exploration spending records with \$572.6m invested in minerals exploration — the fourth highest across all Australian states.

There are six potential critical mineral projects in the pipeline in Victoria, from antimony to rare earths.

Victoria has known mineral sands deposits containing zircon and titanium minerals, and rare earth element-bearing monazite and xenotime which are used in wind turbines and batteries.

“MCA Victoria welcomes government initiatives to reform the mining legislation, introduce grants for critical minerals and a new project coordination role in Resources Victoria as advocated by MCA Victoria,” Mr Sorahan said.

“However, more remains to be done.” **AMR**



Map of South Australia.

## RECORD NUMBER OF MINING JOBS IN SOUTH AUSTRALIA

Business is booming in South Australia's resources and energy sector, with 918 job advertisements placed between October and December 2023.

This is the highest number of jobs advertised in this period since the Resources and Energy Skills Alliance (RESA) began producing the SA Mining and Energy Hiring Intentions Report in 2013.

This record demand follows upward trends in mining activity and investments in energy projects.

Regional areas are key players in South Australia's mining and energy jobs boom, with around 40% of advertised jobs located in this region.

South Australia Premier Tom Koutsantonis said the record results are evidence that the State's energy and mining sectors are key drivers of the economy.

“Mining activity in South Australia is up, investment in energy projects is up and job opportunities are up,” he said.

“These figures clearly demonstrate that South Australia's resources are highly sought-after globally as they continue to play a critical role in decarbonising our economy and supporting the world's transition to clean energy.

“It is particularly pleasing that well over a third of these jobs are located in our State's regions.

“These sectors are vital to the prosperity of our regional communities and to the State's economic transformation.”

Jobs were advertised across a wide range of professions, with trades and operators at 54%, professionals at 29% and supervisors / managers at 9%.

Health, safety and environment advisors, mechanical fitters, project managers and mining engineers are also in high demand. RESA chief executive Jodie Badcock commented on the figures.

“Mining and energy vacancy activity has consistently increased over the past two years, with demand in each quarter consistently equalling or exceeding the equiv-

alent period in the previous financial year,” she said.

“Demand is strong across high volume occupations in trades and operations and in specialist roles providing critical industry-specific skills.

“With 235 companies advertising in the sector in Q2 FY23-24, in roles that support mineral resources and infrastructure projects, industry demand is diverse both by type of employment and geographical location.” **AMR**



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# ALCOA WELCOMES DECISIONS THAT SUPPORT WA OPERATIONS



Bauxite - Willowdale Mine's Sampson Dam Reservoir and Causeway

**A**lcoa welcomed decisions from the WA Government that will allow the company to continue bauxite mining and downstream alumina refining in the State, while also pledging to enhance the way it operates to meet evolving requirements and expectations.

The WA Government has announced that it will approve Alcoa's latest five-year mine plan – known as the 2023-2027 Mining and Management Program (MMP) – for its Huntly and Willowdale bauxite mines.

In addition, the WA Government has granted an exemption that will allow Alcoa to continue its mining operations if the WA Environmental Protection Authority (EPA) decides to undertake a separate environmental impact assessment on all or parts of the MMP.

The EPA's determination is expected by year end.

Alcoa will be subject to a range of stringent conditions addressing key environmental factors that will include enhanced protections for drinking water, including increased distances from reservoirs, and biodiversity along with accelerated forest rehabilitation.

At the request of the State, the Company will also provide a \$100m guarantee, demonstrating Alcoa's confidence that its operations will not impair drinking water supplies.

Clearing for mining in the Northern Jarrah Forest will be capped at 800ha per year and the current rate of rehabilitation will double to reach 1,000ha per year by 2027. Separately, Alcoa has committed to work with the WA Government to modernise the State Agreements and the approvals framework for its two bauxite mines and three alumina refineries in the State.

This includes transitioning all proposed new major mining regions to the more contemporary EPA assessment and approvals process.

Alcoa started this process in 2020, when it referred its next two proposed mine regions (Myara North and Holyoake) for EPA assessment.

These commitments are in addition to Alcoa's earlier decisions to forgo mining around the forest towns of Dwellingup and Jarrahdale to enhance protections for lifestyle and recreation values.

Alcoa vice president operations for Australia Matt Reed says the decisions provided a balance between protecting local jobs and businesses while enhancing environmental protections.

"We are absolutely focused on operating in line with these new requirements and

evolving community expectations," he said.

"They mean we can continue to build on our 60 years of economic value creation, employment, and community support in WA while transitioning to more contemporary approvals."

The new MMP will support mining at Alcoa's current Myara and Larego regions at its Huntly and Willowdale mines.

It does not affect the EPA environmental impact assessment already underway for Myara North and Holyoake, the two proposed new mine regions.

That assessment is continuing with mining in these new regions not expected to occur any earlier than 2027.

Until then, Alcoa expects bauxite quality to be similar to recently reduced grades.



ALCOA Huntly Mine.

Bauxite quality at Myara North and Holyoake is expected to be consistent with historic higher grades.

Alcoa's operations directly employ almost 4,300 Western Australians, as well as a further 1,700 contractors at its bauxite mines and alumina refineries in Perth, Peel and the South West.

In 2022 Alcoa spent over \$1.5b on contracts with local suppliers.

WA Premier Roger Cook says "every project in WA should be subject to the same rigorous environmental approval system, but legacy issues mean Alcoa is yet to move to contemporary approvals.

"Alcoa is a major employer and contributes significantly to our regional economies, so it's important we safeguard local jobs while this transition to a modern approvals framework takes place," he added.

"This transitional framework allows us to support local jobs while strengthening protections for our environment, and lays the groundwork for a long-term approvals regime for Alcoa that meets modern standards."

WA Environment Minister Reece Whitby says the State Government has high expectations of Alcoa meeting its environmental obligations.

"We've made it clear to Alcoa that protecting Perth's drinking water remains paramount," he said.

"By allowing Alcoa to continue operating while limiting where it can mine, clear and explore, we are ensuring the State's high environmental protection standards are upheld." **AMR**



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# NATIONAL MINE WASTE CONFERENCE TARGETS BEST PRACTICE

**M**ining professionals and researchers from across Australia will converge in Brisbane, Queensland, on 6-7 February, to discuss the future of mine waste management.

The Australian Mine Waste Symposium, organised by the Sustainable Minerals Institute's (SMI) WH Bryan Mining Geology Research Centre (BRC) and the Geological Survey of Queensland, aims to produce an industry-wide roadmap to achieving best practice.

BRC's Mine Waste Transformation through

Characterisation (MIWATCH) research group leader Associate Professor Anita Parbhakar-Fox says there is widespread interest in addressing the challenges associated with mine waste.

"The complex environmental, social and economic challenges posed by mine waste are well known throughout the industry, particularly in the context of a global economy that will be producing more waste than ever to meet the growing demand for critical minerals," she said.

"Whether we've been at sites in WA, South

Australia or Queensland, the MIWATCH team has definitely seen growing interest in proactively addressing issues that we all know are coming.

"Through the Symposium we hope to consolidate the advances in practice and theory happening across the industry in environmental management, valorisation and reprocessing to produce a practical roadmap toward mine waste valorisation for Australia."

The Symposium will provide experts from a range of organisations and sectors a

platform to share their perspectives, experiences and research on mine waste management in Australia.

A critical object for the Symposium is the collaborative development of a roadmap that will help delegates introduce reforms to their organisations and embrace mine waste valorisation across the country.

To learn more about or register for the Symposium, visit <https://smi.uq.edu.au/news-and-events/conferences/australian-mine-waste-symposium>. **AMR**



Zero-waste boxes.

## NEW PPE WASTE MANAGEMENT INITIATIVE

**W**ith the surge in use of personal protective equipment (PPE) since COVID-19, a recycling program has been launched by Australian PPE producer Industree Group and global recycling company TerraCycle to reduce PPE waste at worksites nation-wide.

The Epicycle initiative features recycling boxes that are custom-designed for collecting used safety glasses, safety gloves and disposable respirators before they reach landfill.

TerraCycle ANZ general manager Jean Bailliard says PPE has traditionally been considered a hard-to-recycle waste stream because it consists of different kinds of complex, composite materials including hard and soft plastics, leather, and fabrics.

"For this reason, we are proud to join forces with Industree Group to provide a recycling solution for a waste stream which often ends up in landfill," he said.

"This initiative is a significant stride towards minimising PPE waste and accelerating the transition to a Zero-waste economy in Australia."

Industree Group chief executive Jon Flem-

ing highlights the importance of sustainability and responsible waste management.

"Sustainability isn't just good for the environment – it's the key to a brighter future," he said.

"By curbing our environmental impact, we're paving the way for a better tomorrow.

"Our commitment to sustainability is a genuine investment in a thriving future".

**AMR**



(Image source: TerraCycle) Secondary raw material after the recycling process.



# SPARTEL

REVOLUTIONISING SUSTAINABILITY IN THE MINING INDUSTRY

In an era of increasing environmental consciousness and regulation, the mining industry faces the pressing need for sustainable waste management solutions. Recognising this need, Spartel Pty Ltd emerges as a leading provider of innovative technologies and services tailored specifically for the mining industry. In business since 1996, Spartel has over 25 years of experience in the industry as experts in waste management and pollution control.

With a commitment to environmental responsibility, Spartel offers a comprehensive range of relevant solutions to address waste management challenges and promote sustainable practices.

## On-Site Organic Waste Composting Technology

One of the key technologies offered by Spartel is their state-of-the-art on-site organic waste composting technology. Designed to handle various organic waste streams, including food waste, green waste, and overburden, this ground-breaking technology enables mining operations to effectively manage their organic waste on-site. The composting technology comes with a remote access wireless process control system with a range of 2 km.

By implementing this composting system, mining companies can eliminate organic waste disposal to landfill, elimi-

nate vermin and odour, produce a richer product for mine site rehabilitation and prolong the life of the landfill leading to significant cost savings promote resource recovery, and contribute to a circular economy.

## Glass Bottle Crushers and Recycling Services

Spartel understands the significant volume of glass waste generated in the mining industry. To tackle this challenge, they provide innovative onsite glass bottle crushers that can achieve an impressive 80% volume reduction. These crushers are designed to efficiently process glass bottles, transforming them into manageable cullet for recycling.

Spartel also offers mine site glass recycling services, ensuring that the recovered glass is properly recycled and diverted from landfill, thereby minimising the environmental impact.

## Plastic Bottle/Container Shredders

In addition to glass waste, plastic bottles and containers pose a significant challenge for the mining industry. Spartel addresses this issue by offering advanced plastic bottle/container shredders, achieving volume reduction of an amazing 96%, making the plastics recycling process more efficient and cost effective. By implementing these shredders, mining operations can effec-



tively manage their plastic waste, promote recycling, contribute to a cleaner environment and achieve cost savings.

## Certified Organic Fertiliser

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FABert contains valuable nutrients free of chemicals. Spartel ensures product quality control.

## Odour Control Technologies and Products

Spartel provides advanced odour control technologies and tailored products for the mining industry, creating a pleasant working environment while demonstrating environmental stewardship. They offer a wide range of innovative solutions to address waste management challenges, helping mining companies comply with regulations and enhance their reputation as responsible corporate citizens. Spartel leads in environmental innovation, delivering efficient solutions for a greener, sustainable future in the evolving mining industry. **AMR**



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### Plastic Bottle/ Container Shredders:

Effectively process and manage plastic waste with Spartel's state-of-the-art shredders, contributing to a cleaner environment. We also provide shredded plastic collection and recycling services and lease arrangement for crushers.

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ASX logo on a phone.

# KALI METALS BEGINS TRADING ON THE ASX

**L**ithium explorer Kali Metals (ASX:KM1) has begun trading on the ASX following a \$15m initial public offering (IPO).

Under the IPO, 60m shares were on offer at an issue price of 25 cents per share, representing around 41.26% of company shares.

An Australian resources company, Kali Metals has a portfolio of lithium exploration projects across WA, NSW and Victoria.

Kali's portfolio comprises of the DOM's Hill, Marble Bar, Pear Creek, Higgsinsville, Jingellic and Tallangatta lithium projects.

Notably, Kali's WA lithium tenure is located adjacent to some of the world's largest hard rock (spodumene) mines and deposits.

Kali will use the money from the IPO to explore and develop its lithium exploration tenure, fund IPO expenses and listing costs, and fund general working capital.

Exploration is already in progress at Kali's WA lithium projects with results expected to be announced in January and an initial reverse circulation drilling program planned to begin at Higgsinsville in H1 2024.

Kali's board of directors comprises managing director Graeme Sloan, non-executive chairman Luke Reinehr and non-executive directors Paul Adams, John Leddy and Simon Coyle.

Mr Sloan says this is an exciting day for Kali Metals.

"It is a great time to become an ASX-listed lithium exploration company with activity in the sector high and the long-term fundamentals for the commodity strong," he said.

"With the emergence of lithium as one of

the most important critical minerals that will enable the global energy transition, this is an ideal time to provide investors with an opportunity to invest in a company with world-class projects in tier one locations.

"We are excited about the potential that our project portfolio offers shareholders and the role Kali can play in the future growth of the lithium industry." **AMR**

# POWER MINERALS EXTENDS URANIUM FOOTPRINT



**P**ower Minerals (ASX:PNN) has extended its footprint for uranium exploration via the grant of a new exploration licence at its Eyre Peninsula project in South Australia.

After geochemical portable x-ray fluorescence (pXRF) analysis of drill intervals detected possible anomalous uranium concentration, Power announced plans to explore the uranium potential of its Eyre Peninsula assets.

Consistent with its uranium exploration strategy, Power has been granted the Whichelby licence, which is located adjacent to its existing Cungenia licence.

Power plans to undertake modern air core drilling and advanced Vanta pXRF analysis to obtain real time, on-site uranium values — and other metals — in its maiden drill program a Whichelby.

To understand the uranium prospectivity, the different organic facies will be mapped to define the strategic intervals where

the best potential uranium reductant is developed.

Upon the grant of environmental approval and land holder agreements, first-pass drilling is planned for Q2 2024.

Power Minerals managing director Mena Habib said South Australia is very proactive in uranium exploration and mining.

"While we continue to develop the Salta lithium project in Argentina as our flagship project, the company is keen to further explore the uranium potential of its Eyre Peninsula project area, and the strategic addition of the Whichelby licence substantially expands our contiguous uranium prospective ground position," he said.

"We aim to uncover the uranium potential of our project area, which would add significant value to the project, at a time when demand for uranium continues to grow and there is appetite to bring new projects to market." **AMR**





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# START OF A GOODYEAR

## WITH HIGH-GRADE NICKEL CONFIRMED NEAR KAMBALDA, WA

**A**ssay results from Lefroy Exploration Limited's (ASX: LEX) diamond drilling program at the Goodyear nickel deposit near Kambalda in WA's Goldfields region have returned highly elevated values in hole GYD040.

The drillhole returned a highly elevated nickel intersection of 1.2m @ 10.01% Ni from 278.71m within massive to semi-massive sulphides.

Lefroy Exploration managing director Wade Johnson says the high-grade nickel intersection in the first hole of the program is a very good start to the exploration campaign at Goodyear.

"The intersection in GYD040 is one of the highest grade intervals of nickel mineralisation known at Goodyear, with our first drillhole intersecting massive sulphides on target and as modelled," he said.

"This further demonstrates and supports the quality of previous drill information.

"Our expectation is that the host ultramafic

in Location 45 will provide the opportunity to expand beyond the current resource of almost 15kt Ni at Goodyear and grow to become a new nickel district near the prolific Kambalda nickel camp."

Workers at Mt Martin



### GOLD MINERALISATION EXTENDED AT MT MARTIN

Gold mineralisation has been extended at Lefroy's Mt Martin gold mine in WA.



Drilling at Goodyear nickel deposit.

Drill core with significant intersections at Goodyear.



As part of the company's maiden resource expansion drilling program, 29 reverse circulation (RC) holes were drilled to evaluate multiple extensions at depth and shallow gold-bearing shear structures.

Holes on the west side of the open pit targeted the northwest plunging ore shoots which are a feature of high-grade mineralisation at Mt Martin.

Best results include 35m @ 1.78g/t gold from 209m including 10m @4.32g/t gold from 222m, and 3m @3.74g/t gold from 128m.

Mr Johnson says the company is delighted with the results.

"We are delighted with the results from the recent drilling program at Mt Martin and now have a high degree of confidence in the geological model, with drilling confirming the main shears of consistent structures controlling mineralisation," he said.

"The program has also identified new shallow gold mineralisation in the underexplored area immediately east of the open pit, which will now be a priority focus for follow-up drilling to provide an additional source of shallow open pit mineralisation." **AMR**

## MAIDEN DRILL PROGRAM PLANNED FOR SANDOVER

**A** maiden drill program has been planned for Tivan's (ASX:TVN) Sandover project in the Northern Territory.

Covering an area of around 8000km<sup>2</sup> across two contiguous blocks of exploration licences, Sandover is considered to be prospective for lithium-bearing pegmatites.

Previous surface sampling undertaken by EARTH AI identified five new prospects, including a copper target with tungsten and bismuth enrichments, and four lithium targets with potential for lithium-caesium-tantalum style mineralisation.

Three of the targets have been prioritised

to be tested in this upcoming drilling program and include a zone of copper-rich epidiosites, a highly differentiated pegmatite and an epithermal proto-porphyry system.

To support this drilling program, Tivan is finalising an application for Round 17 of the Northern Territory Government Geophysics and Drilling Collaborations program. Tivan executive chairman Grant Wilson said the company is pleased to begin its maiden drill program at Sandover.

"In less than a year, Tivan has secured clean title, onboarded EARTH AI in an exploration alliance, identified highly prospective targets, designed a maiden drill campaign and progressed relevant permissions with



Close up view of drill rig.

Traditional Owners, pastoral lease holders and the Northern Territory Government," he said.

"We are firmly on this track, and excited to be on the cusp of delivering results at a highly prospective greenfield project in the Territory."

Prior to any drilling beginning, the Northern Territory requires a Mine Management Plan to be submitted and pending successful approvals, drilling is expected to start in early Q2 2024. **AMR**



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 12m<sup>3</sup> 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 10m<sup>3</sup> 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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(Image source: Mineral Resources) BrijarCass project manager Hayley Hayes with Mineral Resources chief executive, iron ore Chris Soccio.

# MINERAL RESOURCES CONTRACT

## INDIGENOUS-OWNED BUSINESS FOR FIFO RESORT

**M**ineral Resources (MinRes) has contracted an Indigenous-owned business to provide its services for WA's first fly in, fly out (FIFO) resort.

Under the four-year contract, BrijarCass Security will initially provide utility services at the 500-room Ken's Bore Resort in the Pilbara which is being constructed as part of MinRes' flagship Onslow Iron project.

Established in 2010, BrijarCass provides employment opportunities for Indigenous people with a particular focus on Thalanji and other local Indigenous people.

The contract with MinRes will support the company's growth with at least nine jobs to be created to boost the team.

BrijarCass project manager Hayley Hays said this is a great opportunity to grow the company.

"We are looking forward to expanding and can't wait for the future, which is looking really bright," she said.

"We are currently recruiting for people to join our team to provide utility services at Ken's Bore mine site and strongly

encourage Indigenous people to apply."

The residences will feature resort-style accommodation, including Olympic-size swimming pools, fitness facilities and a la carte dining.

The apartment-like rooms – known as pods – will be three times the size of traditional FIFO accommodation and feature a queen-sized bed, laundry, ensuite and a balcony with a barbecue.

The pods were designed for singles or couples and aim to encourage a more

diverse workforce at Australia's newest iron ore project.

Mineral Resources general manager of communities and heritage Heath Nelson said the contract is an example of the company's commitment to partnering with Indigenous businesses.

"MinRes is committed to supporting Indigenous companies and building long-term relationships with tangible outcomes," he said. **AMR**

# LEADERSHIP CAPABILITY IN MINING WHS



(Image source: ECU) Joondalup campus.



(Image source: ECU) MARS centre director and professorial chair of mining work health and safety at ECU's School of Business and Law professor Tim Bentley.



(Image source: ECU) MARS course coordinator Dr Esme Franken.

**E**dith Cowan University (ECU) and the WA Government's Mental Awareness, Respect and Safety (MARS) program have launched a new graduate certificate of leadership in mining workplace safety.

This course will enhance work health and safety (WHS) leadership capability and elevate the culture of safety and respect in the sector.

It will consist of three units, with the first focusing on mining work health and safety, developed in partnership with ECU's School of Medical and Health Sciences.

The second unit — Leading Respect at Work — is focused on workplace culture,

barriers to respect at work and new legislation around psychosocial hazards in the workplace.

The final unit — Managing People and Organisations — is an existing unit with ECU's Master of Business Administration course which has been adapted and refined for the mining industry.

MARS course coordinator Dr Esme Franken says the course is aimed at enabling current and emerging leaders to advance initiatives around mentally healthy and safe workspaces in the resources sector.

"We are also focusing on sexual harassment as well as bullying, which were flagged as major causes of concern in the

mining sector over the past few years, including in the Enough is Enough and Respect at Work reports," she said.

"Underlying this all is the goal of evaluating leadership capability within the mining sector and to advance and champion safe and respectful workplaces in the industry."

The MARS Centre is an ECU industry collaboration specifically aimed at creating mentally healthy workplaces, building a culture of safety and respect, as well as preparing for workplace safety in future mining operations.

MARS centre director and professorial chair of mining work health and safety at ECU's School of Business and Law pro-

fessor Tim Bentley says the new course is unique amongst currently available ones.

"The sector is still coming to grips with the issue of psychosocial risk," he said.

"Mining organisations have the challenge of managing these issues from a risk-based approach.

"That will be addressed during this course, and students will be empowered to lead a mentally healthy and respectful workplace.

"The more leaders and future leaders that go through this course, the bigger the shift will be in culture." **AMR**



# No more mess with the FLANGELOCK TOOL FROM CKC EQUIPMENT



**T**rust CKC Equipment to supply you with the FlangeLock Tool, an ultimate contamination control tool for protecting any hydraulic system.

Produced in the US, the FlangeLock Tool is an easy-to-use cap which slides over the flange and is sealed by tightening the bottom plug by hand, keeping oil in and contaminants out.

CKC Equipment imports the FlangeLock Tool into Australia and sells it nationwide through the company's extensive network of distributors.

Greg Molloy, inventor of the FlangeLock Tool, needed a solution to using plastic bags and rags when preventing contamination and leaks, and so created a prototype which eventually led to manufacturing what is now known as the FlangeLock Tool.

With an easy on, easy off process the FlangeLock Tool offers a leakproof solution to hydraulic system and environmental cleanliness that is guaranteed to stop the mess and reduce the need for expensive clean ups.

The reduction in oil leaking from hoses also

drastically reduces the risks associated with slip and fall hazards, resulting in a large benefit to staff safety as well as a decreased chance of environmental contamination.

The FlangeLock Tool can be used across a breadth of industries including construction, mining, oil fields, dredging applications, wind turbines and large machine tools.

