

THE AUSTRALIAN MINING REVIEW

PP100007123

Incorporating THE AUSTRALIAN ENERGY REVIEW

OCTOBER 2018

australianminingreview.com.au

A product of
Publications & Exhibitions Australia Pty Ltd

**RAMELIUS
RAMPS UP M&A
ACTIVITIES**

NEWS
p6



**PUSHING THE
BOUNDARIES**

AUGMENTED AND
VIRTUAL REALITY
FOR MINING
p33

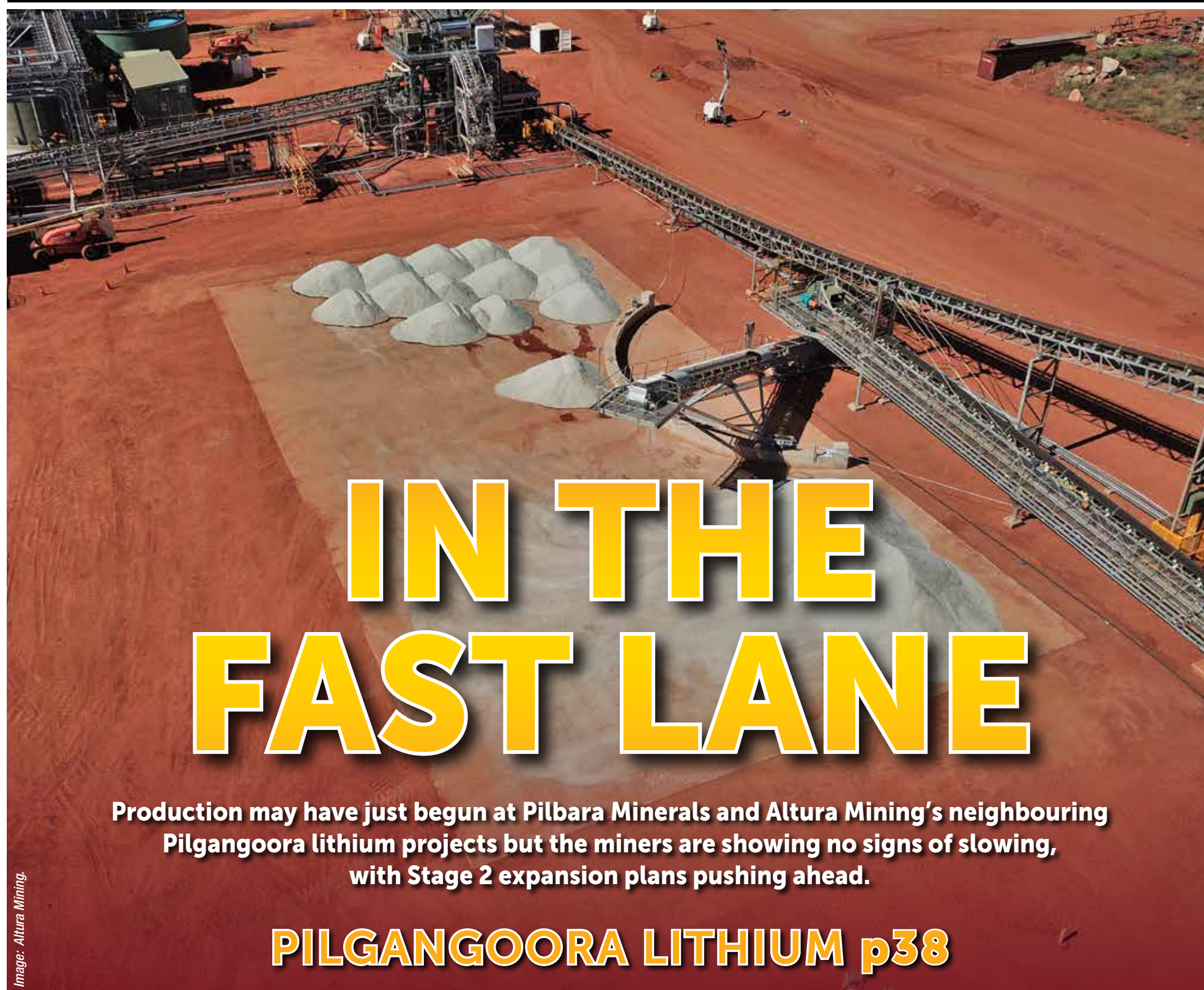


**PAUL POLI
MATSA RESOURCES**

IN THE SPOTLIGHT
p63



MAJOR COMMODITIES SNAPSHOT p4



IN THE FAST LANE

Production may have just begun at Pilbara Minerals and Altura Mining's neighbouring Pilgangoora lithium projects but the miners are showing no signs of slowing, with Stage 2 expansion plans pushing ahead.