Currently manufactured in lightweight aluminium, it is produced in 12 sizes for 8, 10, 12, 16, 20, 24, 32, 40, 48, 56 and 64 in SAE Code 61, 62 and CAT.

Other advantages of the FlangeLock Tool are that no tools or expensive hardware are required while rags stuffed into hoses and messy plastic caps are a thing of the past.

Installation and use is quick and easy, requiring just one hand, with no additional equipment required. **AMR**

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# SANDVIK

## RECEIVES LARGEST EVER SURFACE DRILL RIG ORDER



(Image source: Sandvik) Sandvik drill rig.

**S**andvik has received its largest ever order for surface drill rigs from US-based Sandvik dealer Country Boy Supply, valued at \$36m (SEK 248m).

The order consists of 34 surface drill rigs which will replace Country Boy Supply's current contractor fleet in Georgia and Tennessee.

The order includes 16 Leopard DI650i drills, six Leopard DI550 drills, five Pantera DP1600i drills, three Ranger DX800 drills, three Ranger DX700 drills and one Pantera DP1500i drill.

Automation will play a key feature in the fleet upgrade as part of the new rigs will be equipped with Sandvik AutoMine.

AutoMine is a cutting-edge tele-remote solution that enables operators to remotely and simultaneously control and supervise multiple automated Sandvik underground drills and increase efficiency, productivity and safety.

It includes ring-to-ring tramming capabilities, allowing seamless control and coordination of drills, loaders and trucks oper-

ating in the same area with sophisticated traffic management.

These rigs will be used for production drilling in various large quarries or open pit mines, as well as construction work sites.

Sandvik Mining and Rock Solutions president Mats Eriksson commented on the order.

"We are very pleased to deepen our partnership with Country Boy Supply and deliver the most productive and powerful

surface drill rigs available to upgrade their fleet," he said.

"This partnership will further strengthen our position in the surface drilling solutions market."

Deliveries are scheduled to begin in the first quarter of 2024. **AMR**

## FORTESCUE DEBUTS AUSTRALIA'S FIRST ELECTRICAL EXCAVATOR AT CLOUDBREAK



(Image source: Fortescue) Australia's first electric excavator in operation at Cloudbreak, the Liebherr 9400E.

**A**ustralia's first newly built electric excavator is now in operation at Fortescue's (ASX:FMG) Cloudbreak mine in WA.

Powered by a 6.6kV substation and more than 2km of high voltage trailing cable, this is the first of three R 9400 E electric excavators being delivered by Liebherr.

Fortescue chief executive Dino Otranto says the commissioning of the excavator is a milestone for the company.

"The commissioning of this fully electric excavator is a massive achievement by the team and is the first of its kind in Australia for the mining industry," he said.

"It's a true demonstration of industry collaboration where we've been fortunate enough to work with industry experts who have been using trailing cable for decades, and then repurpose this in our own operations as part of our decarbonisation journey.

"Already, our Chichester operations, which include Cloudbreak, run partially off solar enabling this first excavator to be powered using renewable electricity.

"Once we decarbonise our electricity grid,

all these excavators will be operating on renewable electricity in the future."

The delivery is the electric excavators demonstrates FMG's and Liebherr's strong commitment to decarbonising heavy industry.

In line with FMG's aim to eliminate emissions across its mining operations, the company is aiming to have all electrified mining equipment eventually powered by renewable energy.

Liebherr Australia managing director of mining Trent Wehr commented on the beginning of operations.

"This R 9400 E excavator marks a significant milestone, with our decarbonisation partnership with Fortescue now extending to electric excavators," he said.

"The debut of Australia's first operational electric excavator is a big achievement for our local team who will provide ongoing service and support for these machines.

"Our local teams are actively enhancing their skills to keep pace with the changes that accompany our expanding line-up of zero emission mining equipment, and we're excited to see what the future holds." **AMR**



# BHP XPLOR

## ANNOUNCES SECOND ACCELERATOR PROGRAM

**B**HP (ASX:BHP) has announced its second group of six companies to join the BHP Xplor accelerator program.

The accelerator program is designed to support early-stage mineral exploration companies in finding the critical resources needed to support the energy transition.

It aims to support development across technical, business and operational aspects of the participating companies.

Furthermore, BHP Xplor provides BHP the opportunity to access some of

the world's most exciting exploration prospects, enhancing the pipeline of new opportunities which may shape the company's future asset portfolio.

Each of the six companies will receive a grant of up to \$760,803 (US\$500k) plus access to a network of internal and external industry experts to accelerate growth and build exploration concepts.

Over the six-month program, the six companies will work together with BHP Xplor to speed up the maturation of their geological concepts to position the projects for commercialisation or partnership.

BHP Xplor's Charlee Johnson commented on the program.

"The diversity and quality of the submissions amongst the applicants is amazing and inspiring," she said.

"We are excited to partner with the selected cohort and help bring their ideas and passion for their exploration projects to life.

"We aim to accelerate this process and create disruptive results by identifying new concepts, data and testing opportunities."

The six selected companies are Longreach

Mineral, East Star Resources, Pallas Resources, Hamelin Gold, Cobre and Equivest Minerals.

BHP Exploration and Xplor vice president Sonia Scarselli said companies need to meet energy transition.

"Exploration for critical resources is moving slowly, but to meet the needs of the energy transition we must move at pace," she said.

"We will be working together with the 2024 cohort to accelerate exploration in new geographies and advance new geologic concepts." **AMR**



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# Celebrating HALF A CENTURY IN OPERATION

(Image source: BHP) Queensland Coal comprises the BHP Mitsubishi Alliance (BMA) assets in the Bowen Basin in Central Queensland.

**S**araji is an open pit metallurgical coal mine near Dysart in Queensland's Bowen Basin.

It is one of Australia's largest mines by recoverable resources and celebrates its 50th anniversary of operations this year.

First opened in 1974, Saraji is a part of BMA, the 50:50 joint venture between BHP and Mitsubishi Development.

BHP Group's share of production in FY23 was just under 4.6mt.

#### Team Saraji

As part of a series of articles featured on BHP's website celebrating Saraji's 50 years since commissioning, Saraji general manager Glenn Kirkpatrick was interviewed about the importance of the mine to the local community.

"Our people are the backbone of this operation, and that is why we come to work every day," he said.

Mr Kirkpatrick credits "Team Saraji" with increasing the scale and capacity of the mine over the last 50 years.

"Saraji is an operation with a strong connection to Dysart," he said.

"We have a number of families working here – brothers, sisters, aunts, uncles.

"We have had generations of families who are part of Team Saraji.

Mr Kirkpatrick says the people of Team Saraji have an inbuilt resilience and ability to think outside-the-box to keep the mine sustainable and safe for future generations.

"If I think about what we do now, and the change that this mine has undergone, it's truly remarkable," he said.

"The mine is now a 9.5–10mt operation.

"140m<sup>3</sup> of overburden is moved to get those product tonnes out of the ground."

#### Smart Transformation Project

Thinking about the future of Saraji, Mr Kirkpatrick says the Smart Transformation project is shaping the future of Dysart.

The Smart Transformation project, a BMA-supported, community-driven initiative, aims to future-proof the towns such as Moranbah and Dysart in the face of technological change.

"We're really proud of the work that the mine and the community are doing together to get this region ready for the fourth industrial revolution," he said.

The project began in 2019, as the community saw the increasing application of new technologies at local mining operations, including BMA's Goonyella Riverside mine which introduced autonomous haulage trucks (AHS).

At the heart of Smart Transformation are the Smart Transformation Advisory Councils, of which BMA's Saraji mine general manager sits on the Dysart advisory council and the Goonyella Riverside mine general manager sits on the Moranbah advisory council.

Both are also involved in working with the Smart Transformation Youth Advisory Council which operates to ensure there is a youth voice to the project, through participation from local high school students.

Mr Kirkpatrick believes Team Saraji shows an excellent base for continued growth as a low-cost, safe producer of high-quality metallurgical coal.

#### Production Updates

Quarterly production for Saraji in Q1 FY24 was 1,010kt, falling to 701kt in Q2 FY24.

BMA's production overall for the most recent quarter was lower due to significant increase in planned maintenance across the asset, the extended longwall move and geotechnical faulting which impacted underground operations at Broadmeadow until early November.

Production was also impacted by an increase in prime stripping to improve value chain stability following depleted inventory positions arising from extended weather impacts and labour constraints over recent years.

In HY24, production was 11.3mt, down 17% from 13.6mt in HY23.

BMA production guidance has been lowered to 23-25mt (46-40mt at 100%), excluding Blackwater and Daunia from the expected sale completion date of 2 April 2024.

On 15 January, a team member from BEP Engineering & Maintenance, a contracting partner to BMA, was fatally injured in a vehicle incident at Saraji mine.

BHP chief executive Mike Henry says "our deepest sympathies are with their family, friends and colleagues in this difficult time".

"We are committed to learning from this strategy and investigations into the incident are underway," he said.

#### Saraji East Mining Lease Project

BMA is seeking approval to develop the Saraji East mining lease project involving a single-seam underground mine and supporting infrastructure on Mining Lease Application (MLA) 70383 and MLA70459.

The project will be accessed through the existing Saraji mine open cut void within ML 1775, directly adjacent the proposed project.

Other proposals include a new transport and infrastructure corridor, a new coal handling and processing plant (CHPP) and associated Mine Industrial Area (MIA) and a new rail spur and balloon loop.

The project is expected to produce up to 8mtpa of metallurgical (coking and pulverised coal injection) product coal for the export market over a production schedule of 20 years.

It is anticipated that 1000 jobs will be created during construction and 500 jobs maintained during operations.

#### Other Facts

Saraji mines the Moranbah coal measures, blending from up to 11 coal seams.

Production at Saraji South (formerly Norwich Park) ceased in May 2012.

Since October 2022, limited product has been sourced from Saraji South for processing at Saraji.

A small proportion of BMA's production is sold as energy coal.

BMA has access to infrastructure, including a modern, multi-user rail network and owns and operates its own coal-loading terminal at Hay Point, near Mackay in Queensland.

BMA has contracted capacity at two other multiuser port facilities – the Port of Gladstone (RG Tanna Coal Terminal) and Dalrymple Bay Coal Terminal (DBCT).

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IT TAKES ABOUT  
770KG OF  
METALLURGICAL COAL  
TO MAKE 1T OF STEEL.





*Drives and Controls Services would like to congratulate Team Saraji on their 50 year Anniversary and wish them ongoing success!*

# PROVIDERS OF QUALITY ELECTRICAL, CONTROL SYSTEM AND AUTOMATION ENGINEERING SERVICES

For over 30 years, Drives and Controls Services (DCS) has provided high quality electrical, control system and automation engineering services as well as on-site maintenance support throughout Queensland and New South Wales.

Specialising in the mining industry, our dedicated team of Engineers and Service Technicians develop application enhancements for conventional electrical systems that lead to increased productivity and machine availability for mining excavators and CHPP's.

DCS upgrades also include excavator system controls, operator ergonomic concerns, power system voltage stabilisation, and web-based production monitoring all in the pursuit of increased production and reduced maintenance costs for our client's existing mining equipment.

By closely analysing equipment downtime events, we identify opportunities for improvement and use this data to review maintenance strategies to ensure inspections are conducted at the correct

intervals using replacement components equal or better than the recommended OEM standard.

By conducting root cause analysis of issues, we recently uncovered that draglines were regularly failing to pass main motion automated brake tests.

After thorough testing, we were able to offer a solution that ensures consistent passes during brake testing. Through our experience we solved an industry wide issue helping to increase machine up time, reduce ongoing maintenance costs, and significantly improve machine safety.

We at DCS are proud of the way we build strong relationships with our clients and work closely with both production and maintenance personnel on-site.

This collaborative approach allows us to identify issues proactively and correct them during the scheduled maintenance environment. For nearly 10 years we have worked closely with the Saraji CHPP team by planning & executing MCC

replacements, PLC & SCADA upgrades, replacement of obsolete electrical components and various other electrical upgrades during major shutdowns.

DCS provides on-site commissioning for the electrical works, and we have remote access to the control system with a DCS engineer on-site each week in a support role to the maintenance personnel. Furthermore, DCS is offers 24/7 coverage for breakdowns where required.

Through the tireless efforts of both the DCS and Saraji teams we are proud to have played an integral role in reducing the plant's electrical downtime from days each year to mere hours.

Looking to the future we are proud to be playing a lead role in bringing Saraji's state-of-the-art Training Centre to life. In 2023, Saraji Mine's field maintenance team approached DCS with the idea that machine specific training should be reinstated at a site level.

The goal was to ensure that their

employees can learn and develop skills to a level that satisfies the individual's personal development goals, Saraji Mine's company goals and to improve machine reliability by reducing fault diagnosis times.

The Saraji Mine Field Maintenance Training Centre will be the home of multiple custom-made training simulators where both apprentices and tradespeople can learn the theory behind the workings of a dragline's drive and control systems and get hands on practical exposure to the equipment in a safely controlled low-pressure environment.

The centre will also be home to multiple training aids that will assist electrical apprentices in preparation for their fourth-year capstone assessments.

The team at DCS values the strong working relationship we have had with the Saraji personnel over many years, congratulate them on their 50-year Anniversary, and look forward to being part of their ongoing success. **AMR**

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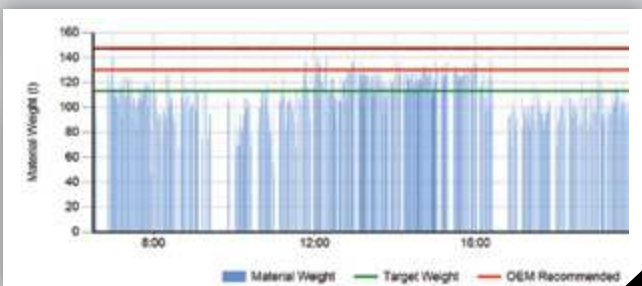
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# ELECTRICAL SWITCHBOARD SPECIALISTS



**F**amily-owned business Metroid Electrical Engineering specialises in the manufacture of electrical switchboards for industrial automation and motor control. Metroid was established in 1993 as a specialist electrical manufacturer to Australia's Department of Defence and in the last 15 years has become a critical supplier to many of the country's key infrastructure and mining projects.

With more than 70 talented staff across the company, Metroid is a complete one-stop shop for switchboards including engineering and design, sheet metal manufacturing, board assembly and wiring, PLC and HMI programming, and onsite commissioning.

Metroid's customers rely on the company to deliver rock solid, fully compliant switchboards for the mining sector's tough applications. This is backed by the company's experienced engineering team, cutting edge manufacturing and superior technical support.

"Our vision is to become the most advanced industrial switchboard manufacturer in Australia," Metroid managing director Jeff Weeks said.

"We're not an electrical contractor that happens to build boards: we're a specialist engineering and manufacturing company

who continually invests in cutting-edge automation and manufacturing processes to deliver fully compliant switchboards of the highest quality."

## Metroid Difference

What sets Metroid apart from its competitors is that they offer all critical processes under one roof — from engineered design to sheet metal manufacture, powder coating, assembly and wiring, and PLC/HMI programming.

Metroid is ISO9001 certified and takes quality assurance very seriously. There are stringent quality control procedures in place and thorough functional and power testing processes to ensure the highest possible quality construction.

"Our customers can trust us to deliver a well-engineered, well-built switchboard complete with programming, completely eliminating blame games and scope arguments between contractors," Mr Weeks said.

"Our experience with dozens of different mine sites gives our customers confidence that we're all over the specifications and unique requirements of some of Australia's harshest environments.

"Safety and durability are obviously imperative in mining projects; our team takes

great pride in delivering the quality and attention to detail that's needed in such harsh environments."

Once an estimate has been made regarding the costing and work needed, Metroid's team creates a full drawing pack which includes schematics and layouts for client approval prior to construction.

Laser cutting, folding, welding and powder coating is then completed in-house with all switchboards wired by skilled electricians and apprentices using Metroid's proprietary wiring automation systems.

The switchboards are then programmed and before they leave the factory, every switchboard is powered up and put through a series of rigorous tests and checks.

## Saraji Work

Since 2015, Metroid has completed various switchboard projects at BHP's Saraji mine in Queensland's Bowen Basin.

Metroid's first scope of work at the project included three sewage pump station switchboards. These controlled the pumping of effluent from multiple locations around the mine plant and back into the central sewage treatment plant.

To ensure the smooth transfer of sewage

across the site, the boards were integrated into the new STP motor control centre. Metroid completed the design, engineering and manufacturing of all pump station switchboards for the project.

A few years later in 2020, Metroid was engaged once again to build a full switchboard set for a new sewage treatment plant. This was an upgrade to the existing plant.

Work Metroid has completed included electrical design and engineering, switchboard construction and PLC/HMI programming of a large Form 4A MCC, local control station, junction boxes and local HMI panels.

Besides working with BHP, Metroid has worked with other mining companies including Rio Tinto, Fortescue, Roy Hill, Glencore, Agnico Eagle, Anglo American, Iluka Resources, Newcrest and Gold Fields.

The company has also completed projects in other mines and processing plants across the globe in Africa, Europe and South America.

**For more information, visit [metroid.net.au](http://metroid.net.au), call 03 5442 5444 or email [enquiries@metroid.net.au](mailto:enquiries@metroid.net.au).**

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**D**ura Vision Lighting, a division of Ultra Vision Lighting Pty Ltd, is a cutting-edge company dedicated to illuminating the world with advanced LED lighting solutions. For the past six years, Dura Vision Lighting, formally known as Leitech, has been supplying BHP Saraji with specialised high-performance LED lighting technology that is designed and made in Australia. In February of 2023, Ultra Vision Lighting successfully purchased Leitech Australia.

At Dura Vision Lighting, we have leveraged state-of-the-art engineering and design to develop a diverse range of lighting solutions, catering to the mining and heavy industrial sectors. Whether it's illuminating challenging terrains or providing robust lighting solutions for industrial applications, our products have been crafted to exceed expectations.

Being an Australian owned and manufacturing company, our commitment to quality is next to none, ensuring that each Dura Vision lighting product undergoes rigorous testing to meet all standards.

From high-performing flood lighting to compact, robust work lighting, our comprehensive product line reflects our dedication to pushing the boundaries of lighting technology.

In addition to our focus on product excellence, we prioritise environmental sustainability. Many of our LED solutions are energy-efficient, contributing to a greener future without compromising performance.

Our specialised dragline lighting bracket was specially designed and engineered for Saraji Mine. Also designed and engineered

was the modular bracket system, which was dramatically reduced in weight so it could be carried up the dragline boom if required.

This enabled installation to be simplified, and quicker for the maintenance team.

Another fitting used by the mine is the Cyberlite, a cylindrical batten light which serves as a replacement to the traditional fluorescent batten lights.

The Cyberlite has been used on both draglines and shovels due to its robustness and durability.

Our mission is to enhance visibility, safety, and efficiency for our customers, providing top-tier lighting products designed to meet the most demanding requirements.

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- Mickala have long standing contracts based on performance, product and capability.
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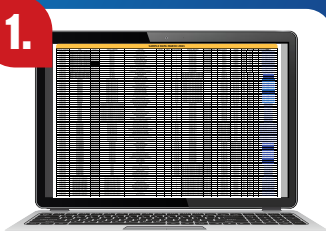
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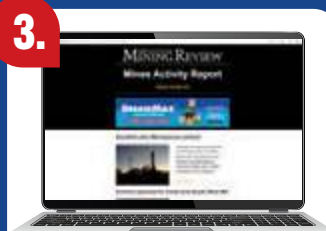
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**9**

**VITAL TOOLS TO  
GROW YOUR  
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# THE **INSPEC** APPROACH

(From left to right) Rod Allen – Managing Director, Stacey Drosd – Chief Financial Officer, Darren Fitzgerald – General Manager and Rod Wilson – Health, Safety & Training Manager.



**I**ndustry-leading repair and maintenance company Inspec Industries provides efficient and quality mechanical solutions to its range of clients.

Based out of Dysart and Mackay in Queensland, Inspec's field service team expands across the State, offering heavy equipment support ranges from maintenance, repairs, blast and paint, rebuilds, labour hire and product sales.

The company also offers original equipment manufacturer services which are cost effective and completed to a high standard.

Backed by a knowledgeable and dedicated team, Inspec delivers highly time and cost-efficient equipment and product support to all clients.

## Mackay Workshop

Housing its main office, Inspec's Mackay heavy workshop specialises in small to large heavy earthmoving equipment repairs and component rebuilds.

The workshop offer midlife to full overhauls on equipment such as CAT 777-793, off road haul trucks, CAT D7-D11 track dozers, CAT 16-24 graders, Komatsu 830 and CAT 6060 excavators.

Mackay services include boiler making repairs and fabrication, blast and paint services, mechanical repairs, overhauls, equipment air conditioning and auto electricians.

## Dysart Workshop

Inspec's Dysart workshop has multiple light to medium vehicle workshop bays to

cater for all vehicle needs, and while this is the focus, the workshop has the ability to overhaul heavy equipment on site.

Additional services include servicing and repairs, panel and paint, tyres, towing and transport.

This support helps keep you, the community and mine sites moving.

## Blast and Paint

Located inside its Mackay workshop, Inspec's blast and paint division offers both abrasive blasting and industrial spray painting. No matter the size of your equipment, Inspec has the ability to repaint it all.

The blast and paint booths are manufactured in accordance with requirements outlined in AS 4114 parts 1 and 2 (2003)

and AS 3000:2000. The booths also feature a fall arrest system, allowing technicians to work safely and efficiently on all machinery.

## Field Service

Inspec's field service technicians offer onsite maintenance, servicing and breakdown assistance with around the clock support and a local mechanical workshop.

Equipped with their own field service vehicles, Inspec technicians are available for on-call assistance diagnosis and repair.

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## Services include:

- ✓ Maintenance
- ✓ Blast and paint
- ✓ Labour hire
- ✓ Repairs
- ✓ Rebuilds
- ✓ Product sales

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# PROOF OF CONCEPT:

## HIGH-VOLTAGE COUPLERS BOLSTER BMA SARAJI MINE



AusProof's high voltage aluminium couplers, now standard with the LED Live Line Indicator.



Assembly of AusProof's 1.1kV Stainless Steel Back-to-Back Receptacles.

AusProof played a pivotal role at the BMA Saraji Mine, deploying advanced high-voltage couplers especially designed to withstand the rigorous demands of mining environments.

The contribution by the AusProof team extended beyond its expertise in equipment supply and installation.

Skilled technicians and engineers well-versed in mining electrical systems and high-voltage equipment also ensured proficient equipment handling and maintenance.

AusProof managing director Aston Marks says the company is committed to innovation.

"It's important for AusProof to push boundaries and develop new manufacturing methods in order reduce costs and ultimately allow us to pass this cost-saving on to the customer," he said.

An integral component of AusProof's engagement was implementing a robust Research and Development (R&D) program focused on advancing safety and technology at the BMA Saraji Mine, leading to the development of more efficient and safer electrical solutions for the mining industry.

One notable achievement was the substantial improvement in BMA Saraji Mine's efficiency, with AusProof's couplers increasing site electrical system safety, leading to long-term cost savings and a lower environmental impact.

Established in 1994, AusProof is a family-owned business specialising in high and low voltage cable coupler solutions in both aluminium and stainless steel, with on-site facilities supporting in-house testing and continuous R&D work.

State sales representatives nationwide conduct regular site visits, ensuring clients

receive unparalleled care and satisfaction beyond the point of sale.

For three decades, AusProof has partnered successfully with top mining companies, enhancing safety and productivity with state-of-the-art products and services around the globe.

Its high and low voltage solutions are currently installed in approximately 30 mines around Australia, in all types of remote conditions.

"Hopefully the industry feels honoured that our little company is just in their backyard," Mr Marks said.

"We're proud of it and hopefully they can be proud of it too."

AusProof's R&D team has led to the development of world's only 35kV coupler and the release of other new products to the Australian market:

- single piece contacts preventing hot joints across our high and low voltage ranges;
- the removable flange, which takes the guesswork out of high-voltage flamepath maintenance; and
- the restrained aluminium range (the lightest Non-Ex products on the market).

AusProof's comprehensive approach, marked by innovation and commitment, yielded improvements in operational efficiency, safety standards and cost-effectiveness at the BMA Saraji Mine through the provision and installation of high-quality products, customer support and training, as well as the development of an R&D program that significantly enhanced safety and technological aspects. **AMR**



# High and Low Voltage Cable Coupler Solutions



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Since 1994 AusProof has been committed to providing the industry with cable coupler solutions of the highest possible quality. Manufacturing high and low voltage products in both aluminium and stainless steel to suit your operational needs, AusProof is dedicated to increasing site safety, productivity and efficiency, creating long-term cost savings, and reducing downtime.



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# ROCK SOLID:

## CAPCOAL COMPLEX GOING FROM STRENGTH TO STRENGTH

By Ashleigh Dorrell

**P**roducing more than 8mtpa of prime quality metallurgical coal, the Capcoal complex comprises of one underground mine — Aquila — plus two open cut mines — Lake Lindsay and Oak Park.

Located in the heart of Queensland's renowned Bowen Basin region and around 25km southwest of Middlesbrough, these sites are an important economic asset to the economy and provide steel for a variety of uses, including construction, appliances, automotive and mechanical equipment.

Held in a joint venture between Anglo American (70%) and Mitsui Resources (30%), open cut operations at Capcoal began in 1981 with underground mining beginning in 1988.

### Lake Lindsay Expansion

In mid-November 2023, the Queensland Government cleared the Lake Lindsay mine for expansion – extending the life of the mine and securing the long-term future of 500 jobs.

Queensland Resources Minister Scott Stewart says the expansion shows there's confidence in the State's resources industry.

"It [the granting] shows there is confidence from major mining companies that are investing in the future of Queensland's resources industry into the future," he said.

"Steel-making coal is one of our State's biggest export earners, worth nearly \$60b in the 12 months to May this year [2023].

"We need steel for construction, domestic appliances, automotive and mechanical equipment, and also for turbines to generate renewable energy on wind farms."

The expansion will allow Lake Lindsay to continuously provide significant contributions to government income taxes and royalties.

Since 2015, Capcoal has steadily increased royalties and public rates paid to the Queensland and Australian governments.

The expansion will also have flow-on economic impacts such as increased spending in the area, continued employment and training opportunities, and continued spend to local groups and organisations.

When fully operational, the expanded mine will produce 5.6mtpa of steel-making coal.

### Operations Start at Aquila

In February 2022, Aquila achieved its first longwall shear of steelmaking metallurgical coal on schedule, extending the life of Anglo American's underground operations by seven years to 2028.

The mine features two longwalls which allows Anglo American to operate without the downtime that is needed for longwall moves.

Both longwalls are fully remote capable and will be operated from the site-based remote operations centre on the mine's surface.

Anglo American chief executive of metallurgical coal at the time Tyler Mitchelson said the milestone was achieved after a successful ramp up to longwall operations.

"During Aquila's construction phase, the project provided employment for around 1200 people, and the majority of supply contracts were awarded to Queensland-based suppliers, including for longwall equipment, technology and civil works," he said.

"Aquila mine has been developed as one of Australia's most technologically advanced underground mines, leveraging Anglo American's advancements in underground automation technology, remote operations and data analytics.

"Remote operations present us with the single biggest opportunity to improve

safety by removing people from harm's way."

Aquila will have a total average annual saleable production of 5mt of premium quality hard coking coal.

### Aquila Wins Big

Around 18 months later in November 2023, the Aquila mine took home a top award at the Australian Mining Prospect Awards. The mine won the Outstanding Mine Performance category for its ground-breaking technology advancement to minimise human presence in underground areas.

Featuring two longwall systems, both are fully remote capable from the site-based Remote Operations Centre (ROC) on the surface of the mine – reducing exposure to underground areas by about 15,000hpa. Aquila general manager Shane McDowall says the transition to remote operations established an unparalleled model of safety and stability.

"Currently achieving 100% of remote-operated longwall shears per week from its ROC, the mine boasts an industry-first suite of automation systems and an intricate camera network," he said.

"These components harmonise seamlessly to guide coal cutting with unparalleled precision and efficiency.

"This strategic move eliminates the need for human presence in hazardous environments, marking a significant step toward minimising potential exposure."

Anglo American Australia chief executive Dan van der Westhuizen said at the time safety, innovation and sustainability were critical to Queensland's mining future.

"The primary aim of implementing remote operations in the context of longwall mining is minimising personnel exposure on the longwall, preferencing operations from surface-based control rooms," he said.

(Image source: Anglo American) Underground at the Aquila mine.



(Image source: Anglo American) Workers at Aquila's remote operated centre.



(Image source: Anglo American) Capcoal's rope shovel.

"By combining state-of-the-art technologies with a collaborative approach, the mine has emerged as a leader in the industry, reshaping the future of underground coal mining on a global scale." **AMR**



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Since its establishment in 1991, Osmoflo has specialised in the design, build and operation of over 600 reverse osmosis desalination plants, as well as operating and maintaining around 100 desalination plants on behalf of clients, customers and partners.

### Example of a Customised Project Solution

Located in Bowen Basin, Central Queensland, the Capcoal Mining Complex — which is owned by Anglo American — consists of a group of surface and underground coal mines which extract high quality metallurgical coal.

It comprises of several mines, including the recent expansion to Lake Lindsay and underground operations at the Aquila mine.

Since mining activities began 1981, Capcoal operations have managed the site water inventory by using significant available onsite storages as required in order to balance the rate at which excess mine affected water (MAW) is produced.

Osmoflo's General Manager of Strategic Growth, Scott Chalmers, commented on how the partnership came about:

**“Due to significant droughts experienced between 2015 – 2019, and the business-critical requirement to secure high quality fresh water supplies to support the new Aquila underground mining operations and given the global corporate sustainability goals — Anglo engaged Osmoflo to deliver a containerised water treatment facility to convert the available MAW into high quality water for direct use underground and by surface operations as required,”** he said.

Delivered in two stages, an emergency rental plant was delivered initially under a collaborative model on a fast-track basis — capable of treating up to two million litres per day.

The water produced from this rental treatment facility was used in the construction and commissioning phases of the longwall at Aquila.

A permanent treatment facility was then delivered and commissioned in 2023 and it now has the ability to produce up to at least four million litres of high-quality water per day.

**“The process itself consists of containerised membrane filtration systems to remove all solids (including bacteria, algae and inorganic scale that can precipitate within the transfer and delivery pipelines),”** Mr Chalmers said.

**“This pre-treated water is then pressurised and presented to multi-stage**



**reverse osmosis systems that remove ~99.7% of dissolved salts to produce a high-quality desalinated water that is then partially remineralised so it can be transferred underground and to meet all human health and the long-wall OEM's requirements.**

**“The ancillary systems - such as chemical storage, dosing and cleaning systems, compressed air and transfer pumps are also substantially containerised minimising onsite works and associated costs.**

**“Balance of plant design – including required tanks and interconnecting pipework was modelled in 3D to allow full safety and constructability reviews.**

**“The mine site compliant control systems and electrical switchgear is enclosed in a customised modular switch room – delivered to site for placement and termination in-situ.**

**“The process equipment design is tailored to meet all site specifications and legislative requirements, and to handle the natural mine water variability expected over the life of the mine.”**

The successful implementation of this project will substantially reduce CapCoal's reliance on regional water supplies, making them more 'self-sufficient' – as well as reducing the water inventory held onsite.

Osmoflo operations and maintenance staff are now engaged on a site-based FIFO roster, along with 24/7 remote monitoring from their control centre, to safely and reliably deliver high quality water and to ensure the lowest overall cost of treatment and ownership results. **AMR**

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





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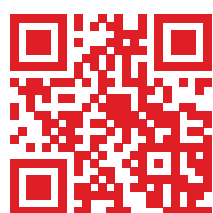
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# KATHLEEN VALLEY

## LITHIUM

# PROJECT

## ON TRACK FOR FIRST PRODUCTION



Kathleen Valley is on schedule for first production in the middle of this year.



On 22 January 2024, Lontown Resources Limited (ASX:LTR) confirmed that its Kathleen Valley lithium project remained on-track for first production in the middle of this calendar year and reiterated that the company remains focused on delivering to that schedule and on budget.

Lontown Resources is an emerging Tier-1 biter minerals producer, with the aim of being an ESG leader and a globally significant provider of battery minerals for the rapidly growing clean energy market.

As it transitions from explorer to producer, Lontown Resources is committed to incorporating the right approach and foundation from the outset and ESG principles underpin all decisions.

The recent material decline in spodumene prices has triggered significant reductions in short and medium-term lithium price forecasts.

As a result, the company has begun a review of the planned expansion and associated ramp-up of Kathleen Valley to preserve capital and reduce the near-term funding requirements of the Project.

The project review includes examining options to defer the timing of the previously announced 4mtpa underground development work, sequencing adjustments to the mine plan, and scope for additional cost optimisations.

There is no change to the 3mtpa plant capacity design which the company is currently constructing.

On 19 October 2023, Lontown announced that

it had signed a commitment letter and credit approved term sheet with a syndicate of lenders for a \$760m debt funding package, subject to the parties agreeing formal documentation and other customary conditions precedent.

The finalisation of the debt package has been impacted by recent reductions in the independent forecast pricing for spodumene upon which the lenders' credit approvals were based.

Accordingly, the company has now started discussions on a revised, smaller debt facility that will reflect the project review.

As a result, the commitment letter announced on 19 October 2023 will terminate.

Lontown has been advised by lenders within the syndicate that they remain highly supportive of the project.

It has approximately \$515m cash at bank at 31 December 2023, having now fully drawn the \$300m project funding package secured from Ford.

This is expected to fund construction activities required for first production in the middle of 2024.

The company expects to be able to provide a funding update by the end of the March 2024 quarter.

Lontown remains confident in the long-term outlook of the lithium market and Kathleen Valley's status as a Tier 1 long-life producer. **AMR**



Underground development commenced in November 2023 with the creation of six portals.



# BORETECH LEADS THE CHARGE IN MINING INSTALLATIONS



Since starting operations installing underground services for Telstra and NBN, Boretech Contracting has expanded its capabilities and now specialises in the installations of telecommunications, gas, water, electrical and sewerage infrastructure.

Based in Perth, Boretech is a leading contractor with highly qualified, well-trained supervisors, managers and employees to ensure the highest quality and consistency of products and service for your project.

Together with a diverse and professional team of experts, Boretech Contracting's fleet delivers unparalleled quality and innovation to provide clients with reliable and consistent projects delivered on time and on budget.

The extensive range of equipment includes Drill rigs, Service trucks, Vacuum trucks,

Excavators, Skid steers, trailers, Light vehicles and Specialised rock tooling – all well maintained and serviced to ensure optimal performance.

Boretech Contracting is proud to have been a part of some of the most impressive projects throughout WA, creating a strong presence across the state with its reputation for excellence and professionalism.

#### Liontown Resources Ltd

With construction well underway of the world-class Kathleen Valley Lithium Project in the Goldfields, Boretech Contracting was tasked with:

- The mobilisation and demobilisation of 2 x large Drill rigs
- Supply of all material for HDD
- Project management of SOW
- Welding and testing of all conduit

- HDD of 2 x 560mm sleeves under the Goldfields Highway in rock

All work areas for the project were kept to a minimum whilst minimising excessive disturbance was a big focus due to the area containing Aboriginal Heritage Land.

Boretech Contracting adhered to strict clearing boundaries with only foot traffic allowed along the bore path, whilst keeping Hard Rock Tooling/hammer equipment on standby due to concerns of granite being present.

Over 16 days onsite, Boretech Contracting successfully completed all works safely and efficiently within the time frame allocated to the Liontown project.

#### Karara Mine Site

This project required Boretech Contracting to complete 4 x 160pe power conduits

underneath a live conveyor belt supplying HV power supply to the new refinery. The team was able to mobilise on site at minimal notice, and worked together with Way Electrical to change the scope of work, as deep HV power eliminated the original plan to instal x 310mm steel sleeve.

Instead, a plan was made to use HDPE conduit, allowing flex to drill beneath HV and meet our minimum safe clearances.

The Liontown and Karara projects are just two examples of how Boretech's team has the expertise to deliver all project requirements, no matter the size, every time.

With more than 50 years' experience, Boretech Contracting are the experts you want on your team. **AMR**

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# IN-PRINCIPLE FINANCIAL SUPPORT FOR ARAFURA'S NOLANS PROJECT

About 135km north from Alice Springs in the Northern Territory, a globally significant and strategic project is being developed by Arafura Rare Earths Ltd (ASX: ARU).

The Nolans project encompasses a mine, process plant (comprising beneficiation, extraction and separation plants) and related infrastructure constructed and located at the Nolans site.

The project is underpinned by low-risk mineral resources that have the potential to supply a significant proportion of the world's NdPr demand – and will benefit from its Australian domicile and its proximity to transport, water and energy infrastructure.

Its cornerstone asset is the Nolans Bore rare earths-phosphate-uranium-thorium (REE-P-U-Th) deposit, one of the largest and most intensively explored deposits of its kind in the world.

The deposit contains a JORC 2012-compliant Mineral Resources of 56mt at an average grade of 2.6% total rare earth oxides (TREO) and 11% phosphate (P<sub>2</sub>O<sub>5</sub>) that extends to 215m below the surface.

Two-thirds of the contained rare earths are in high confidence measured and indicated resources.

The project mining operation will use conventional open-pit truck and excavator mining methods, supplemented by drill and blasting for ore and waste.

A JORC-compliant ore reserve supports an initial mine life of up to 38 years, with mining and processing of all known mineral resources extending the project's operational life to beyond 45 years.

Ore reserves are based on an average mining rate of 7.6mtpa to produce 1-1.3 mt of ROM ore each year and 316,000tpa of concentrate through the hydrometallurgical plant to produce a range of rare earth products and a phosphoric acid by-product.

The project is well developed, and in March 2023 entered its next phase with the start of site enabling works consisting of minor bulk earthworks and borefield headworks installation.

Arafura had also started securing long lead items and procurement of materials and equipment in support of its enabling works.

In December 2023, Arafura received a non-binding letter of intent (LOI) from the Export-Import Bank of Korea, Korea EXIMbank, for the provision of up to US\$150m in debt financing for the Nolans project.

The US\$150m will consist of two tranches – an amount equal to or more than US\$75m as a direct loan and an additional amount equal to or less than US\$75m as a debt guarantee.

The in-principle support from KEXIM is linked to the strategic nature of NdPr supply and its critical role in the electrification of Korea's automotive manufacturing sector. The LOI from KEXIM is linked to the binding

offtake arrangement in place between Arafura and Hyundai Motor Company and Kia Corporation for the supply of up to 1,500tpa of NdPr oxide (or NdPr metal equivalent), representing approximately 40% of the 85% annual production from Nolans available to be secured under long term sales arrangements under Arafura's offtake strategy.

KEXIM's support aligns with Arafura's debt-led funding strategy for Nolans and follows the Company's receipt of a LOI from Canadian export credit agency Export Development Canada (EDC) for up to US\$300m.

Commenting on the receipt of KEXIM's in-principle support for Nolans, Arafura Rare Earths managing director Gavin Lockyer says he is pleased to welcome KEXIM's LOI to provide debt financing support for the Nolans project.

"Arafura's foundation offtake agreement with Hyundai and Kia was the beginning of a meaningful relationship with Korea, and our engagement with KEXIM further strengthens that relationship," he said in December 2023.

"KEXIM's indication of support for Nolans directly reflects the significant contribution that NdPr from the project will play in delivering upon Korea's long-term aspirations to be a global leader in electric vehicles and other sustainability-focused technologies.

"We are delighted at the prospect of working closely with KEXIM as we continue our efforts to bring this globally significant project into full construction, and subsequently into production." **AMR**







# SGS: SUPPORTING CLIENTS ACROSS THE MINING VALUE CHAIN

**G**lobal organisation SGS, the world's leading testing, inspection, and certification company offers an integrated network of mineral related services, providing expertise and coordinated solutions for all your geological, analytical, metallurgical, plant engineering and environmental needs.

SGS is recognised as the global benchmark for sustainability, quality, and integrity, with Australia hosting one of the company's biggest geochemistry facilities.

"SGS Australia's Perth regional hub laboratory is a big commercial geochemistry facility in terms of throughput" SGS Australia Regional Geochemistry Business Development Manager Mark Davidson said.

"Rare earth analysis, requires a dedicated technical scope, and SGS have a significant capacity to undertake this analysis work in Perth."

SGS also has the ability to work with clients on site. "SGS has significant expertise in mine site support through laboratory management services that ensure analysis turnaround, quality assurance, and staffing is maintained for critical mine operation requirements" Mr Davidson said.

"Our services scope also supports analytical requirements at our hub commercial laboratories".

## Geochemistry Testwork

On sample receipt SGS prepares the samples, which consists of crushing and pulverising to 75 microns to get a certain grind size to make it applicable. Depending on the requirement, the samples may be subject to a digest process where it is taken into a solution mix.

The sample is then put through ICP-OES (Inductively coupled plasma - optical emission spectrometry) and ICP-MS (Inductively coupled plasma mass spectrometry) equipment.

The difference between these two pieces of equipment is lower detection limits on the mass spectrometer.

"SGS supplies specialised analysis solutions in rare earth analysis and is consulted by clients because of this experience" Mr Davidson said.

## Client Support

SGS supports its clients right from the get-go, with the company getting involved earlier across the exploration side.

"SGS provides dedicated services in the mining cycle, from quoting analysis costs for commercial exploration projects, to assessing the client scope for a dedicated mine site support facility. SGS will review the client scope and provide the best solution to meet project turnaround" Mr Davidson said.

"To support mine services SGS can be involved in quick turnaround assay requirements, such as grade control and resources definition analysis" Mr Davidson said.

"Mine support analysis can be undertaken at both site laboratories or commercial laboratories close to the projects at one of our commercial sites located in Perth, Townsville, or Kalgoorlie."

"Key clients for SGS use all our services, including site laboratory management and exploration chemistry analysis via our network of commercial laboratories. We also provide Minerals Trade Services to

assist with the international trade scope required for commodities."

The other value chain that SGS has is headed by SGS Business Manager for Metallurgy and Mineralogy Linus Sylwestrzak.

Mr Sylwestrzak gets involved if there are concerns with the processing aspects regarding metallurgical issues.

"From an SGS point of view, we have the ability, and we support clients on a project-by-project basis for their development through mineral resource and reserve estimation processes" Mr Sylwestrzak said.

"We also have the capability globally to be able to undertake metallurgical testwork that supports process flowsheet designs, and through our engineering business unit can prepare project feasibility studies."

## Arafura Work

Between 2015 and 2020, SGS supported Arafura Resources in the bench and pilot scale testwork for the flowsheet development of their Nolan's Bore project. Arafura plans to use a novel processing technology to recover rare earths.

"What we undertook is what you start with, bench scale testing. In the different stages of their flowsheet, you need to go

and investigate how the ore is going to perform" Mr Sylwestrzak said.

This means how much reagents are going to be consumed, what amount of energy and time is required to be able to recover and/or concentrate the rare earths into a stream that can then be further processed and refined.

This is initially completed on a small scale using up to a few kilograms of material per test. Following analysis and interpretation of the results from this testing, a number of consecutive stages are combined and evaluated using large masses of material on a continuous basis to obtain engineering and performance data.

"It [this work] provides the inputs for the Arafura Engineers to go and design with confidence that what they'll be building is going to perform the way it's intended to" Mr Sylwestrzak said.

"As it's novel and no one's ever done it before, you have to do a lot of investigative testwork to build understanding and confidence in your technology. You complete and interpret the results before considering what modifications you might try and investigate further, so you have an understanding over a wide range of conditions how each particular unit operation is going to perform."

Currently, Arafura have commenced early-stage engineering and some preliminary site works prior to their Final Investment Decision (FID) being made to justify the build of the mine.

As SGS is known for its ability to work onsite, we were requested to tender by Arafura for the onsite support laboratory and are now waiting for the outcome.

"We tendered on that and we're currently in waiting mode where our tender has been submitted, they've already assessed it and when they get to that stage of the project development process they'll come back and tell us whether we're successful or not" Mr Davidson said. **AMR**





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# MANUFUTURING WITH PRECISION

IT'S HAPPENING! AMW2024 IS ON AT SYDNEY'S ICC DARLING HARBOUR 17-19 APRIL, 2024!

Australia's premier manufacturing technology trade show, AMW2024 in Sydney, is promising to be a dynamic and innovative event that brings together professionals, companies and experts from many industries related to manufacturing, engineering and technology. It is AMTIL's aim for Australian Manufacturing Week to be more than just an exhibition. This is the centrepiece of a week-long celebration of manufacturing in Australia today.

"On the back of the overwhelming success of AMW2022 in Sydney, we have returned to the ICC at Darling Harbour for April 2024 and are excited to be delivering another strong show," said Shane Infanti CEO of AMTIL, organisers of Australian Manufacturing Week. "We are very pleased to have the support of the NSW Government as the Major Sponsor for AMW. Government support is important in delivering the message to our industry that manufacturing is important and that the support mechanisms are there to assist."

Australian Manufacturing Week will take place at the International Convention Centre, Darling Harbour, Sydney.

The stats from our Melbourne show at the MCEC showed conclusively the appetite for large-scale manufacturing exhibitions is healthy for all levels of the economy. The numbers from the Melbourne AMW2023 show are something we are particularly proud of, with 15,914 attendees coming to see 348 exhibitors in the biggest exhibition space in Australia. And AMW2024 Sydney would strive to deliver the same if not better. As we saw in 2022, the ICC Darling Harbour in Sydney is also up to the task.

"We will again be running the Future Solutions Speaker Program on the floor of the show. Themed towards Opportunities and Managing Change, the Speaker Program is once again free to visitors to attend,"

added Kim Banks, AMTIL's Head of Events. "Our plans for AMW include expansion of our Welding & Air Technology Zone and Robotics & Automation Zone. This will round out the event in representing the manufacturing technology sectors in Australia."