PILGANGOORA LITHIUM p38

Image: Altura Mining.



3.5 STAR NABERS RATING

**Your new Perth
HEADQUARTERS!**
21teddington.com.au

Full details on the above website.
Areas from 214 to 1130 sqm with complete fit-outs.

What stories matter to you?



editorial@miningoilgas.com.au

NEWS

Commodities Snapshot	4
Explorers on the Move	8
The Contractors	10
Technology & Innovation	12
International	14
Commodity Focus: NdPr	16

FEATURES

Mining in the Northern Territory	18
Rio Tinto Iron Ore	23
Western Areas	30
Augmented & Virtual Reality for Mining	33
Anglo American	36
Pilgangoora Lithium	38
Dacian Gold	40
Boss Resources	42

INDUSTRY FOCUS

Companies Gearing Up	43
Air Conditioning	51
Crushing & Screening	53
Haul & Mine Road Management	54
Injection Moulding	57
Inspection & Testing	58
Instruments & Instrumentation	59
Road & Line Marking	61
UAVs & Drones	62

IN THE SPOTLIGHT:
MATSA RESOURCES
EXECUTIVE CHAIRMAN

PAUL POLI p63

BULLISH
TERRITORY

Mining in the NT p18

CENTRE
STAGE

Rio Tinto Iron Ore p23

KICKING
GOALS

Dacian Gold p40

PUBLISHED BY
ABN 28 112 572 433A product of
**Publications &
Exhibitions Australia Pty Ltd**

GENERAL MANAGER

Brad Francis

brad@miningoilgas.com.au

MANAGING EDITOR

Elizabeth Fabri

elizabeth@miningoilgas.com.au

JOURNALISTS

Amy Blom

amy@miningoilgas.com.au

Jessica Cummins

jess@miningoilgas.com.au

GRAPHIC DESIGNER

Charlotte Lufino

charlotte@miningoilgas.com.au

SALES EXECUTIVE

Penny West, Biliانا Harman

PRINTER

Rural Press

CONTACT US

P: (08) 6314 0300

F: (08) 9481 7322

160 Beaufort Street, Perth, WA 6000.

PO Box 8023, Perth BC, WA 6849.

E-mail the editor at
editorial@miningoilgas.com.au

For all other emails to staff, the standard convention is, first name (only) @miningoilgas.com.au

The Australian Mining Review is a free publication to all mine sites and mining companies in Australia. Its value is \$11 an issue. (Includes GST, postage and handling).

The copyright is vested in the Proprietors of The Australian Mining Review; neither whole nor any part of this issue may be reproduced without permission. The views expressed in this publication are not necessarily those of Miningoilgas Pty Ltd and its staff, but are those of the respective author who accepts sole responsibility and liability for them.

NOTICE TO ADVERTISERS:

The Trade Practices Act, 1974 came into force on the 1st October 1974. All advertisers and advertising agents are directed to carefully study the provisions of the Act, which contain strict regulations on advertising.

It can be an offence for anyone to engage, in trade or commerce, in conduct deemed "misleading or deceptive". Specifically s53 of the Act contains prohibitions from doing any of the following in connection with the promotion, by any means, of the supply or use of goods or services:

(a) falsely represent that goods are of a particular standard, quality, value, grade, composition, style or model or have had a particular history or particular previous use; (b) falsely represent that goods are new; (c) represent that goods or services have sponsorship, approval, performance characteristics, accessories, uses or benefits they do not have; (d) represent that the corporation has a sponsorship, approval or affiliation it does not have; (e) make a false or misleading representation with respect to the price of goods or services; (f) make a false or misleading representation concerning the need for any goods or services; or (g) make a false or misleading representation concerning the existence, exclusion or effect of any condition, warranty, guarantee, right or remedy.