There will be Seven distinct Zones at AMW2024, each showcasing the highlights of the different active sectors in Australian manufacturing industry.

The **AUSTECH Machine Tool Zone**, specifically targeted at the metalworking, machine tool and ancillary market. AUSTECH covers advanced manufacturing products and processes including CNC Machinery, Lathes, Mills; Contract Manufacturing/Precision Machining; Cutting Tools, Tooling and Tool Holding; Forming and Fabricating Machines; Plasma, Laser, Waterjet and Ultrasonic Machines; Ancillary equipment suppliers.

The **Additive Manufacturing Zone** will showcase the most advanced technologies within this sector. The various techniques within Additive Manufacturing include Stereolithography, Selective Laser Sintering, Material Extrusion, Sheet lamination, Binder jetting, Cold Spray processing, Material jetting, directed-energy-deposition, powder-bed fusion, VAT photo-polymerisation and wire arc manufacturing (WAAM).

The **Australian Manufacturers Pavilion** showcases the capabilities of Australia's precision engineering and advanced manufacturing industry. The Australian Manufacturers Pavilion is where AMW celebrates the very best in Australian manufacturing, providing a showcase for some of this country's most accomplished component manufacturers, precision engineering firms, toolmakers, advanced manufacturers, and general engineering companies.

The **Manufacturing Solutions Zone** at AMW2024 offers optimised solutions to the most common challenges experienced by manufacturers. From materials handling and warehousing to integrated manufacturing and safety solutions. The Manufacturing Solutions Zone is where you can find answers, incorporating everything from equipment for materials handling and logistics, and safety products, through to the latest software for streamlining manufacturing operations, and specialist service providers in areas such as law, finance, skills, training, and recruitment.

The **Robotics and Automation Zone** at AMW2024 will feature the latest state-of-the-art equipment and processes for the optimisation of manufacturing operations. Robots are practical technologies, with artificially intelligent software brains, created and designed by engineers to refine, manufacture, and move Australian manufacturing ahead. The robot realities of today are liberating human workers from an ever-growing array of repetitive

and dangerous tasks. There will be Industrial robotics, Robots, Automated Solutions, Instrumentation Control Systems, Measurement, Pneumatics, IOT Solutions, Industry 4.0 and Digitalisation.

The **Weld & Air Solutions Zone** will highlight advanced welding processes and provide high-quality interactive experiences that demonstrate developments and applications in the welding sector. Welding is critical in metal fabrication and manufacturing today. In fact, it is used in creating more than half of all the products manufactured in Australia.

The **Plastics Technology Zone** is your hands-on opportunity to see and feel the latest in plastics machinery, mould-making technologies, recycling materials, and the many plastics manufacturing processes. Plastic technology is a specialised branch of study which includes the study of diverse types of chemicals that exhibits plasticity. It also involves the study of several methods in which plastics can be utilised for use in human life. **AMR**





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# Why are you risking it? When it 'just makes good sense' to design, source and fabricate in Australia for Australian business.

**F**or miners selecting a steel fabricator, price driven procurement would have it that custom plant and equipment can be sourced offshore with the belief that the same deliverable will be achieved for less.

But Perth-based mining fabricator and innovator, Western Metalworx has some hard truths to share with companies going offshore for their fabrication needs.

"The proof is in the pudding," says Anthony Chiera, Managing Director reflecting on his company's rise to trusted partner of blue chip and global mining contractors.

"The supply and manufacture of custom components and equipment from within Australia to Australian mining projects not only makes good business sense but can also save your reputation.

And that is even before we had these relatively new and emerging risks like disrupted supply chains, war, rising energy and shipping costs, and shortage of components."

Quality of the final product is of course often mistakenly thought to be comparable from offshore sources, however in many

instances it's not just the manufacturing process that could leave you open to risk, but the quality of the steel itself.

"A quality product begins with quality material, and we've spent more than a decade securing a strategic supply network, to ensure our procurement of steel is high end, from a diverse and trusted supply base and built for the harsh conditions and standards in the Australian mining industry," explains Chiera.

Today Western Metalworx holds long-term relationships with pre-qualified steel merchants in locations including Korea, Japan, Sweden and China, proven to deliver steel compositions that can deal with mining industry applications, stress fatigue and harsh environmental factors like the Pilbara sun.

It's not uncommon for Anthony and his team to fix up a job procured offshore, from shoddy welding that does not meet Australian standards, to cheap Indian steel with a high recycled content, such poor workmanship can lead to serious injury or catastrophic failure.

"Some of the offshore flaws we've been asked to fix recently include a hydrau-

lic boom arm showing stress fractures just 8 weeks after commissioning, something you wouldn't expect to see for ten years or more. When making decisions on the repair, we were unable to obtain the material data report because it didn't exist.

Another catastrophic example - hydraulic pipes that were failing under pressure and a manufacturer's data report (MDR) supplied in another language with no reference to an ISO or Australian Standards.

Machinery down time costs money, but when you consider the immediate impact to life and limb of those working for you, procurement needs to put the safety of the operator before anything else," says Chiera.

With a rising focus on environmental, social and governance (ESG) issues, Western Metalworx has seen a positive rise in customer's seeking Australian workmanship and with greater rigour around supply chain due diligence and concern for security of supply.

It comes down to being willing to associate yourself with the final output. While not every job requires an MDR, Western Met-

alworx have invested heavily in documentation and transparency, from reporting on welding qualifications, procedures, QA/QC inspection, surface treatment and steel source and composition - reports should reflect how reputable a job is.

In addition, appropriate supplier due diligence should extend to ethical labour and working conditions, another factor to consider once sourcing moves away from home.

"I'd urge procurement professionals to remember the age old saying 'you get what you pay for' and if you're going to buy overseas, at least explore the option of having it made here in Australia - I'd bet you'll be relieved with the outcome.

In most cases you'd be looking at a 20-30% price differential, but that percentage becomes irrelevant when you come out with a flawless product and your reputation still intact," concludes Chiera.

With 35 staff, an expanding purpose-built Malaga workshop and a reputation for uncompromising quality, Western Metalworx is one of the state's leading providers of steel and aluminium fabrication for the mining and industrial sectors. **AMR**





# Custom Fabrication and Repairs for the Mining Industry

At Western Metalworx, we've built our business and reputation from the ground up. We understand the industry and its associated challenges, making us Perth's go-to mining fabricators.

## OUR APPROACH TO OVERCOME MINING CHALLENGES

### ► Innovate

We consider custom solutions to fix unique problems – there is no 'one size fits all' in the fabrication industry

### ► Create

We develop a solution that efficiently gets a machine up and running – and is built to last

### ► Ideate

We work with our clients to build on their deliverables in a collaborative process

Ready to engineer your vision? Get in touch with a fabrication expert for all your custom mining requirements.



# AWARD-WINNING MODULAR BUILDERS

**N**orthern Transportables specialises in the design, manufacture, delivery and installation of turnkey transportable modular building solutions.

Locally established, owned and operated in the Northern Territory, Northern Transportables is an award-winning transportable building manufacturer, servicing mining, oil and gas industries as well as for the construction, education and government sectors.

From its head office, fabrication and manufacturing facility base at East Arm and its Hire Asset Facility at Pinelands, the company's modular building solutions are all completely customisable to suit the unique needs of its clients.

Northern Transportables supplies portable sheds for mining camps, control rooms, site huts, kitchen and crib facilities, laundries, and office spaces.

From single and multi-level modules to complete mining camps, Northern Transportables' professional team works closely with clients to develop building solutions that meet their needs, ensuring that clients get the right transportable the first time.

Northern Transportables' fabrication and manufacturing facility is fully equipped, with more than 3000m<sup>2</sup> under roof, allowing all construction to be completed on site and in a short time frame.

The highly skilled and experienced team are committed to providing the best service possible to all clients.

Its Northern Transportables team consists of skilled tradesmen, apprentices and trainees, transport and logistics staff, a professional design team including qualified structural drafters and building information modellers (BIM), and qualified professionals in areas such as accounting and finance, contract and project management, human resources, work health and safety, governance and risk management.

Northern Transportables offers a creative and innovative design experience through interactive 3D modelling, involving the customer in the design process every step of the way to capture their vision and will then tailor plans to the client's exact requirements.

All designs are rated for cyclonic conditions, employ all-steel construction and are designed and certified in accordance with Northern Transportables standard drawings.

The next step is installation of the building to onsite services, connections and supply of goods including office desks,

chairs, whiteboards, gas ovens, beds and fridges to accommodation buildings, all completed by the Northern Transportables team.

The company works closely with Project Building Certifiers who certify the building and provide a permit to occupy.

Prefabricated and manufactured on-site from the ground up, its products are delivered Australia-wide using its own fleet of NHVAS and WAHVA prime movers and trailers.

The company has a sound reputation for successfully delivering quality transportable building solutions with its quality products and services used by major resource companies across WA and the Northern Territory, including Ichthys LNG, Rio Tinto, BHP Billiton, Fortescue Metals Group (FMG) and Xstra Zinc.

Recent projects include the construction and maintenance of a 1000-man camp at FMG Eliwana Rail Camp 95, mining, offices and site facilities for South 32's Groote Eylandt Mining Company (GEMCO) and accommodation for Jemena and McConnell Dowell on the Northern Gas Pipeline.

As a registered building contractor at the forefront of the Northern Territory's transportable manufacturing industry, Northern Transportables designs and manufac-

tures transportable modular buildings for both sale and hire, Australia-wide.

In addition, it offers raw construction materials for sale and road train fleet services for wet or dry hire.

Northern Transportables is accredited under both the National Heavy Vehicle Accreditation Scheme (NHVAS) and the Western Australian Heavy Vehicle Accreditation (WAHVA) Scheme, which allows it to repair and maintain its accredited heavy vehicles and trailers in-house, ensuring compliance with safety standards.

As a leading transportable manufacturing industry, the company supports the Northern Territory economy and industries, 'Buying Local' policy to support local businesses, local suppliers and employing local labour where possible.

Operating under a triple Certex Quality, Safety and Environment Integrated Management System and Contractor Accreditation Limited (CAL) accreditation, Northern Transportables' success is supported by a values-based working environment with a strong focus on quality, safety and reliability. **AMR**

For further information, Northern Transportables can be contacted on **(08) 8995 6500** or visit its website at **[www.northerntransportables.com.au](http://www.northerntransportables.com.au)**

Prefabricated and manufactured entirely on-site, Northern Transportables products are delivered Australia-wide with its own freight fleet.



Prefabricated and manufactured entirely on-site, Northern Transportables products are delivered Australia-wide with its own freight fleet.



Mine site accommodation and offices, delivered and installed are a specialty.





☎ (08) 8995 6500

🌐 [www.northerntransportables.com.au](http://www.northerntransportables.com.au)

✉ [enquiries@northerntransportables.com](mailto:enquiries@northerntransportables.com)



## GET THE RIGHT TRANSPORTABLE THE FIRST TIME



Northern Transportables specialise in the design, manufacture, delivery and installation of turn-key transportable modular building solutions.

Transportable buildings are a fast & cost-effective solution available for both sales and hire, our buildings are completely customisable, cyclone rated and built to code.

We operate under a certified Integrated Management System, ensuring you **GET THE RIGHT TRANSPORTABLE THE FIRST TIME.**

Whether your business is in mining and civil, oil & gas, government or private enterprise, our professional team will make it happen.

### Our team of professionals provide:

- Commercial accommodation, bunkhouses and site huts
- Mining camps
- Education and recreation facilities
- Offices, control rooms and site facilities
- Commercial kitchen facilities, lunch rooms and cribs
- Toilets, ablutions and laundries
- Health care and first aid facilities
- Domestic housing and granny flats
- Emergency housing solutions



# UNLOCK EFFICIENCY, EMBRACE FLOW: MASTER MINE DEWATERING WITH LAYFLAT HOSE

Layflat hose is making a greater appearance in the mining sector for its efficiency and performance. Often used for rapid in-pit dewatering, more engineers are embracing the concept of using layflat hose up high pit walls instead of HDPE.

Crusader Hose explains the origins and benefits of its layflat hose systems.

## Canvas fire hose

Mine dewatering hose has evolved from woven, layflat, fire hose. Fire brigades all over the world use woven "canvas" fire hose for its many favourable characteristics.

Compact and lightweight, it is easy to handle. Multiple lengths can be stored on the firetruck and deployed quickly and easily once at the scene of the emergency. Woven layflat hose can also handle high pressures, which is essential as buildings have become higher.

In Australia, the standards for Class H fire hose dictate a burst pressure of over 5,250 kPa or 525m.

## Mine dewatering hose

The characteristics of fire hose are replicated in mine dewatering hose in addition to other features, making layflat hose a highly desirable mining product. Larger diameter hose has been developed, still with the textile "canvas" reinforcement. These interlocking fibres result in burst pressures for mine hose, typically 5x that of poly pipe.

To complete the fabrication process, this

textile reinforcement is fully encapsulated with extruded thermoplastic polyurethane, giving the finished hose a liner and an abrasion-resistant cover.

Crusader Hose managing director Francois Steverlynck states, "We have pioneered incredible achievements in Australian manufacturing with our layflat hose systems. Our hose is amongst the highest pressures of any other supplier in the world!"

The 152mm Crusader Hose Waterlord® mine dewatering hose has a burst pressure of 9,000 kPa (900m head), which ensures a high safety factor when connecting to a helical rotor or centrifugal pump. This Crusader hose is only 4mm thick.

"Our mine dewatering hose is compactly wound onto reels or onto pallets, enabling quick deployment," continued Francois. "Similar to the needs of the firefighter regarding efficient and easy-to-handle equipment, the high-pressure capability and flexible characteristic makes layflat hose an ideal solution for pumping water up or down high pit walls." The Crusader Layflat Hose System can pump up 400m from within a deep pit.

## High Wall Pumping

The Crusader Layflat Hose System is particularly suited to pump water out of deep pits or under high pressures. This innovative system is supplied on reels, and the hose unwinds from the top of the pit wall. The reel is placed at the top of the pit, and a rope is tethered to one end. Drones are normally used to get the tether rope connected down into the pit. Once the rope is attached to a vehicle, the pipeline can be deployed by gently driving along and dragging it into position. There is no need to anchor the layflat hose at each bench.

## Surface contact

The flexible nature of layflat allows the pipeline to adapt to and follow the contours of the pit wall. At points of contact between the hose and the pit wall, the layflat hose 'grips' the wall and does not slide down unless pulled.

This unique frictional contact makes the installation of a layflat pipeline down a high pit wall a safer and less risky process compared to HDPE poly pipe or steel.

With HDPE, engineers need to calculate overall weight, the distance between

bench heights, potential creep, and complex anchoring requirements in addition to maintaining safety standards for the installers and welders. This is more time-consuming and expensive compared to the planning and installing layflat hose.

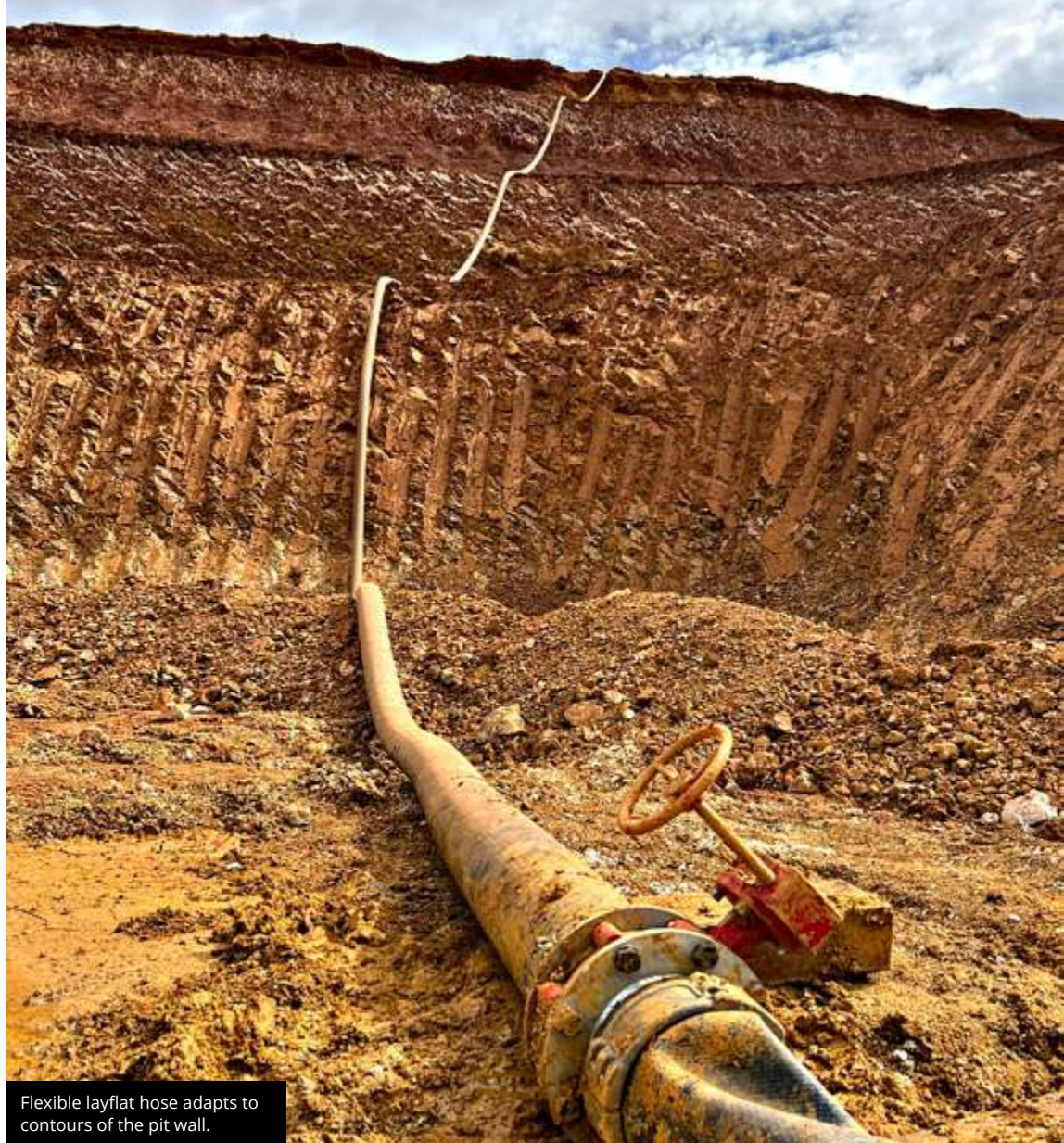
## No temperature derating

Another intrinsic benefit of mine dewatering layflat hose is that it is not derated due to temperature. When comparing woven layflat hose with HDPE pipes, the manufacturing process with the inner textile reinforcement is the critical difference. HDPE pipes are homogenous thermoplastic structures that soften with increasing temperatures.

"With the high-temperature conditions experienced in many mines across Australia, our layflat hose will not burst or pull apart even at 80 degrees Celsius," explained Francois.

## Technical support

Crusader Hose have the technical support and offer training to assist mines in mastering mine dewatering using layflat hose. Their technical expert can spend one or two days on site anywhere in Australia to ensure a safe and rapid installation. **AMR**



Flexible layflat hose adapts to contours of the pit wall.



Three layflat pipelines up the high pit wall.

FEB2024 AMR



Up to 200m of layflat hose compactly wound onto a reel and prepped for deployment.





**schenck**process 

# Stronger together



Schenck Process Mining has become part of Sandvik Rock Processing Solutions.

SP Mining & Sandvik share a deep passion for innovation. Our combined global footprint of R&D and

production facilities bring the expertise of our people even closer to our customers.

**We are now better positioned than ever, to develop innovative solutions to the challenges of our industry.**



Watch this video to learn what this new partnership means to your business or visit our website:

**ROCKPROCESSING.SANDVIK**



we make processes work



# WA'S FABRICATION SPECIALISTS



**S**pecialist steel fabrication company Arch Engineering has been operating since 1970.

With the capacity to complete a wide variety of fabricated steel projects for the mining, process, oil and gas industries, it can manage, implement, and integrate all aspects of complex industry projects from drafting, fabrication through to surface treatment and delivery.

The business, located in Bibra Lake, WA, has a 3000m<sup>2</sup> facility and employs a skilled workforce with commitment and experience to match all project requirements.

Arch's fabrication team is experienced and possesses strong capabilities to execute wide ranging fabrication projects for mining, oil and gas.

The team is committed to high quality standards and efficiency to ensure client expectations can be met, and boasts quality management system certification to ISO 9001:2008.

Arch Engineering's fabrication workshops are equipped for all type of fabrication and modularisation services.

They incorporate three fully equipped workshops utilising four overhead cranes with up to 20t capacity capable of handling all types of fabrication.

Its mining and mineral processing services include:

- A wide range of structural packages
- Screening equipment
- Crushing equipment
- Conveyors
- Shuttles
- Chutes
- Mining consumables and tools
- Plate work fabrication
- Pipe supports and clamps
- Railway equipment
- Handrails, stairs, walkways
- Trusses
- Silo conveyors
- Monorail structures
- General steel fabrication

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**AE ARCH ENGINEERING**



9 Rivers St, Bibra Lake WA 6163

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

**All workshops are fully equipped for all types of fabrication services.**

Facilities incorporate three fully equipped workshops utilising 4 overhead cranes with up to 20 tonne capacity capable of handling all types of fabrication such as:

## STEEL FABRICATION

- PLATEWORK
- STORAGE TANKS
- CONVEYORS
- OFFSHORE STRUCTURES
- SUBSEA STRUCTURES

# WA'S STEEL FABRICATION SPECIALISTS





# ROAD CONSTRUCTION SPECIALISTS

**D**esert Sands Cartage was founded over 30 years ago by Rex Ryles in Laverton, WA, which is known as the gateway of the Great Central Highway. As a family-owned business, we are 100% focused on providing old-fashioned, reliable customer service with a flexibility that meets customers' needs.

We specialise in supplying remote outback and mining projects in regional WA and the Northern Territory with potable water, sand, fuel and various other bulk haulage requirements.

We pride ourselves on being on time, on budget, whilst maintaining the highest possible safety standards in our field. Our comprehensive knowledge of the diverse requirements needed in remote Australia are second to none — so rest assured your project is always in the hands of skilled and respected professionals.

#### Our Services

Over our 30 years of operation, we have worked across transport, civil contracting, potable water supply, concrete and bulk fuel haulage. Additionally, we have extensive experience in hauling ores and associated construction materials such as sand, gravel, aggregates, fuel and potable water

into some of Australia's most remote and isolated areas.

Desert Sands has carried out annually extensive civil works for government organisations with one of the major construction projects being the Great Central Highway in WA.

#### Our Fleet

Desert Sands has an extensive fleet list to provide for the many varied requirements of its clients. All company owned equipment is strictly maintained in accordance with the National Heavy Vehicle Accreditation Scheme.

We have been involved in the build and construction of around 1000km of roads, including the Yalgoo to Mt Magnet Road, Fitzroy Crossing to Halls Creek sections, Roper Highway, Port Hedland to Newman, TX and RX access roads, and 450km of the Great Central Highway.

We have also worked on multiple access roads in the Central Desert Lands and South Australian Pitlands. **AMR**

For more information, visit  
[www.desertsandscartage.com.au](http://www.desertsandscartage.com.au)  
or call +61 8 9031 1326



**DESERT SANDS**  
CARTAGE CONTRACTORS  
Est. 1989



**INVOLVED IN THE  
CONSTRUCTION AND  
BUILD OF MORE THAN  
1000KM OF ROADS**

A family-owned business, Desert Sands Cartage specialises in supplying remote projects across regional WA and the Northern Territory.

We have experience in hauling gold, nickel, concrete, sand, gravel, fuel and potable water to some of the country's most remote and isolated areas.

We have been involved in multiple road construction projects including:

- >> Yalgoo to Mt Magnet Road
- >> Fitzroy Crossing to Halls Creek
- >> Roper Highway
- >> Port Hedland to Newman
- >> TX and RX access roads
- >> 450km of the Great Central Highway

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# FLUE GAS ANALYSER:

## GOOD FOR THE COMPANY, GOOD FOR THE ENVIRONMENT

**A**ccurately measuring emissions with low concentrations is critical to the efficiency and longevity of systems.

With its ability to accurately measure emissions, the testo 340 gas analyser makes sure companies keep their systems within the optimum operational parameters. Variation in flue gas can often lead to an engine losing its effectiveness and ultimately reducing productivity and general output.

The analyser houses up to four gas sensors, an oxygen sensor comes as standard but carbon monoxide, nitrogen oxide, nitrogen dioxide and sulphur dioxide sensors can also easily be added. Data readings to find the cause of potential issues are shown in either graph or table form and can even be made available remotely via Bluetooth on a Smartphone or downloaded for further analysis to the easy-Emission software via USB connection.

Adding to the versatility is the number of probes available which can be used in tandem with testo 340. Different flue gas probe lengths, diameters and tempera-

ture tolerance, plus a mini peltier cooler option add up to create a flexible solution for use across many industries.

The testo 340 flue gas analyser is the benchmark instrument for tuning and maintenance for gas and diesel engines. The instrument measures emissions values which provides the basis for diagnosis for what needs to be adjusted.

What technicians and engineers love about this instrument is its accuracy, ease of use and the fact that it can be used even in rugged environments.

Accurate flue gas analysis is essential to ensuring that the output from any combustion system is consistent. The versatility, robustness and scalability of testo 340 is ideal for industry professionals looking to carry out measurement, monitoring and maintenance works. See them in use out in the field or enquire for a local demonstration. **AMR**

**For more information, visit [testo.com.au](http://testo.com.au), email [info@testo.com.au](mailto:info@testo.com.au) or phone (03) 5198 7472.**

Be sure. **testo**

**Your emission testing partner in the mining industry.**

testo 340 diesel emission analyser with local service & calibration

Discover more



testo.com.au  
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# ONE GLOBAL LOGISTICS: DELIVERING ENERGY

One Global Logistics is a market leader in global shipping, customs clearance and landside logistics provider within the mining, solar and renewable sectors.

One Global Logistics Solar and Renewable Logistics Solutions involve the systematic shipping and supply chain planning, delivery implementation, and day to day management of the shipping, customs clearances, local transportation and storage of equipment, materials, and products related to solar and renewable energy systems being delivered to mining sites throughout Australia.

Our services include the overseas shipping and delivery of solar panels, tracker array systems, wind turbines and blades, BESS, Inverters and related equipment along with other components required to construct and operate renewable energy systems in remote locations.

Innovative and reliable logistics solutions for solar and renewable energy systems require a deep understanding of the unique requirements and challenges associated with these technologies and locations.

Renewable energy systems are often located in remote areas and require specialised

equipment and transportation methods. Additionally, the logistics of renewable energy systems must be carefully managed to ensure that products and components are delivered on time and in good condition and on time as per the construction schedule.

Effective solar and renewable logistics solutions involve a range of strategies, including supply chain optimisation, route planning, and inventory management.

Logistics providers must also have a strong understanding of the regulatory requirements associated with the transportation of renewable energy systems, including the necessary road permits, DA and TMR.

Throughout Australia, there has been a growing demand for sustainable logistics solutions, which prioritise the use of low-emission vehicles and renewable energy sources to power transportation and storage facilities. These solutions are becoming increasingly important as the renewable energy sector continues to grow and evolve.

For business enquiries contact  
Director James Sparke on 0458 755 171  
or [james@onegloballogistics.com](mailto:james@onegloballogistics.com).

AMR

## ONE GLOBAL LOGISTICS RENEWABLE LOGISTICS SOLUTIONS

Australia's Leading Shipping & Forwarding Agent managing Renewable Logistics delivery throughout Australia.

 **Solar Farm Project Delivery**  
TRACKER ARRAY, MODULES, INVERTERS, BESS & SKADA

 **Wind Farm Project Delivery**  
TURBINES, TOWERS & BLADES

 **Battery Energy Storage Systems**

 **Inverter Stations & Switch Rooms**



**James Sparke**  
0458 755 171



**Chris Attard**  
0408 908 996



**Jake Bowcock**  
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FROM SUPPLY TO SITE • AUSTRALIA WIDE • END TO END SUPPLY CHAIN SOLUTIONS



# WORLD’S FIRST EXCLUSION ZONE FOR MOBILE PLANT. BECAUSE EVERYONE DESERVES TO GET HOME SAFELY.

In a world where safety is paramount, Incident Zero has pioneered a groundbreaking innovation, setting a new precedent for workplace safety. The ethos is simple: a safe return home for every worker, every single day. And with the advent of the Safety Halo™, that vision takes an unprecedented leap forward.

At the heart of this evolution lies an unexpected collaboration—a synergy between an Australian truck driver and a luminary laser engineer from the United States. What began as a chance encounter after a speculative email blossomed into an extraordinary partnership, driven by a shared passion for safety innovation.

The Safety Halo, a testament to this partnership, employs a revolutionary concept: harnessing low-powered red laser light to delineate a distinct exclusion zone around mobile machinery. Developed over a rigorous seven-year research and development phase, this system redefines safety standards within mining environments.

Behind its brilliance lies a profound understanding of human-eye biophysics, intricate laser engineering, and an

unwavering commitment to meeting global safety standards. The result? A laser system that defies convention—resilient, bright, long-reaching, and impervious to the harshest rigours of mining sites while maintaining an impeccable safety classification.

What sets the Safety Halo apart isn’t just its technological finesse; it’s the intuitive design that speaks a universal language to all.

The stark red zone signals danger in a way that transcends language barriers or educational levels. It triggers an innate response, compelling individuals to instinctively steer clear of potential hazards, making it arguably the most effective mobile plant exclusion zone system available today.

Unlike conventional systems reliant on driver input, the Safety Halo stands as an autonomous guardian, a beacon of safety ensuring that the riskiest human-machine interactions become a thing of the past.

For more information about the Safety Halo™ by Incident Zero, please visit [www.incident-zero.com](http://www.incident-zero.com) or phone 1300 845 451.

LASER SAFETY HALO™



# WORLD’S FIRST EXCLUSION ZONE FOR LARGE-SCALE MOBILE PLANT.

**Because everyone deserves to go home safely.**

Safety Halo™ by Incident Zero is the world’s first exclusion zone for large-scale mobile plant that leverages neuroscience to positively affect human behaviour and induce safety. Projecting large distances, and built to withstand the rigours of large-scale machinery, the Safety Halo is the most effective exclusion zone system for mobile plant in the mining industry.

**Contact Us**  
Phone 1300 845 451 | Website [www.incident-zero.com](http://www.incident-zero.com)



LASER SAFETY HALO™



# PLASMA WEAR PARTS:

## Unrivalled Expertise, Unmatched Solutions



In the dynamic landscape of mining operations, where the efficacy of ground engaging tools is paramount, Plasma Wear Parts stands tall as a beacon of innovation and reliability. With a decade of dedicated service to the leading mining companies in Australia, our commitment to excellence has evolved, culminating in a comprehensive solution for ground engaging tools that sets us apart in the industry.

At the heart of our success is a profound understanding of the challenges faced by the mining sector. For the past ten years, Plasma Wear Parts has been at the forefront, championing the benefits of hardfacing.

Our journey has been marked by collaboration with industry leaders, and through these partnerships, we have honed our ex-

pertise to deliver unparalleled solutions. Our latest venture focuses on providing the very best aftermarket parts for dozers and graders, offering mining operations a reliable alternative to OEM suppliers. The question naturally arises – why should you trust Plasma Wear Parts over more established OEM suppliers?

**Expertise Forged Through Experience**  
Plasma Wear Parts has earned its stripes through a decade of hands-on experience, working shoulder-to-shoulder with Australia's leading mining companies.

Our journey in promoting the advantages of hardfacing has equipped us with an in-depth understanding of the wear and tear challenges faced by ground engaging tools. This knowledge forms the bedrock of our commitment to delivering top-notch solutions.

**Tailored Solutions for Dozers and Graders**  
We recognise the unique demands placed on dozers and graders in mining operations. Our aftermarket parts are meticulously engineered to not only meet but exceed industry standards. From durability to performance, Plasma Wear Parts ensures that each component is a testament to our dedication to quality.

**Agility and Innovation**  
While established OEM suppliers may be bound by traditional processes, Plasma Wear Parts thrives on agility and innovation. Our commitment to staying at the forefront of technological advancements allows us to swiftly adapt to evolving industry needs. This agility translates into faster response times, customised solutions, and a proactive approach to addressing the challenges faced by our clients.

**Client-Centric Approach**  
Trust is not simply given; it is earned through consistent delivery and a client-centric ethos. Plasma Wear Parts places the client at the core of its operations. We pride ourselves on building enduring relationships by listening to our clients, understanding their unique requirements, and tailoring solutions that not only meet but exceed expectations.

Plasma Wear Parts is not just a supplier; we are a strategic partner in the success of your mining operations. Our journey from hardfacing advocacy to providing a total solution for ground engaging tools is a testament to our evolution and commitment to excellence. When you choose Plasma Wear Parts, you choose a partner dedicated to pushing the boundaries of what is possible in mining equipment reliability and performance. **AMR**



## DELIVERING UNPARALLELED SOLUTIONS ACROSS MINE SITES.

**Our access to a wide range of international suppliers allows a greater scope for innovative wear solutions.**

Research and development are at the forefront of everything we do with the aim to develop our plasma-branded powders unique to customers and able to deliver outstanding results tailored to the unique wear environment.

**Hardfacing benefits:**

- ✓ High automation
- ✓ Small heat affected zone
- ✓ High powder utilisation
- ✓ Low dilution rate
- ✓ Wide range of hardfacing materials



0450 372 229  
sales@plasmawearparts.com.au  
www.plasmawearparts.com.au







# THE WORLDWIDE LEADER IN VIBRATION TECHNOLOGY

## INDUSTRIAL VIBRATORS Designed for industrial sectors

OLI is the world's top selling manufacturer of electric and pneumatic vibrators. The high level of customer service, guaranteed by 18 trading subsidiaries worldwide, and long-lasting and performing products make us always ahead.

Our vibrators are designed for industrial applications in all sectors, from the most extreme environments such as quarries, mines and foundries to the food and pharmaceutical.



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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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THE AUSTRALIAN  
MINING REVIEW





# MORE INTEGRATION. LESS HEADACHES. THAT'S IMPACT!

**M**ining, 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. It has transformed into what is now one of Australia's largest drill and blast businesses with bulk explosives manufacturing and 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 shot firing.

According to Impact Product 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,

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 placement 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 utilises 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 a major electronic detonator manufacturer, our clients have realised significant benefits," Mr Woodgate said.

"Our programmable detonators allow timing from zero to 20000 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  
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Impact Drill & Blast offer a fully integrated service eliminating the need for you to deal with multiple service providers. Our commitment to delivering 'more bang' for 'less bucks' sets us apart from the competition and ensures you get the best possible outcome for your investment.

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# BET ON BARTLETT AT EVERY DEPTH



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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- Mud Rotary
- Geotechnical - SPT Drilling
- Exploratory Earth Probes
- Auger - Soil Sampling



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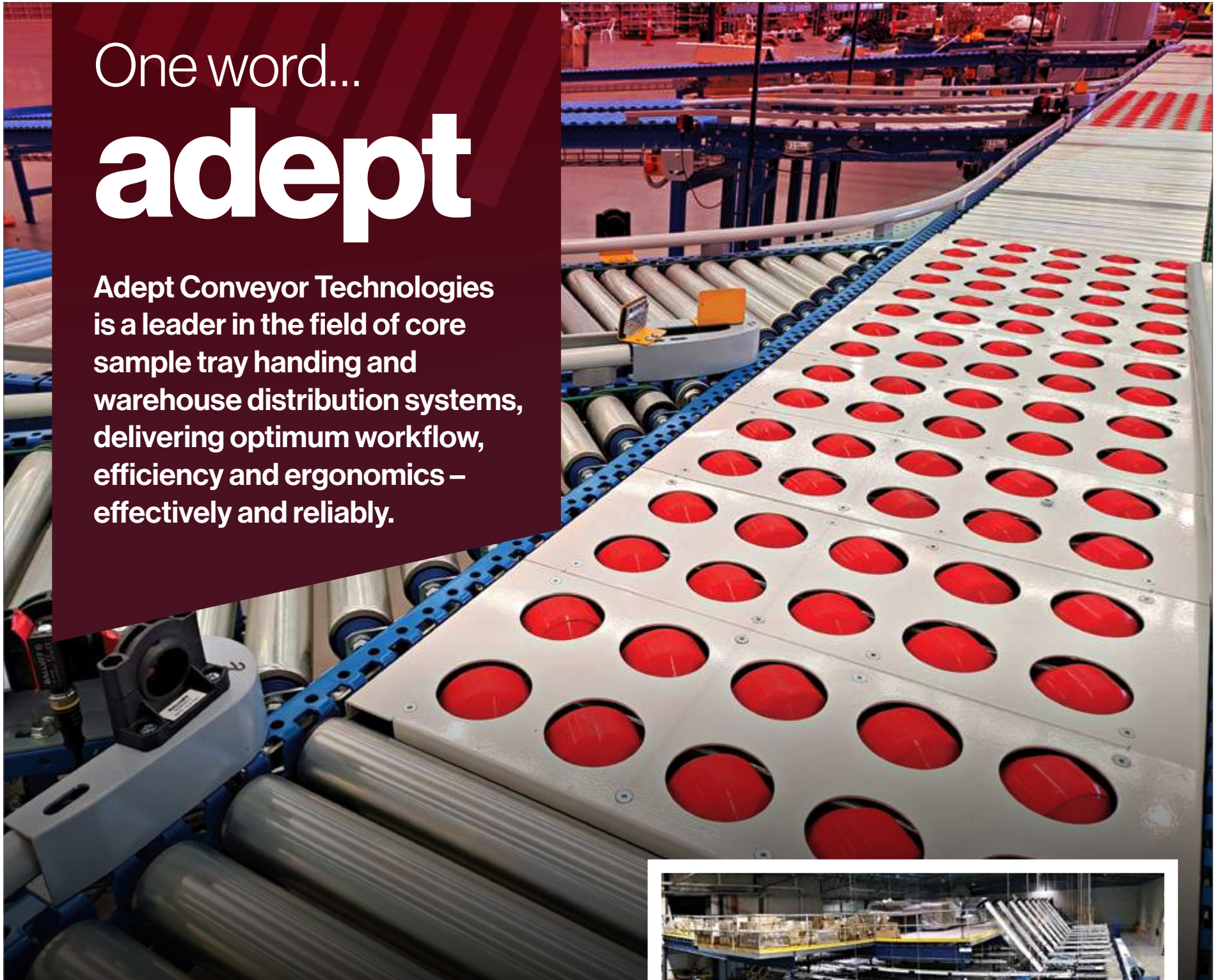
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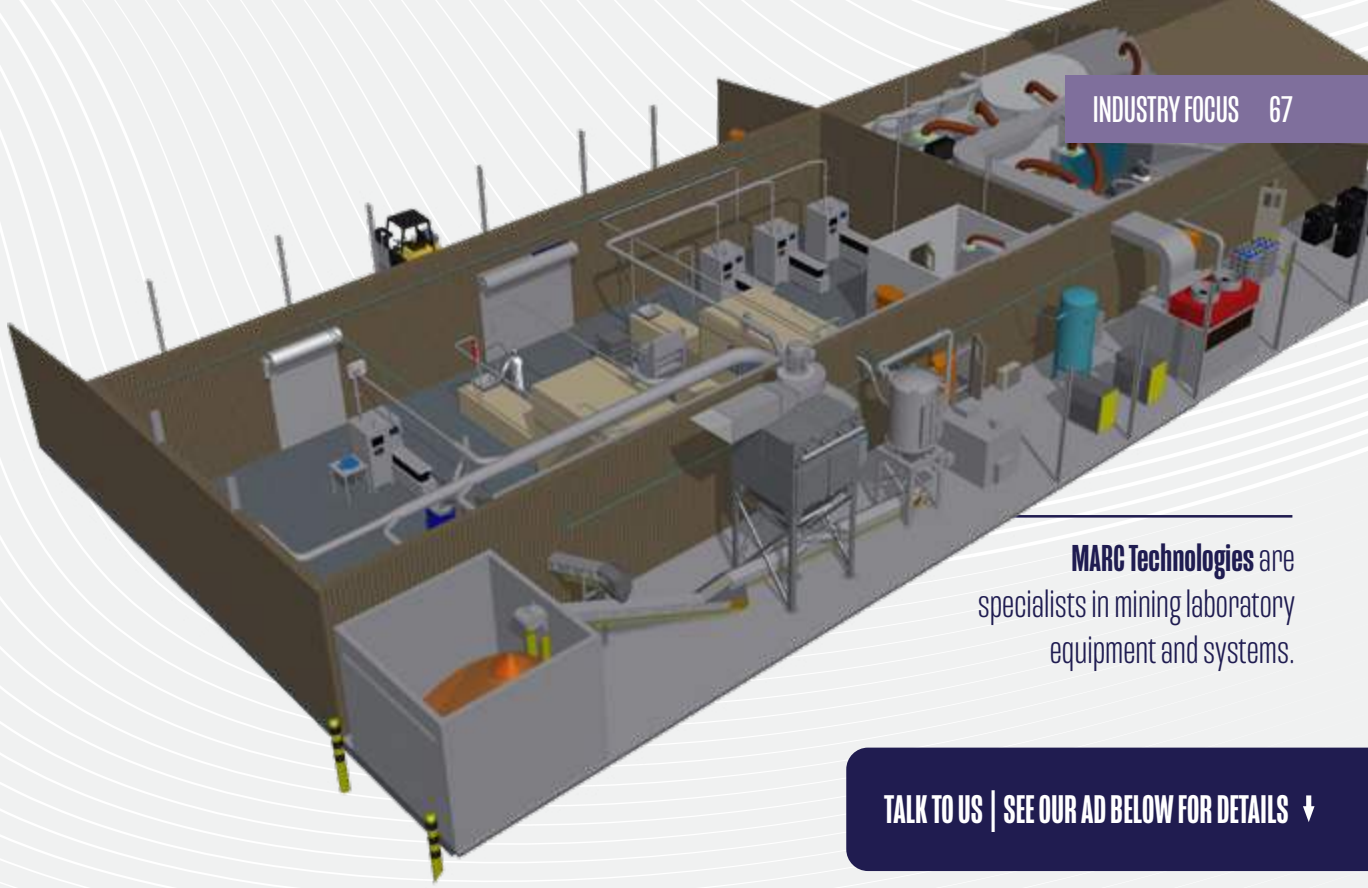
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Unfortunately, many equipment suppliers claim to be able to design a laboratory –it helps them increase their scope and sell more.

No qualifications or certifications are required to design a laboratory, but very few accept they are then responsible for the creation of a structure that may potential-

ly expose end-users to some of the most hazardous chemicals, gases and fumes used in industry.

The most frequently observed error is the lack of consideration of makeup air.

This shows a lack of real-world understanding of the risks involved in working with aggressive mineral acids and organic solvents during the design phase of the laboratory supply package.

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# HIGH-PERFORMANCE BUCKET LEADER

David Singleton, Austin CEO and Managing Director

## CONTINUED FROM THE FRONT COVER...

Also key to the efficiency of operations is improving bucket performance by pass matching buckets to haul tray capacity and reducing the number of passes to load. Austin has developed a new range of HP (High Performance) buckets suitable for fitting to almost all OEM equipment from front end loaders to excavators and face shovels all the way up to the largest rope shovels. The HP series together with the range of Mainetec-designed Hulk buckets are able to be operated without liners to reduce weight and increase ore movement per pass whilst reducing dig energy. Innovative wear liner package to suit local conditions and in high wear areas can be added as required.

What sets Austin apart is this focus on providing the most capable and productive bucket for every application. Whether an operation requires high-production lightweight buckets or demands the rugged reliability of heavy-duty armoured counterparts, each bucket undergoes a comprehensive process of custom design and engineering. This approach tailors each bucket precisely to a mine site's unique application requirements, guaranteeing an optimal fit for specific operational needs.

Austin has invested in building its manufacturing capacity and upgrading all of its facilities globally to better service its customers and meet their specific requirements and timeframes. Austin's facilities are located in key global mining regions allowing the company to deliver to customers on time and at competitive rates. The recent upgrades have also allowed Austin to allocate more capacity to key customers, and to meet increased orders. Installation of advanced manufacturing systems mean all of Austin's facilities can manufacture the highest quality products using the latest design and innovation. A current recurring revenue stream of 89% is a testament to Austin's performance.

Acknowledging the complexities and challenges of the mining sector, Austin be-

comes an integral part of mining company teams, dedicated to enhancing operational performance and contributing to the overall success of mining endeavours. As a strategic partner, Austin provides a wealth of expertise, innovation, and support.

Austin has key locations on both the West and East coast of Australia, in Batam in Indonesia, Chile and Wyoming in the USA, which services all of North America. Headquartered in Perth, Australia, Austin also collaborates with mining companies, contractors, and equipment manufacturers to deliver engineering solutions such as underground truck trays, water tanks, and tire handlers for multi-commodity underground and open-cut operations.

Austin also provides customers with its state-of-the-art condition monitoring software, Mainetrack. Mainetrack is Austin's condition monitoring software system that monitors wear and condition of a mining bucket or truck tray through its life, both individually and across an entire fleet. The system predicts when a bucket will hit its wear limits and needs to be scheduled for rebuild. This helps prevent unplanned breakdowns and assists in scheduling rebuild or repair programs.

In 2022, Austin acquired Australian bucket manufacturer, Mainetec, and is now offering Mainetec's high-value dipper buckets into its global markets, particularly North and South America, where there is high demand and a large dipper bucket market. Austin sold its first Mainetec-designed dipper bucket into the USA market in 2023. The Armadillo electric rope shovel dipper bucket is due for delivery in 2024.



## Austin's CEO and Managing Director, David Singleton

"I am extremely proud of the work that the Austin team has achieved over the past 12 months.