PENALTIES:

For an individual — \$10,000 or six months imprisonment

For a corporation — \$50,000. It is not possible for this company to ensure that advertisements published in this newspaper comply with the Act and the responsibility must, therefore, be on the person, company or advertising agency submitting the advertising for publication. In case of doubt, consult your lawyer.

YOUR 12 MONTH HARD COPY SUBSCRIPTION TO
THE AUSTRALIAN MINING REVIEW

+ Original commentary and analysis + Interviews + News

+ In-depth company and project profiles + Cutting edge technology, products and services

Just \$120 + GST for 12 issues (Australia only)

CONTACT US TODAY ✉ brad@miningoilgas.com.au ☎ [08] 6314 0303

THE AUSTRALIAN
MINING REVIEW
miningoilgas.com.au



- Injection/Rotational/Extrusion Capabilities
- Polyurethane Specialists
- Fire Resistant Anti-Static Materials (FRAS Rated)
- Plastic Fabrication and Welding
- Urethane Wear Plates
- Customized Conveyor Skirting
- Polymer Lining. Reducing/Eliminating Product hold-up
- Sheet Sales (Acrylics/PC/HDPE etc)
- Product Prototyping
- Tooling/Mould Manufacturing Facilities

For 22 years Allmould Plastics has supplied, serviced and contributed to successful Mining and Resource Operations and their associates partners through-out Australia. With quality management systems in place we continually thrive on the fact we offer and deliver on fast turnaround times Australia Wide ensuring our clients projects are both successful and reliable.

For all your Plastic needs please contact our helpful and friendly team:

GET IN TOUCH

📍 24 Strathgrove Way, Orange, NSW 2800

🌐 www.allmouldplastics.com.au

📘 www.facebook.com/allmould/

☎ (02) 63 611 399

✉ sales@allmouldplastics.com.au

🌐 www.linkedin.com/company/allmould-plastics

TSURUMI MINING SOLUTIONS

- 316 stainless steel
- Cast iron
- Titanium
- Heads to 200m
- 1000v options
- 3 year warranty



Sold & serviced by
AUSSIE MINING PARTNERS

Aussie Pumps

Australian Pump Industries
info@aussiepumps.com.au
www.aussiepumps.com.au

Call Fiona for your nearest depot

02 8865 3500

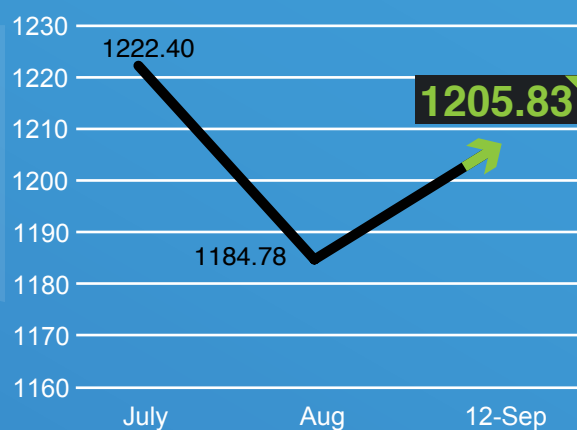
MAJOR COMMODITIES

SNAPSHOT

GOLD

\$US/oz

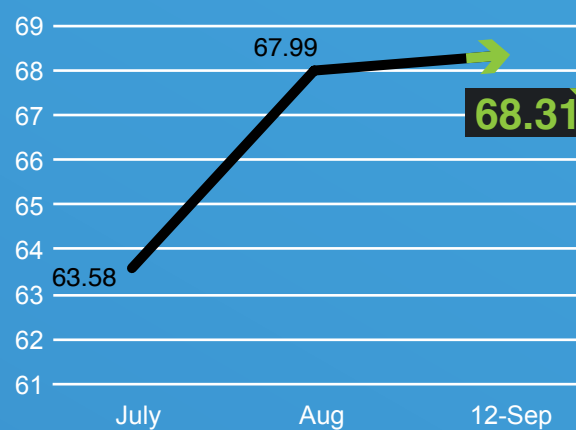
Gold prices rallied above the \$US1200 per ounce mark in September as the US dollar slipped amid escalating trade tensions.