Our industry-leading buckets have continued to be at the forefront of innovation, and deliver the best results for our customers."

## What sets Austin apart from other mining service providers?

"Austin's goal is to provide best in class products to the mining industry. We have invested in designing and manufacturing products for increased efficiency like our stronger and more lightweight High Performance (HP) Bucket and High Performance Tray (HPT) range, which are receiving significant market interest.

We currently have five major manufacturing sites across four continents, which has allowed us to maintain schedules and delivery times in a capacity constrained market through the extensions to our facilities in Batam, Indonesia, Australia and Chile. We are now preparing to expand our USA operations. Through our network of operations, we can deliver to any customer in any global location.

We have also built up our customer support business and bucket rebuild businesses to make sure that onsite operations are maintained at the most efficient level.

Our design and engineering capabilities also set us apart. Austin has designed and



manufactured products for the mining industry for more than 50 years and we have consistently maintained our high standard of innovation and excellence to create world-leading customised products."

## Austin has been in operation for over 50 years, how do you keep ahead of new competitors?

"We focus on delivering a high return on investment for our mining clients in the belief that what delivers benefit for the customer will deliver strong demand for Austin. It's a formula that works well. Our way of doing this is through innovation and customisation of the product to the exact requirements of the mine, knowing that every operation is unique and that one size does not fit all.

Our teams of engineers are working constantly to create the highest quality products for our customers that exactly meet their mining requirements, and drive efficiency in operational performance. Since Austin was formed in 1969, Austin has set out to create the lightest and highest quality products to best suit our customers' needs, and we continue to live up to this philosophy.

We identified Mainetec as an innovative and entrepreneurial business that fitted our strategy to become a leading designer and manufacturer of customised mining buckets. The acquisition of Mainetec has allowed us to significantly grow our bucket market offering domestically, and we have commenced marketing our buckets internationally with a particular focus on the Americas, where a large dipper bucket market exists."

For a comprehensive overview of Austin's product range and to explore how its expertise can elevate your mining operations, visit [austinen.com](http://austinen.com). Partner with Austin, where innovation meets excellence, and redefine the future of high-performance mining buckets. **AMR**





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# IMPORTING HAUL TRUCKS INTO AUSTRALIA, BIOSECURITY COMPLIANCE

**If you are shipping used machinery to Australia, be aware that stringent biosecurity requirements are policed and the penalties for non-conformance include re-export of the machinery. If you have been involved in shipping used haul trucks into Australia, for any length of time, chances are that you – or someone you know – has a story about haul trucks being re-exported. An expensive story.**

The term, "Biosecurity", as it relates to biosecurity compliance for importing used machinery into Australia, is quite a recent term. The current Australian government agency policing the importation of used machinery into Australia is DAFF – the Department of Agriculture, Fisheries & Forestry. Under the previous government, the department was DAFF – the Department of Agriculture and Water Resources. Prior to that, AQIS – the Australian Quarantine and Inspection Service.

AQIS and the reference to "Australian Quarantine" requirements for importing machinery into Australia were superseded with the introduction of the Australian Biosecurity Act, 2015. In simple (much abbreviated) terms, goods are classified under the Act as prohibited imports, non-prohibited imports or conditionally non-prohibited imports. Used machinery falls under the latter classification, which means that they are a prohibited import unless certain conditions are met which allow them to be imported. Effectively, this means that **used machinery is a prohibited import into Australia unless it is as clean as new.**



Any used machinery arriving at the Australian entry port that is not compliant with this condition, is therefore deemed to be a prohibited import.

All used machinery entering Australia is inspected for compliance by a DAFF biosecurity officer at the port of entry. If a biosecurity officer suspects, on reasonable grounds, that the level of biosecurity risk associated with goods that are subject to

biosecurity control is unacceptable, "...a biosecurity officer may take possession of the goods and cause them to be exported from Australian territory, destroyed or otherwise disposed of."

Many Australian importers of used machinery have had the unfortunate experience of having to pay the costs of shipping their machine back out of the country, arranging offshore machinery cleaning and then re-importing it once the required level of biosecurity cleanliness had been achieved. Mining assets are still being re-exported as frequently as ever. There have even been cases of the same machine being rejected and re-exported twice. If you are bringing used machinery to Australia, you simply need to ensure that the machinery is as clean as new – inside and out – before you ship.



When used machinery arrives in Australia, the primary biosecurity inspection (initial inspection) takes place on the wharf, as cargo is discharged from the ship it arrives on. The inspecting DAFF biosecurity officer will typically spend 60-90 minutes conducting a thorough visual inspection of the machine, looking for any visible contamination – all over the machine, under the machine, inside track frames, behind belly plates, in every joint and cavity and crack and crevice, so you'll need to do a very thorough job cleaning your machine to Australian standards.

If there is no obvious contamination, the machine will pass the first biosecurity inspection and be permitted to proceed to an approved site, defined under the Biosecurity Act 2015 as, "an arrangement, approved by the Director of Biosecurity, that provides for a biosecurity industry participant to carry out biosecurity activities to manage biosecurity risks associated with specified goods, premises or other things."

Secondary inspection will take place at the Approved Arrangement. This will likely include partial dismantling of the machine to access any areas the biosecurity officer



could not inspect intact. This will typically involve the removal of any wiring conduit and will commonly involve taking off components such as the operator's cab, fuel tank, wheels, etc. If there are any holes, ruptures, splits, cracks or fresh welds, the inspecting DAFF biosecurity officer will direct the importer (or the forwarder/customs broker/Approved Arrangement personnel on behalf of the importer) to cut open those sections for high volume flushing, under DAFF supervision. Radiators, too, will **always** be flushed as part of this secondary inspection. Cavities in a haul truck dump body can conceal tonnes of biosecurity contamination. Anywhere water can reach, biosecurity risk material can reach!

Australian-owned and operated, heavy freight specialist, Freightplus, leads the market in the importation of used haul trucks into Australia.

The majority of their customers engage Freightplus to take care of their biosecurity concerns and mitigate the risks of importing their used mining assets into Australia. Since 2002, Freightplus has been providing relatively low-cost biosecurity services and, to date, has maintained a perfect 100% pass rate for machinery the company has inspected pre-shipment.

## What is a Freightplus biosecurity pre-shipment inspection (PSI)?

In a nutshell, it's this: Freightplus sends one or more of its biosecurity compliance inspectors to the location at which the used machinery is being cleaned for ship-

ping to Australia, here they conduct exactly the same inspections as the DAFF biosecurity officers will carry out at the Australian entry port. The Freightplus biosecurity inspector will then assist the local cleaners to achieve the necessary level of cleanliness for importing used machinery into Australia. Once the inspector is satisfied that the machinery is clean enough to ship to Australia, he will issue a Freightplus Certificate of Cleanliness, guaranteeing the assets against re-export. In addition, to the guarantee against being re-exported, users enjoy significantly reduced cleaning time and costs once their assets arrive in Australia. A recent consignment of used CAT 793Ds, washed in China by the Freightplus team, were cleared by DAFF at the Port of Brisbane, without any further cleaning required.

The company's offshore cleaning services and pre-shipment inspection services are available to anyone shipping with Freightplus. You will be surprised at just how cost-effective these pre-shipment inspections are. Certainly a worthwhile investment for any astute company importing used machinery into Australia or selling used machinery to Australia. **AMR**



For more information, visit [www.freightplus.com](http://www.freightplus.com), email [mail@freightplus.com](mailto:mail@freightplus.com), or call Freightplus co-founder and CEO, John Gleeson, on +61 414 980 380.





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# IS THE CAPITAL COST OF YOUR GRINDING CIRCUIT TOO HIGH?

Authors: Greg Lane, Phil Dakin, Tim Doddridge and Matt Pyle - from Ausenco

The designs for most large comminution circuits are capital-cost inefficient. High capital costs are usually due to expansive layout of equipment and facilities due to lack of cost accountability in engineering design. This leads to grinding floor elevations too high and/or footprints too big; too much concrete; too much steel; design margins too high. Many of these issues arise from the fundamental paradigms associated with grinding circuit design that form the basis of “what good looks like” within engineering companies or owner’s teams.

Most of the capital cost in a grinding circuit is driven by design fundamentals, and the capital cost can be reduced by 20% or more by optimising mill layout, crushers, and associated equipment, whilst improving operability or maintainability.

Five focusing questions can be used to explore and study the links between good design, capital cost, and project schedule:

1. What key elements of process design and equipment selection optimise value for a given circuit?
2. What does a good design look like, and how can parametric checks be applied?
3. What are the key elements of a well-designed and capital-efficient grinding circuit?
4. How does capital-efficient design tie into good operability and maintainability?
5. How does an engineering management approach add to or detract from a grinding circuit’s project value?

Benchmarking good design is based on experience gained following the start-up

of each plant. Plant accessibility and ease of operation, aspects of design that benefit or detract from operating cost and ease of plant maintenance need to be considered. As an example of the differences good design can make the concrete intensity ( $\text{m}^3$  concrete per kW grinding mill installed power) is 50% lower for a smart design than a typical layout (Figure 1).

If seismicity is low and ground conditions are good, a good target is  $0.15 \text{ m}^3$  concrete per kW of installed motor power.

Targets for bulk-material quantities need to be adjusted for client requirements, material flow characteristics, site climatic conditions, seismic conditions, wind conditions, and geotechnical data, as data are received. However, a good engineering manager or engineering lead will establish the bulk material quantity targets based on experience, then effectively manage change as new information comes to hand. Continuous review is required to

control the inevitable “creep” in design, as conservatism often substitutes for good experience as a project develops.

Optimisation of capital cost can be achieved by the following building size reduction opportunities:

- Height is set by the mill floor and cyclone heights.
- Footprint is set by mill centre distances for a side-by-side arrangement or combined mill lengths for end-on-end arrangement.
- The maximum footprint reduction is typically achieved in the side-by-side arrangement because of the synergy with the surrounding mill platforms.
- Mill height can be reduced by:
- Optimising the pump-box volume to an efficient retention time (45 seconds is sufficient), therefore reducing height.
- Mounting the SAG discharge vibrating screen on top of pump box, or if a trommel is used, lowering the

trommel screen with minimum clearance to pump box.

- If girth gear waste grease drum does not have height clearance, then use a dual drum system.
- Cantilever any wound rotor induction motor plinths to reduce the length of the concrete raft.
- The concrete raft should be at least the width obtained by projecting lines at  $30^\circ$  on each side of a vertical line through the mill axis to the base of the raft. Therefore, the higher the mill the wider the required concrete raft.

Cyclone height can be reduced by setting the cyclone underflow to discharge  $10^\circ$  (slope) into the lower portion of the mill feed box to minimise the cyclone height and reduce pump power. A cyclone working mass can be over 300 tonnes, which is costly for an unduly elevated structure.

The advantages of a well-designed side-by-side versus end-on-end mill arrangement are listed below:

- Smaller footprint (approximately 15%–20%), consequently lower concrete, steel, cable, and piping costs, and shorter schedule.
- Common reline floor.
- One fewer pebble conveyor and transfer station possible.
- Wet area spillage and clean-out and scats bunker can be on outside of plant, not in the centre.
- SAG feed conveyor can be shortened (approximately by 10–20 m) by removing convex curve.
- Structural steelwork is reduced (approximately 10%–15%) by not duplicating structure (as required for an end-to-end arrangement).
- Opportunity to easily direct a portion of cyclone underflow into SAG mill.

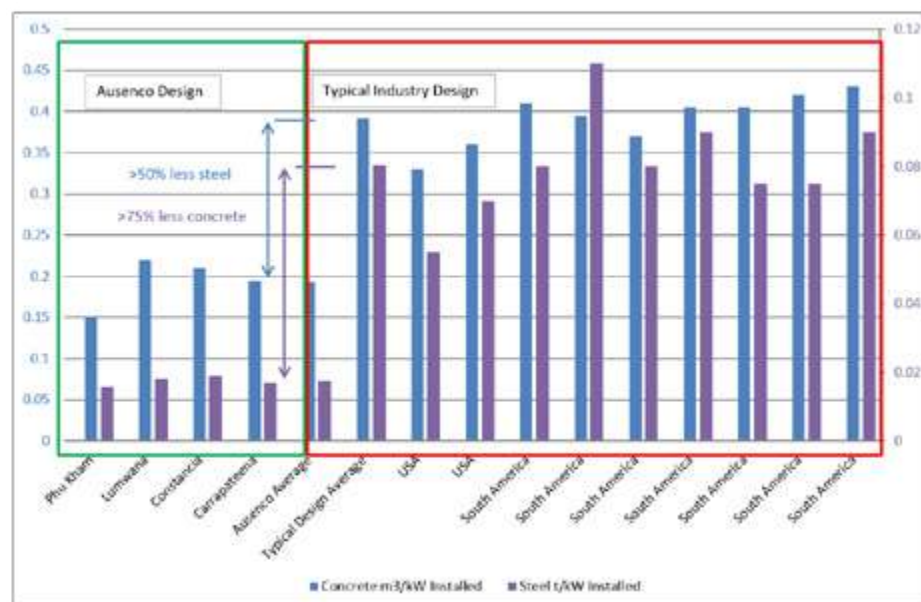


Figure 1—Concrete and Steel Intensity Benchmark Data for Grinding Circuit in Cu Concentrators



Lower operating costs are facilitated by the following:

- Lower cyclone height to reduce pumping power
- Reducing the number of bends in cyclone feed and cyclone underflow return lines to minimise wear and bend replacement. Use a boil box (Figure 8) when appropriate.
- Discharging pump from the bottom, horizontally, to reduce pump wear.
- Lowering mill height to reduce power required for conveying ore and water addition.
- Optimising building to reduce heating, ventilation, and air conditioning, and associated costs.

A project manager's capability "to support the team to perform at maximum capability" is a key driver of good design, particularly in maintaining a high level of clarity from the client interface to the drawing floor. Engineering managers need to be able "to lock down the scope", understand "fit-for-purpose design", engineer to a cost target, assign responsibility, support the leads, and motivate the team.

Simplicity in approach is a key requirement when defining design, procurement and construction packages. From a contracting perspective, the engineer needs to be engaged in a way which "rewards" good behaviour, i.e., to minimise the total project cost to the owner.

For example, fixed-price-per-deliverable models, whilst convenient from a cost-and schedule-control perspective, create an illusion of "good value", but actually incentivise the engineer to maximise margins by copying and pasting designs, or designing based on conservative rules of thumb.

The engineer is rewarded for delivering

documents (many of which are often unnecessary for construction) in the least possible engineering time rather than designing to minimise the total installed costs and delivery schedule. These copied or conservative designs are typically suboptimal for the project and inflate overall capital costs significantly. Furthermore, the owner can end up paying high engineering margins whilst inflating total project cost, through a false economy of perceived cost control.

Nearly all constructed projects inevitably have opportunity for optimisation and improvement when viewed retrospectively. This may be pipe racks too lightly loaded, too much concrete, steel, piping, and so on, based on excessive footprint, over-design of bracing, or one or more of many other design-related outcomes. Some of these decisions that cause these outcomes are related to risk management.

However, many decisions are related to the style and history of reference projects that are used as the benchmarks for design, and not knowing "what good really looks like". At other times, it can be that the engineer has developed a design without managing the specific design constraints carefully and purposefully, or is not aware of the cost and financial performance implications of various design decisions.

Breaking the paradigms and challenging engineering norms (within design codes) can reduce capital cost and add significant project value.

The critical decisions are made early in engineering and design, and often during a study phase. Hence, the challenge process needs to be effective and thorough, and the constraint becomes the baggage that we all carry from our past experience.

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# GEMA: A Revolution in Material Analysis

**P**ortable Spectral Services is pioneering development of spectral technology, at the forefront of both field and laboratory analysis. The latest offering, GEMA (**General Element Material Automation**), showcases team commitment to innovation and excellence, with a range of features representing a significant leap forward in mineral analysis which make it a potential mining industry game-changer.

## Rapid and Non-Destructive End-to-End Analysis

One key feature of GEMA is its End-to-End **rapid and non-destructive analysis** of samples using XRF technology. This powerfully combines with co-bot automation and integration into a digital spectral laboratory system to deliver on-time results to the client portal while preserving the sample spectral DNA. This is a significant advancement in the field of mineral analysis, and fits growing global expectation for reducing waste and increasing sustainability performance.

## High-Resolution Material Element Mapping

Another major advantage of GEMA is its ability to map large samples at a high-resolution using Bruker's micro-XRF, up to **20um resolution**. This high-resolution mapping generates a detailed sample

view, yielding identification of small-scale variations of material chemistry, which could be crucial in determining its composition and origin.

## Quantitative Data

Data produced by GEMA is comprehensive and includes **quantitative geochemistry, mineralogy, spatial data** such as liberation and locking, grain shape, grain size distribution and characteristics. Collectively this provides a complete picture of a sample, enabling researchers and mining companies professionals to make informed decisions. Typical sample types include thin sections, heavy mineral concentrates, sands, and RC chips, and is adaptable for drill core and more.

## Streamlined Process

GEMA streamlines the process of sample analysis from start to finish. At the front-end samples are logged, weighed, and barcoded into the GEMA LIMS system. This information passes to the AM4 system where samples load into the micro-XRF.

## Automation and Capacity

Automation is a key feature of GEMA. Samples are automatically scanned, photographed, and loaded into the micro-XRF by the AM4 robot. This automation both reduces human error and increases the

speed and efficiency of the process. A buffer rack provides up to **4 days' worth of capacity**, and the rapid scanning allows for up to **200 samples a day** with scalability when utilizing additional micro-XRF's.

## Wide Range of Measurement

The GEMA micro-XRF measures elements from **Carbon to Uranium**, to support analysis of any mineral system or commodity including base metals, precious metals, rare earths, nickel sulphides, laterites mineral sands and LCTs etc.

## Real-Time Interpretation

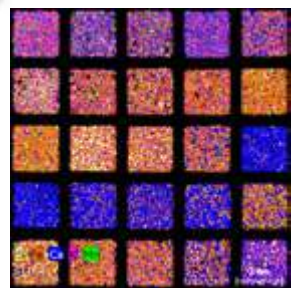
One of the most significant advantages of GEMA over traditional delivery of analytical and mineralogical data is the ability for clients to interpret samples in real-time using API's and Apps (e.g. Headless GAS) on the GEMA portal.

GEMA represents a significant advancement in the field of mineral analysis providing rapid, non-destructive, and high-resolution sample analysis enhanced

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Example of HMC chemistry mapping on the micro-XRF



by automation and real-time interpretation capabilities. To learn more about how this exciting development of a valuable new tool can enable your mineral exploration, mining, or research contact Portable Spectral Services. Stay tuned for more updates on this exciting development in the world of mineral analysis! **AMR**



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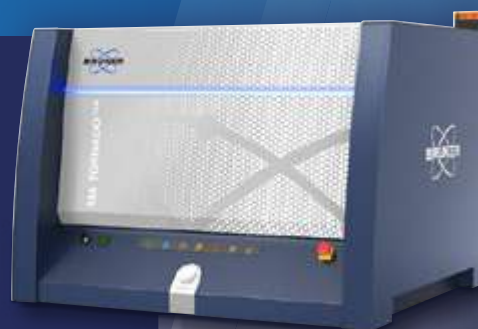
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HAWK's ORCA Sonar Bed Level System will measure up to two density interfaces simultaneously.



HAWK's ORCA Sonar System shown in a thickener application

# SONAR BED LEVEL MEASUREMENT FOR AUTOMATIC THICKENER CONTROL AND AUTOMATED FLOCCULANT DOSAGE

The tailings dewatering process can represent a significant operational bottleneck within washery operations as limitations of water licenses control the amount of new fresh water that can be taken from aquifers, water courses, or municipal sources.

In addition, environmental considerations limit both the quality and volume of water that can be discharged on a site with a given operating license.

Generally, this requires that mining operations with washeries or processing plants undertake significant water recovery processes (referred to as dewatering) in both tailings disposal processes and concentrate thickeners to recycle water for reuse within the washing or mineral processing process.

The main dewatering tool utilized is the thickener, a generally open, wide, squat tank with a conical bottom.

The thickener's primary job is to allow particulates to settle to the bottom of this tank and be raked into the bottom of the cone, where it can be pumped as a slurry or paste, often called the thickenate, which is pumped generally either to tailings dams (in tailings applications) or filter presses (in concentrate applications).

Clear water is allowed to spill over the edge of the tank (referred to as the launders), where it is pumped to be reused in washing or concentration processes.



HAWK's ORCA Sonar system provides a cost-effective way of automatically monitoring both the Bed Level and Hindered layer level, allowing for complete monitoring control and automation of thickener operation

The natural settling rate of particulates within a thickener is generally too slow for the allowable thickener size to be able to handle the input rate of particulates, and in some cases, the chemical or physical properties of the particulates mean that settling will not naturally occur at all, requiring chemical intervention.

This is generally achieved by the introduction of two classes of chemicals:

## Flocculants:

Commonly Alum, Ferric Chloride, Ferric Sulphate, or other proprietary chemical blends.

These chemicals increase the rate of settling of particulates by neutralizing the negative electric charge that suspended particles tend to carry in the water column.

## Coagulants:

Commonly PolyAMINES, Melamine Formaldehydes, or other proprietary chemical blends.

These chemicals cause suspended particles with a negative charge to be attracted to the positive charge of the coagulant, meaning that the suspended particles start to "clump" around the coagulant, and these large clumps quickly settle in the water column.

Typically, flocculants are dosed at either a given rate (often recommended by the company providing the flocculant) or at a controlled rate where the thickener is being monitored for condition.

Coagulant (often a much more expensive chemical) is generally used in an emergency situation where suspended particles are overflowing into the launders, contaminating the clear water.

Thickeners are, in their most basic form, a balancing exercise, controlling input and output volumes, flocculant dosage rates,

and other parameters like rake speed or coagulant usage.

Disruptions to this balance can lead to several different issues with the process, including (but not limited to):

## Bogging a Thickener:

An issue where the bed level builds up and overcomes the thickeners' ability to continue removing solid matter.

This worst-case scenario involves shutting down operations and excavating the material out of the thickener before restarting the process.

## Contaminating the Recycled Water with Particulates:

- When the settling layer overflows into the launders, contaminating the water supply for other downstream processes.
- Requires Coagulant to bring thickener back into balance, which may be expensive.

## Overuse of Flocculant:

- Over-flocculating is a particularly costly waste and may have other downstream effects.

Best practice for thickener control is to have an autonomous thickener monitoring and control process by which the different thickeners and the use of automated control based on the monitoring of a thickener's condition and undertaking small, controlled adjustments in flocculant dosage and underflow pump rates.

Both underflow density and torque are generally measured by OEM installed sensors (such as nuclear density gauges on underflow pipes), whereas rake torque is measured by load cell, hydraulic pressure, or motor power consumption.

When looking at a holistic automation system for thickeners, though bed level and hindered layer level (the layer in which particulates are settling out) should

also be measured to allow for complete automatic control of the thickener.

HAWK's ORCA Sonar system provides a cost-effective way of automatically monitoring both the Bed Level and Hindered layer level, allowing for complete monitoring control and automation of thickener operation.

The ORCA's standard configuration is a handrail-mounted Sonar System (generally mounted one-third of the way in from the outer edge of the thickener).

The sonar sensor itself is supported on a long pole that holds the sonar in the water, which is connected to an actuator that dips the transducer in and out of the water to shear off any fouling or bubbles that may start to accumulate on the face of the transducer to ensure ongoing and reliable operation.

In conclusion, the challenges faced in tailings dewatering processes within washery operations are substantial.

Limited water licenses, environmental considerations, and operational efficiencies demand a sophisticated approach to water recovery.

Thickeners, although fundamental in this process, require meticulous balance and control.

The introduction of chemical agents like flocculants and coagulants plays a vital role in enhancing the settling rate of particulates, but their use must be carefully managed to avoid issues such as bogging, water contamination, and excessive costs.

The key to overcoming these challenges lies in adopting advanced monitoring and control systems.

Hawk's ORCA Sonar system represents a significant leap forward in this regard.

By providing accurate and real-time measurements of bed level and hindered layer level, ORCA Sonar enables complete automatic control of the thickener operation.

This not only ensures more efficient water recovery but also minimizes the risk of operational disruptions and excessive chemical usage.

To fully harness the potential of your thickener operations and to stay ahead in the challenging environment of washery operations, contact Hawk Measurement Systems for a risk-free trial of the ORCA Sonar System today. **AMR**





# Thickener Bed & Settling Layer Problems? Measure Both Interface & Bed Level Simultaneously with One Sensor

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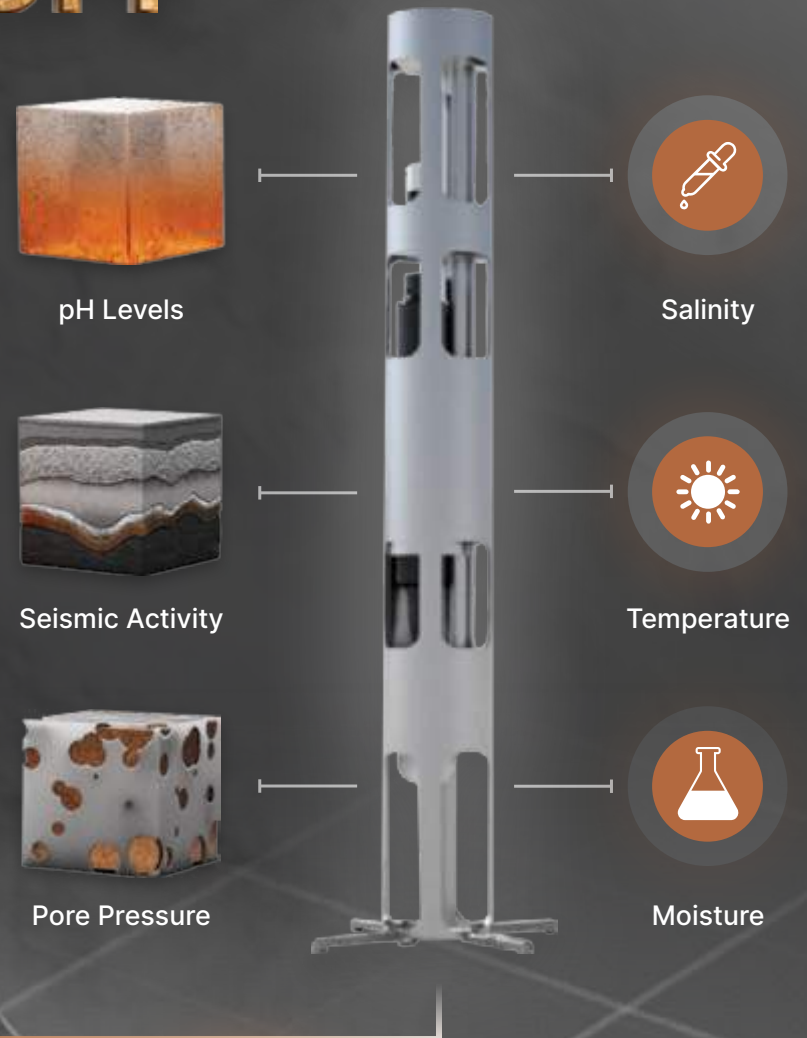
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Mining hydraulic systems rely on critical components like pressure sensors to provide vital safety insights for operators. However, traditional wired gauges used in these systems are inconvenient and pose inherent risks, including the potential for crush and fluid injuries.

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While traditional wired gauges present safety risks, Bluetooth Pressure Transducers offer a solution by enabling remote monitoring. This advancement enhances

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### Efficient Testing with MultiGage Software:

Streamlining hydraulic testing processes, the MultiGage software allows simultaneous readings from up to 14 gauges with Apple IOS and Windows platforms. The elimination of conventional cables through wireless connectivity reduces operational complexities.

### Compatibility and User Interface:

Bluetooth transducers are compatible with Android, Apple IOS and Windows platforms, providing operators with flexibility in using their preferred devices. User-friendly interfaces ensure a seamless integration into existing systems.

### Tailored Kits for Diverse Requirements:

Our kits are customised to meet specific needs, offering a comprehensive range of transducers spanning from 50 PSI to 15,000 PSI. Fully equipped kits ensure immediate readiness for field applications.



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Contact LiveGauge to discuss your specific needs and take a step towards eliminating risks in your mining operations. **AMR**

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## ELIMINATE LIVE WORK



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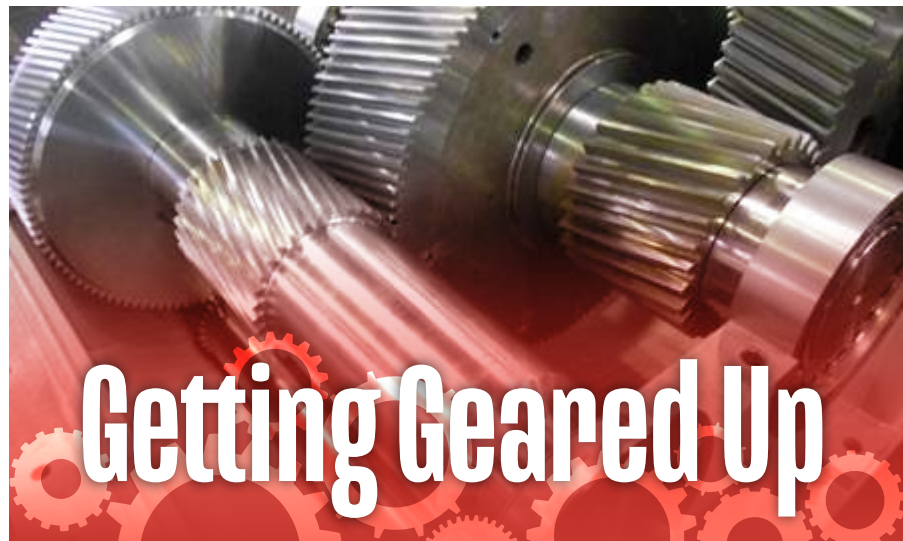
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**S**hute-Upton Engineering is keeping the wheels of the Australian mining industry turning with their first-rate industrial gear services.

Established in 1957, the Queensland based company is a leading manufacturer for all types of industrial gears and gearboxes, performing all design, cutting, grinding and hobbing in-house.

With a dedicated and highly trained staff, the business is able to specialise in all areas of industrial gears precision machining as well as general work and metal fabrication.

On the team are several evaluation and inspection professionals, qualified tradespeople, and support staff, making the 65-year-old company a market leader in mining engineering, design, repair, and gear manufacturing, as well as winches and other industrial parts.

Shute-Upton Chief Executive Officer Ian

Thomas said the company uses materials such as high-strength heat treated steel and advanced manufacturing tools like CNC gear cutting machinery to deliver a durable product.

He said these measures guaranteed a high-quality service and very fast turnaround times.

"To start, clients receive a free quote and project timeframe," Mr Thomas said.

"We have in-house design and reengineering wherever needed and can offer total disassembly, cleaning, inspection and condition analysis when a gearbox needs to be repaired.

"It is essentially a full project management offering, with substantial quality control measures and testing.

"And, because we know a lot of projects operate continuously, we offer blanket 24-hour emergency support.

"You can reach us when you are in critical need at any time."

Among the company's most popular services was the repair, overhauling or refurbishing of existing gear, which has been proven to save project operators on downtime costs.

Comparisons have found gear restoration to original specifications was often cheaper than re-ordering a replacement part, while any upgrading of materials or design parameters could be easily made when necessary.

With some clients in need of parts that have become unavailable or hard to find, Shute-Upton has also added reverse engineering to its service offering. The business can extend the service life of existing industrial equipment and systems by accurately and quickly remanufacturing any industrial gear.

Mr Thomas said Shute-Upton had a pro-

cess based on experience that had been developed for over half a century and was uniquely placed to accommodate the mineral resources sector.

He said operators interested in learning more should not hesitate to get in touch.

"We operate from a large and technologically advanced factory workshop in Brisbane," Mr Thomas said.

"We are a modern workforce of professionals with an unrivalled pool of knowledge.

"Get in touch for all your gear and gearbox needs."

For more information, visit [www.shute-eng.com.au](http://www.shute-eng.com.au)  
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## Get into Gear with Shute-Upton Engineering

- Winch manufacture, design and overhaul
- Manufacture of gears, shafts, splines, sprockets to drawings or samples
- Overhauling all makes of industrial gearboxes
- Ratio changes
- CNC gear cutting and profile tooth grinding
- Heat treatment - hardening of gears, splines and sprockets
- CNC machining and grinding
- Manufacture and machining of any and all parts to keep the mining industry moving

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### What makes us different



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All Job Dimensions



Over 56 Years' Experience



# PROLUBE Lubricants

Prolube Lubricants is an Australian Owned Oil Company established in 1988 to formulate, manufacture and market a diverse lubricants, greases, and specialty products range. Prolube Lubricants are specifically formulated to perform and protect under the arduous Australian climatic and operational conditions meeting the most stringent of Australian, international and OEM specifications.

Prolube Lubricants head office and newly constructed manufacturing facility is based in Brisbane, Australia where we distribute and service our customers throughout Australia, New Zealand, PNG, and Fiji. This network of locations enables us to provide local support and local prompt service that our customers require.

Prolube Lubricants offer a wide range of products specific to segment and market, this includes engine oils, transmission fluids, gear oils, hydraulic oils, greases, and a diverse range of specialist products.

Prolube Lubricants is the exclusive partner of Petron Open Gear Lubricants (OGL) in Australia. Petron Corporation is a globally recognised company that specialise in open gear lubricants working with Original Equipment Manufacturers such as CAT/Bucyrus, P&H, Komatsu, David Brown Santasalo and more, to help lubricate mills, kilns, shovels, draglines, and ancillary mining equipment.

To find out more, visit [petroncorp.com](http://petroncorp.com)

## Condition Monitoring / Reliability Engineering

At Prolube Lubricants, we have experienced lubrication engineers who will work with you to understand your equipment requirements and recommend a program to meet your specific goals and objectives. The program is designed to help you maximise the benefits of our products and technical services by providing a customised program for planning and implementing a proactive approach to your equipment lubrication and maintenance.

You can track the performance and results of our products and services, helping you quantify the benefits to your business, which could include:

- Extended equipment overhaul
- Continuous improvement in your lubrication program
- Less unscheduled equipment downtime
- Less energy consumption
- Fewer replacement parts
- Reduced purchasing costs
- Less lubricant consumption and waste
- More effective maintenance control
- Safe and effective operation processes

Prolube Lubricants offer engineering services over a wide range of industries and applications. Some of the services and inspections include:

- Ball/SAG/Grinding Mill Inspections
- Dragline and Shovel Inspections
- Open Gear Inspections

## Lubrication Solutions Tailored to the Mining Industry



- Hydraulic System Inspections
- RCA and Tear Down Inspections
- Thermography
- Used Oil Analysis Program
- Sample Point Installation
- Sample Collection and Reporting
- Oil/Fuel Storage & Handling Audit
- Cleanliness & Contamination Audit
- Technical Lubricant Training



# PROLUBE Lubricants



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# GBGGROUP

gbg-group.com.au

The GBG Group, is a multi-national company providing consulting expertise in engineering investigation services since 1982.

The company has offices in Cambridge, London, New York, Colorado, Los Angeles, Sydney and Perth and a total staff of 120 scientists and engineers.

In Australia, we are currently a preferred consultant for geophysics for geotechnical and environmental purposes for Rio Tinto, as well as working with Newmont, BHP, FMG, South 32, Evolution and numerous smaller miners. We are also the preferred geophysical consultants to a number of the tier 1 engineering and geotechnical companies such as Advisian (Worley), WSP, ARUP, GHD, AECOM, Jacobs, John Holland and Monodelphus.



## Mine Geophysics

Geophysics has a long history in the exploration sector of mining, but within the last 20 years it has become more commonly used within active and planned mining areas.

Both surface and downhole geophysical methods are used to assess sub surface geotechnical properties (geohazards), environmental issues and hydro geology. This may be for full mine planning, or for specific sites such as tailings and processing facility design, roads, rail, pipeline routes and port infrastructure. Geophysical methods are used in conjunction with standard geotechnical and environmental investigation methods to increase the knowledge base for the site to provide a more holistic and robust view.

The GBG Australian offices in both Sydney and Perth have a history of 20+ years of working within the mining sector.

Undertaking projects as diverse as mapping rock head under a lake above an active coal mine, to assessment of liquefaction potential for sediments under a proposed large TSF in Papua New Guinea.

GBG Operate across Australia, Asia and the Pacific with our projects ranging in size from a few days on site to multiple team mobilisations for spanning months for larger projects. We have also just extended our presence in the USA to an office in Colorado to provide the same geophysical capability in the North and South Americas.





# Tailings Dams

The two Australian offices have significant experience within the assessment of Tailings Storage Facilities (TSF)

Whether it is prefeasibility geohazard / geotechnical investigations or post construction investigations for durability or environmental issues, we have the staff and equipment to meet the task.

TSF's pose a significant long-term risk for mining companies. They are often extremely large in area, contain significant contamination and will be present on the mine site long after the mine has closed. As such, the construction design and long-term monitoring and maintenance of these facilities is extremely important especially considering the implementation of the Global Industry Standard for Tailings Management (GISTM) which will become worlds "best practise" approach to tailings storage.

Based on the requirements of this new standard and in combination with the Australian produced Leading Practice Sustainable Development Program for mining industry (LPSDP), GBG Group have designed a product we call "Tailings First" which is centred around our experience of using geophysical, geotechnical, and environmental investigative methods to provide a comprehensive approach to understand the ground conditions before construction or extension. This includes how the dam bund walls are constructed and performing in undocumented facilities, hydrogeology, and baselining contaminant spread, as well as the provision of ongoing Realtime monitoring services using the "Overwatch" probe system created by our partner company Hermes & Soteria.

Currently we are working with a number of major mining companies and their engineering teams in undertaking audits of existing dam structures for compliance with the GISTM as well as pre-feasibility ground geotechnical studies for new TSF constructions.

The team in the GBG Group offices in Australia have the expertise and equipment to undertake nearly all forms of shallow geophysical investigations and can plan them as "stand-alone" investigations or as part of a full geotechnical or environmental assessment project.

## Downhole Geophysics

Boreholes provide more than just core! GBG has a full suite of downhole tools available to aid in geotechnical assessment of sites. We can undertake acoustic and televiwer imaging of rock structure, bedding, jointing and faults. We have tools to aid in hydrogeological and environmental assessment and can plan campaigns to image tunnels, caverns and old mine workings etc. Techniques employed include surface to borehole and cross hole seismic tomography along with direct measurements for S wave liquefaction potential for structure foundation design.

Contact us for further information  
or visit our web site for details of  
capabilities and case studies.

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# REVOLUTIONISING MINING OPERATIONS WITH AIRIUS: A Leap in Wireless Vibration Sensing



**A**irius LTE-M stands as a groundbreaking innovation in the realm of mining technology, representing a transformative leap forward in wireless vibration sensing. Developed by SPM Instrument, Airius focuses on revolutionising mining operations through precision, safety, and operational convenience.

## The Symphony of Connectivity and Simplicity

At the core of Airius's capabilities is its Symphony of Connectivity and Simplicity,



where it serves not just as a sensor but as a sentinel, providing early warnings for vibration-related issues, gear faults, and bearing failures.

## Cutting-Edge Measurement Technology

The sensor's cutting-edge measurement technology employs a revolutionary MEMS-type sensor with digital output, measuring triaxial vibration and temperature.

With envelope measurement capabilities and a versatile frequency range, Airius adapts to diverse vibration measurement assignments, ensuring a comprehensive understanding of equipment health.

## Simplicity in Setup, Integration, and Operation

According to apt Group GM Geoff Soper, Airius emphasises simplicity in setup, integration, and operation.

"Whether powered by a battery or an ex-

ternal power supply, the sensor effortlessly transfers data via Wi-Fi or secure LTE-M radio technology," he said.

"Meticulous engineering guarantees trouble-free operation, enabling stable monitoring over many years. Notably, Airius is also a green technology due to its replaceable battery, minimising environmental impact and ensuring sustainable use."

## Security and Performance Redefined

Security and performance are redefined with Airius, following Zero Trust principles from sensor encryption to LTE-M communication. The Airius II LTE-M's communication services minimise energy consumption, extend battery life, and provide a strictly secure and reliable solution.

## Empowering Informed Decision-Making

"Airius transcends mere data collection; it becomes an integral part of mining systems, supporting REST API for seamless interaction with other devices and process

control systems, empowering informed decision-making for operational excellence," Mr Soper said.

"The Airius II LTE-M solution requires no routers or proprietary gateways and includes a renewable three-year subscription, ensuring secure, fast, and energy-efficient data transfer between sensors and Condmaster Entity Server."

## Join the Wireless Revolution

Join the wireless revolution in mining technology with Airius, a manifesto for a more connected, secure, and efficient mining future. Its LTE-M technology offers advantages over traditional Wi-Fi, providing a more robust and reliable communication solution in the challenging mining environment. **AMR**

For more information, call apt Group on 1300 700 002, email [info@aptgroup.com.au](mailto:info@aptgroup.com.au) or visit <https://aptgroup.com.au/>

airius

**Airius LTE-M**  
**Precision, Sustainability,**  
**Excellence**

*Elevate your mining future.*

**Start a conversation now!**



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of Companies

**SPM**





# WT's FOR SHUTDOWNS

**W**e Think shuts aren't all the same. The thing that is the same is that all shuts are an opportunity to Work Together.

**Working Together** means customers achieve the best outcome - no matter how small or large the job.

**WT's** brings a skilled team to deliver the results you need. Our Shutdown Team includes:

1. Engineers to assist with project planning, project management and design for system improvement.
2. The Purchasing Department to ensure parts availability and logistics are taken care of without delay.
3. Administration Staff to ensure site access, travel plans and accommodation are sorted.
4. Skilled technicians both on site and in

our workshops to get the work done right.

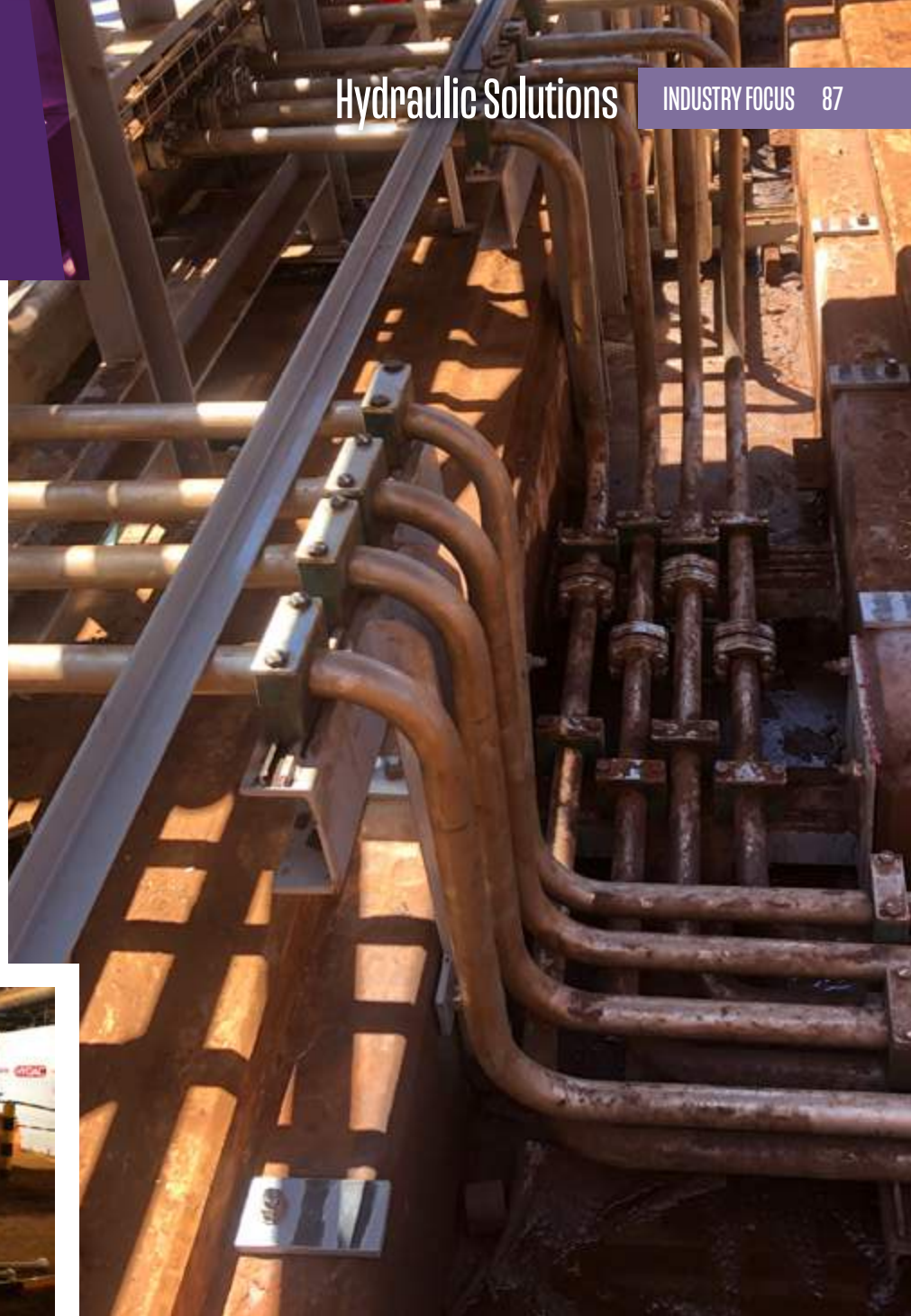
This is **WT's** or **Wise Technology** in action, and the reason **WT Hydraulics** is the best choice.

**WT's** will:

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- install your wheel lock system with 50 mm pipe spools,
- even, change your Apron Feeder plumbing to 80mm ID pipe.

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**We are a busy team so schedule us in now!**  
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Working together we will use this pressure and convert it into the power to drive your production and reduce your costs.

Dynaset HPW pumps are perfect for at the source Dust Suppression systems to improve worker health and safety.

HYDAC H2g0 vacuum dehydration of contaminated oil extends system service life and reduces maintenance.

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Check our website for more information and client testimonials:

**[www.wthydraulics.com.au](http://www.wthydraulics.com.au)**



# SOLUTIONS FOR MINING EQUIPMENT

**K**eeping mining and heavy construction equipment in top operating condition is a constant challenge for today's mining and construction contractors.

Maximising equipment up-time is critical to shortening project completion times and increasing bottom line profits.

Removing equipment from the job site to a repair facility can delay project completion and put a damper on profits.

That is where CLIMAX can help.

CLIMAX has the on-site repair and maintenance machines that will minimise maintenance times and keep mining and construction equipment working for companies and their customers.

Thousands of worldwide mining and construction companies rely on CLIMAX to keep their fleets of tractors, loaders, excavators, draglines, cranes, and other heavy-duty equipment out-in-the field maximizing their profits.

Mining operations are almost inevitably remote, gruelling, complicated, and cramped.

Competition is fierce and profit margins are thin, while downtime can be devastating. In this kind of environment, it is easy to

see why portable machine tools in general and CLIMAX in particular, were discovered by the mining industry long ago.

Companies that serve today's mining industry face formidable challenges.

These include difficulties inherent to the business itself, as well as those caused by a still-uncertain economy.

Mining repair projects, especially those underground, must be undertaken in close, cramped quarters that make an already arduous task even more demanding.

For contractors, even winning a job is a tough task; competition is fierce, customer loyalties tenuous, and concerns with bottom line issues intense.

One of the biggest challenges faced by customers in their work for the mining industry is expediting the rigorous process of underground repairs.

Adjustability and equipment versatility are critical to enable workers to perform a variety of repairs efficiently and effectively in extremely close quarters.

Finding a tool that can meet these demands is a top priority for mining and construction contractors.

The CLIMAX BB5000 is a compact, flexible



line boring machine that installs in 30 minutes.

The line of automated on-site welders interface with the boring bar system, enabling one set-up for both items, to help decrease weld time and improve productivity.

The system's adaptability to bore and welding simultaneously makes it useful for repairs on mining and heavy construction equipment.

Customers trust CLIMAX for mission-critical machining, welding, or valve testing projects, in a wide variety of industries including oil and gas, mining and heavy construction, power generation, ship

building and repair, aerospace and defence, and many others.

With CLIMAX sites and factory-certified representatives covering the globe, its team is committed to delivering an outrageously good customer experience – every interaction, every time, everywhere – 24/7.

Go to [www.climaxportable.com](http://www.climaxportable.com) for more information on products. Contact Field Machine on **1300 368 368** for applications, engineering, custom design, training, start-up and commissioning, after-sale service, spare parts, equipment repair and maintenance, and rentals.

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# PERFECTLY CLEAN OIL

Triple R Filtration Australia is the leading provider of Triple R Filters and Tan-Delta oil condition sensors in the Australian market.

## Engine oil filtration

Increased demands to extend oil change-out intervals on engines has resulted in the use of synthetic oils being used on modern engines. These synthetic oils have resulted in oil change-out intervals being significantly increased, thereby reducing costs associated with oil changes. Extended oil change-out intervals have also impacted the filter used on the engine. Change-out of the filter element is in most cases associated with a change-out of the oil and the filter element has therefore had to be adapted to meet this requirement.

Filter elements have also had to adapt to other aspects of modern engines.

- Improving fuel economy
- Improving power
- Reducing emissions

Clean oil improves fuel economy and power output by reducing friction and wear on moving parts of the engine. Increased wear causes oil to enter the combustion chamber, burns with the fuel and is exhausted into atmosphere as particles and hydrocarbons.

## Full flow and by-pass filters

Filters usually installed and supplied with the engine are referred to as full flow filters. The total flow rate of the lubrication pump is directed through this filter to lu-

bricate the engine. By-pass filters are an addition to the full flow filter. A flow of oil is directed from the main oil supply into this filter to enhance filtration capability. Filter media used in by-pass filters is specifically designed to capture small particles which the full flow filter cannot.

## Soot

Soot and sludges in engine oil are formed as a by-product of incomplete combustion. When the air and fuel mixture fails to ignite completely, there is leftover particles. These particles find ways into the lubricating oil and is reflected as soot. It is very rare that the engine combusts completely, so most engines will produce soot.

Extended oil change-out intervals increase the risk of high soot build ups in the engine oil. Full flow filters installed on engine have limited ability to remove this soot as particles are too small for the filter to remove. By-pass filter however have the ability to remove this soot and sludges in oil.

## Oil change out intervals

Oil change-out intervals are almost always dictated by the engine manufacturer. These intervals are based on distance or operational hours of the engine. There is an increasing trend to further extend these intervals.

Testing of oil samples has shown that this can happen after the recommended interval has elapsed.

## Triple R by-pass filters

Triple R filter elements have unique features which make the element suitable for by-pass filters used on engine. No other filter element on market displays these unique features.

1. Engine oil enters the filter media in a radial direction. This ensures that oil is directed into the thick 114mm of depth media.
2. A 1st stage of filtration ensures that larger particles are trapped in the least compressed filter media. By doing this, element lifetime is extended.
3. In the 2nd stage, the filter media, which is now more compressed, ensures that smaller particles are being filtered out of the oil. This again ensure maximum filter lifetime.

In the 3rd stage of filtration, the filter media is compressed at maximum by means of the outer wrap, which traps all small particles in the oil.

The filter element has a very large volume of cellulose filter media contained within. This volume or area of media ensures

A variety of housings makes the Triple R filter solution suitable for any size engine. ↗



that the element is effective at removing contamination as well as ensuring extended lifetime of the element. A selection of housings makes the Triple R filter solution suitable for any size engine.

## Selection of Housings

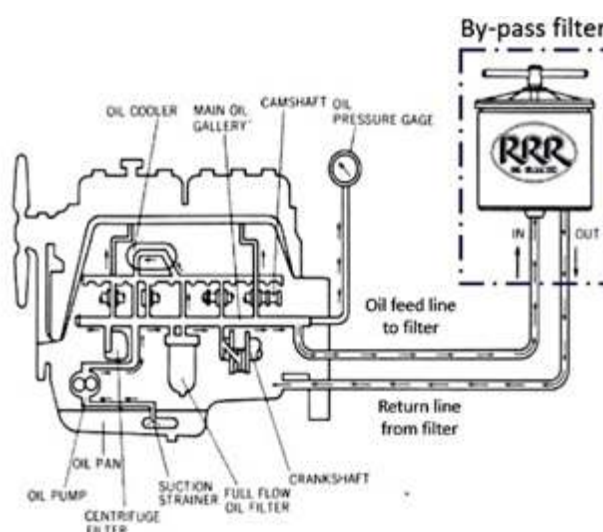
Triple R's range of mobile and fixed housings provide the perfect solution for systems in harsh and remote mining environments.

Selection of the type of filter housing is carried out quite simply by the sump size of the engine. Housings are typically available in aluminium, steel and stainless steels and range from single element housings to multiple element housings.

Housings are supplied with integrated valves needed for functioning of the filter as a by-pass filter fitted onto the engine. This makes installation hassle free with no other control valves to be installed. **AMR**



Contact us to find out more  
[www.triplerfiltration.com.au](http://www.triplerfiltration.com.au)



## THE NEXT GENERATION IN OIL FILTRATION

We specialise in providing solutions to improve oil cleanliness and condition by utilising Triple R depth elements.

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**The 3 stages of filtration** in the element ensures that the oil remains free of water, varnish, sludges and particles.

## Applications include:

- Hydraulic systems
- Lubrication oil systems for
  - › Compressors
  - › Gearboxes
- Diesel and gas driven engines
- Metal working fluids
- Heat transfer fluids

## Our solutions for your industry:

- Tailored oil impurity control advisory
- Depth cleaning filters
- Custom engineered systems
- Oil cleaning services: Varnish, Water Removal
- Real time oil sample analysis
- Filter systems mobile & stationary
- Rental/Hire fleet





2" 316 Stainless steel 'Aussie Mine Spec' pumps in production, ready for testing before heading out for a tough life in the mines.

# AUSSIE RESCUE MINE FLOOD MITIGATION

**We all realise that climate change is a reality. Weather events are more erratic, more dramatic and have more impact on everyday life as well as the possible disruption of Australia's leading industries, ie; mining and agriculture. The devastation and tragedy created in NSW at Lismore, the recent floods in North Queensland, South Australia and Victoria are testament to the need for action in terms of preparation before the next event.**

As we prepare this submission for the Mining Review Magazine we are conscious of the fact the "Big Wet" has finally started in north Australia. That means the possibility of a major impact on mining operations from Weipa in Queensland, to Groote Eylandt and further west to our massive resource of iron ore.

## DEALING WITH FLOODS

When floods are a 100 year event it is easy for Governments, Local, State and Federal to ignore the need for any serious activity. For example, the idea that you don't have to do anything about the last flood, except clean it up, with the next one 99 years away.

Those days are over!

Yet, Local Government bodies are under-

funded, unable to deal with serious flood mitigation. At both State and Federal levels, they seem oblivious to the need to react to the recent events. For example, we don't read about the NSW Government's massive plans to build levies and dikes around Lismore to protect the town from the next flood. We know the flood is coming, but it gets back to political priorities.

Yes, Politicians will look sad, be photographed in the devastation created by the flood but, still nothing much seems to happen. No dams, no levies, no side channels, no massive concrete works to prevent the next flood.

## MINES ARE DIFFERENT

Not everybody knows that mining is the backbone of Australia's economy. Our Politicians know it although they don't ever really sing the praises of the industry.

On the other hand, we know that mines are our "Big Earner" and a mine that is under water, or for that matter, isolated, becomes instantly unproductive.

One Australian pump manufacturer, Australian Pump Industries, has studied these issues and is offering both townships and mines a mobile flood mitigation program.

It takes the form of heavy duty pumps

designed for moving large volumes of dirty flood water from where it is, to where you want it to be.

**The pumps, big 6" self priming gushers will handle spherical solids up to 3 inches in diameter. They will pump 6000 lpm in terms of flow and are equipped to handle dirty water, even contaminated sewage.**

The big pumps, called Aussie MQ600TD, are powered by 80hp Deutz air cooled diesel engines and come in either skid or trailer mounted configurations.

What's so good about these pumps is their simplicity. The pump consists of one big cast iron body with a huge self priming tank built into the casting.

**It is that big tank that enables the machine to a draft water through a vertical lift of 7.6m. No priming devices are required. The pump primes itself!**

The impeller is a huge open design built to withstand abrasion and solids laden liquid. The mechanical seal is "an over the top" oil lubricated, tungsten titanium carbide configuration. Best of all there is a huge clean out port built into the front of the body that enables a choke to be cleared in a matter of minutes. In other words, it is designed for this specific application!

## SKID MOUNT 6" TRASH PUMP

This version is built on a heavy duty steel frame with a 150ltr fuel tank. That fuel tank allows the engine an 11 hour run time.

A balanced integrated lifting bar is also included in the package.

Safety Equipment including a LOFA engine control shutdown system incorporates warnings for low oil pressure, high oil temperature and even v-belt failure.

Additionally, a shock mounted control panel is also provided. It's built into a water resistant housing and includes an hour metre, ammeter, tachometer and alternator failure light.

Best of all it is all heavy duty, simple and handles a lot of water!

## MAKE IT MOBILE

Aussie Engineers have enabled the skid mount version to be promptly turned into a heavy duty site trailer configuration. That includes a robust torsion style dual axle, max load 1,600kg, and heavy duty army style drawbar.

Robust jack legs are also incorporated in the 6" trailer mount pump.



## CLEAR IT FAST .... OVER 8 MILLION LITRES PER DAY

Three of these heavy duty machines, trailer mounted can be dropped into a site by helicopter if necessary, and can pump up to 25 million litres of water every 24 hours.

That's like buying a flood mitigation system without concrete channels, dams or levies as part of the package. Of course, smart operators also take precautions and do invest in infrastructure to facilitate the movement of water fast, even with pumps like the Big Aussie Job!

## SAVING HORSHAM

It was almost 15 years now since Millers Contracting, an earthmoving contractor who uses an Aussie MQ600TD, 6000 lpm pump, just for site dewatering, saved the Victorian town of Horsham from flooding.

The Miller team moved fast and were able to pump water from the town into a side channel, providing "instant flood relief service."

More recently, 23 of these machines saved the capital city of South Sudan, Juba from flooding by redirecting the Nile River away from the city.

This was no easy task bearing in mind that two thirds of the country was underwater at the time with an unprecedented flood waters flowing from the "Al-Sudd."

Aussie air freighted six of those pumps from Sydney to Juba. In spite of the primitive operating conditions, the city was saved!

## WHY WET PRIME PUMPS WORK

Australian Pump Industries is the specialist in self priming centrifugal pumps. Although they started out with small lightweight portable fire pumps the company have expanded the range over the last 30 years and now offers these Flood Busters for contaminated water and sewage by-pass as well.

"That's our specialty," said Aussie Engineer

Chief, John Hales. "We've now had 30 years of experience of working with the mining industry. We work with drillers, open cut mines, as well as underground operations! Our big trash pumps are doing a mighty job alluvial gold mining and have proven to be super reliable and very effective," he said.

The concept is simple. Instead of having vacuum pumps or compressors attached to the pump, Aussie's self priming only need the pump to be primed through a port in the top of the pump casing.

Thus, their trash pumps in "Mine Boss" configuration are all self priming. They can be drained with a drain plug at the bottom of the casing as well, facilitating storage and of course maintenance.

Mine Boss versions are available for all of the Trash Pump range from the 2" diesel Yanmar version to the big 4" pumps and of course the big 6" MQ600TD.

## PROVEN PERFORMER

When Tonga flooded in January 2022 the Tonga Government put two MQ600TD's to work to save the island from serious flood damage. The pumps did a mighty job!

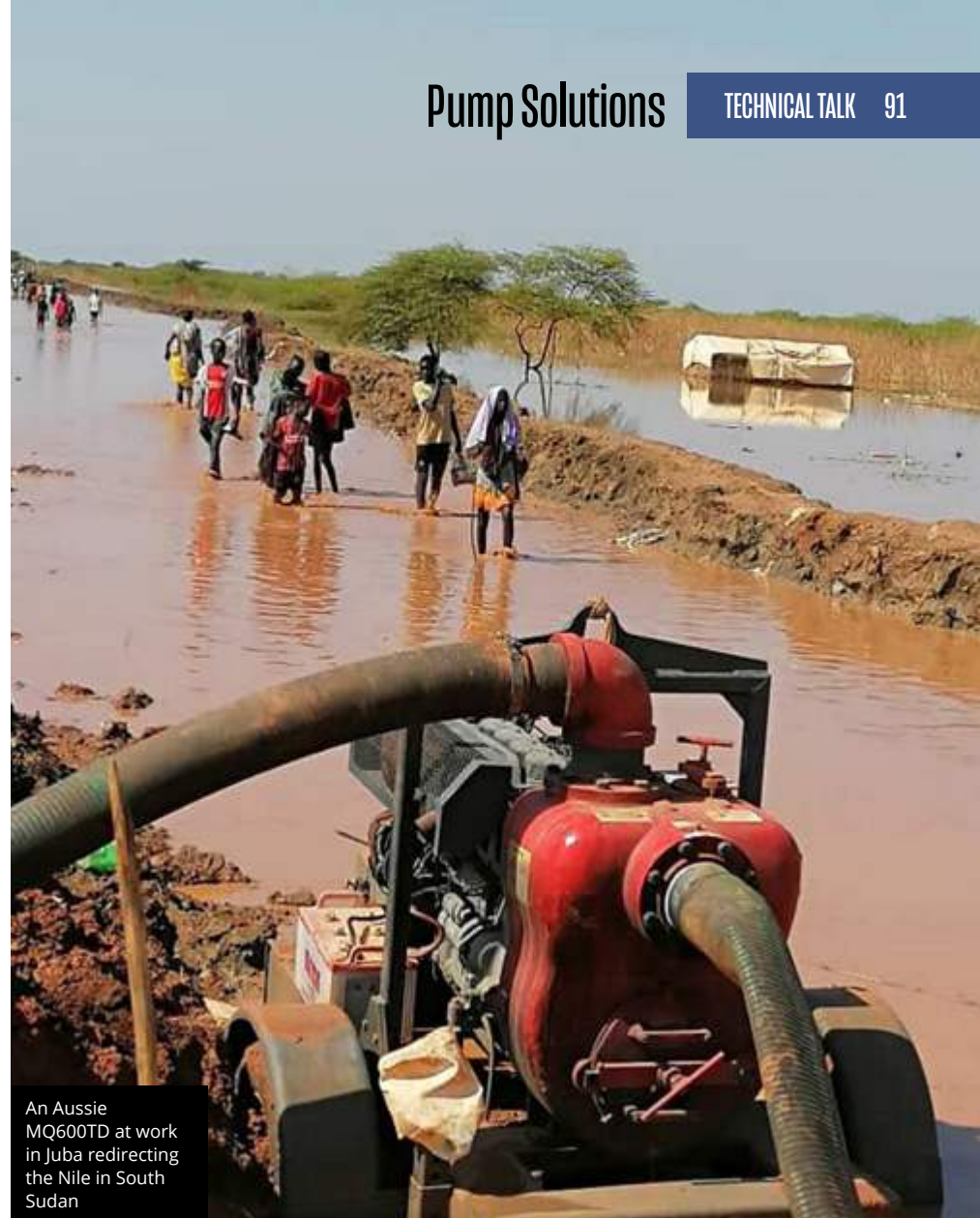
"We like self priming pumps because they're simple," said Hales. "We know designing components out of the system is a great way to reduce maintenance. The less parts there are, the less there is to go wrong," he said.

## WHAT'S NEXT?

Hales revealed the impending introduction of a new 4" heavy duty cast iron semi trash pump with a 26hp Kohler engine. The new model, still under development, is due for release in March 2024.

It will be available in Mine Boss configuration.

It is of course a self priming pump and although it has already proven itself for fast filling water carts, it will fill the gap in the market for heavy duty portable 4" trash pump for mine dewatering.



An Aussie MQ600TD at work in Juba redirecting the Nile in South Sudan

"It is a beautiful pump," said Hales. "In the heavy duty stainless steel frame and our Mine Boss configuration, it will eliminate a huge range of issues that currently beset mining companies. Yes, there'll be a cast 316 stainless steel option and it won't be ridiculously expensive," he said.

## SERVICE STATIONS & DISTRIBUTORS

"Although we have a lot of commercial service stations around Australia for small Honda and Yanmar engine drive pumps, we now know we need specialised distributors focused on the mining industry.

Australia's mining giants need to get fast service, even in remote locations," said Hales.

Interested parties should contact Australian Pump Industries Mining Department.

Further information on the complete Aussie "Mine Boss", range of Trash pumps and stainless steel pumps is available from <https://www.aussiepumps.com.au>.



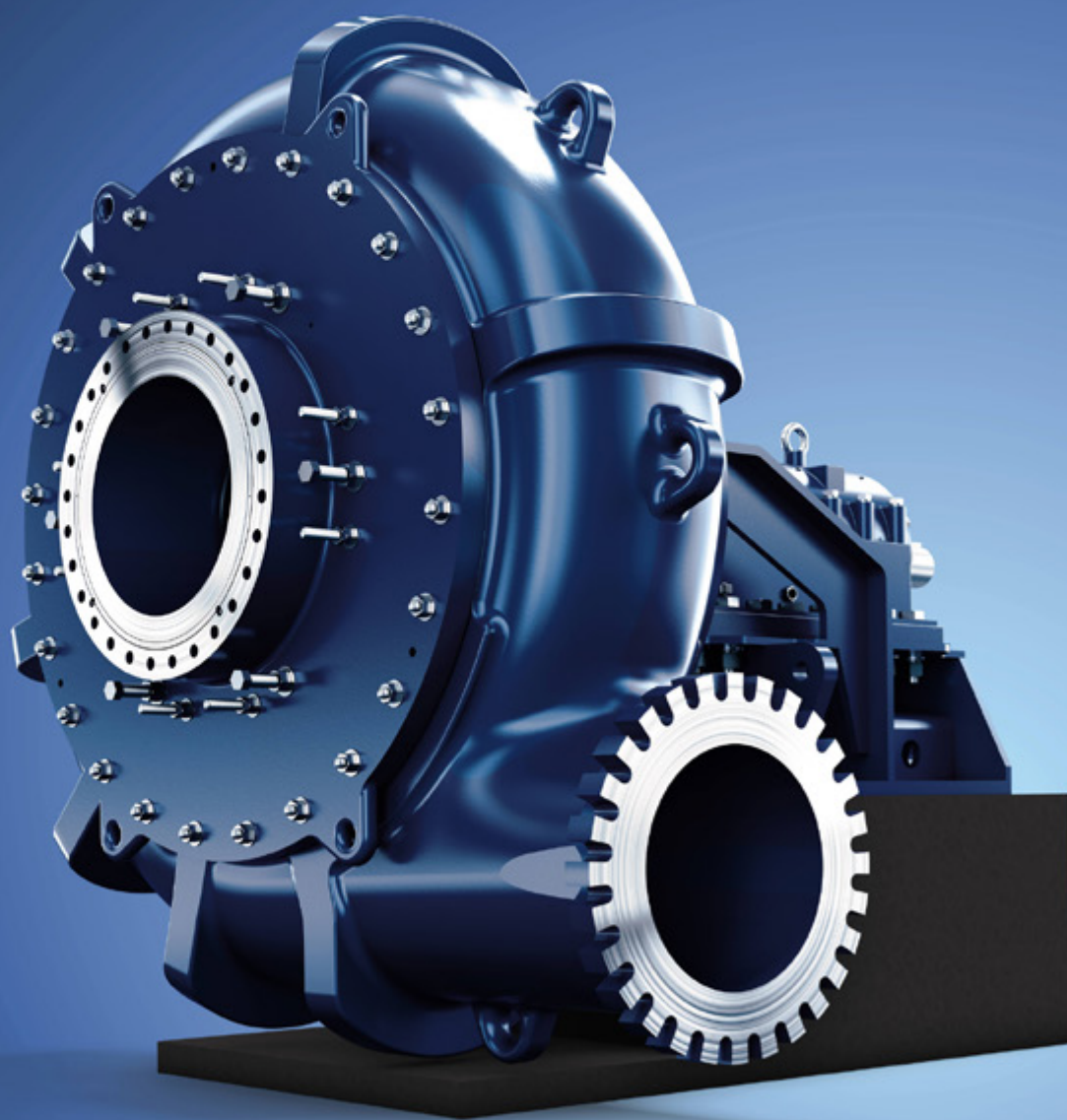
Aussie Pumps John Hales with five 6" MQ600TD's



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- The R5 Robowash machine has a 1800mm basket, an internal height of 1100mm and a weight range of 3000kg.
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