IRON ORE

\$US/t
62% Fe CFR China

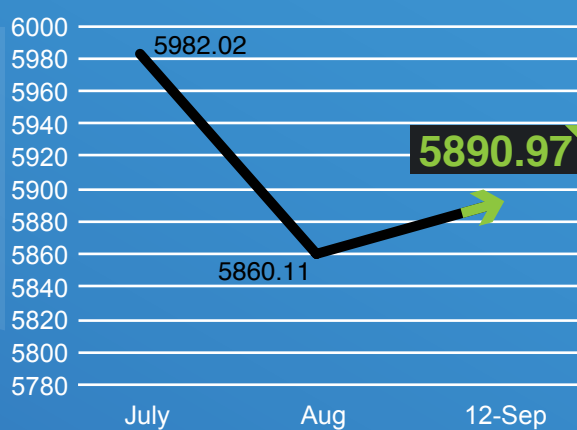
The iron ore price pushed higher through the month due to rising Sino-US trade tensions.



COPPER

\$US/t
LME Price

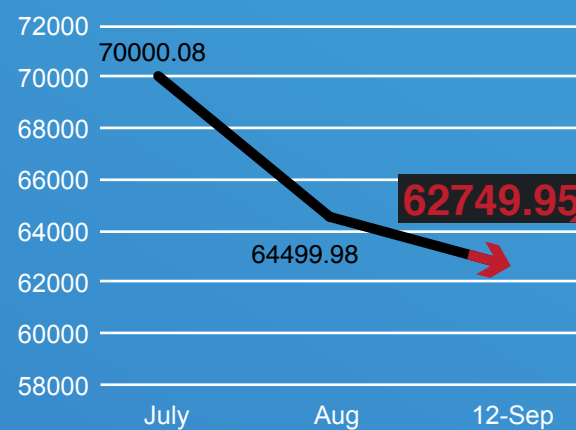
Copper prices may not have returned to June highs of \$US7330.50/t, but prices did see some recovery in September tipping over \$US6000/t.



COBALT

\$US/t
LME Price

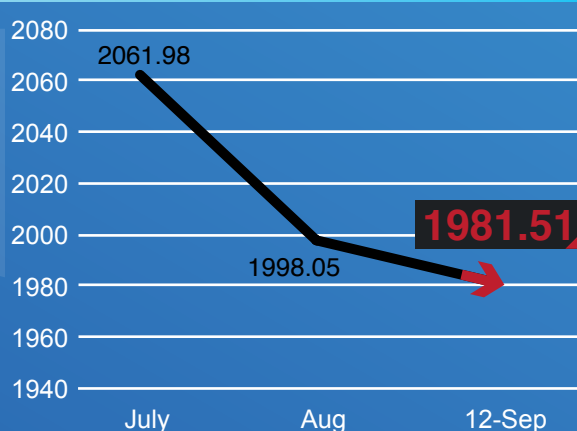
Cobalt spot prices drifted lower through September, but analysts remain optimistic that strong demand and limited supply will see it recover.



ALUMINIUM

\$US/t
LME Price

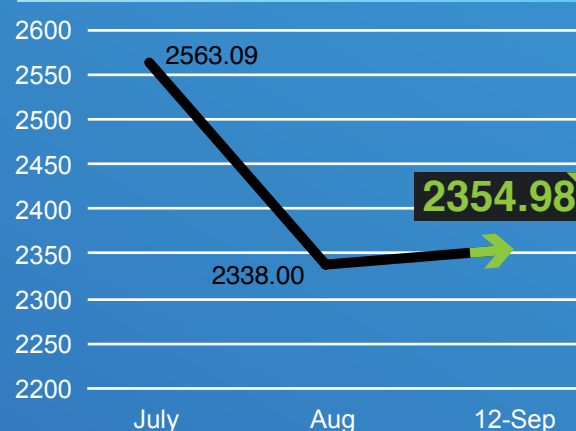
The aluminium price remained relatively flat, hovering above and below the \$US2000/t mark through September.



ZINC

\$US/t
LME Price

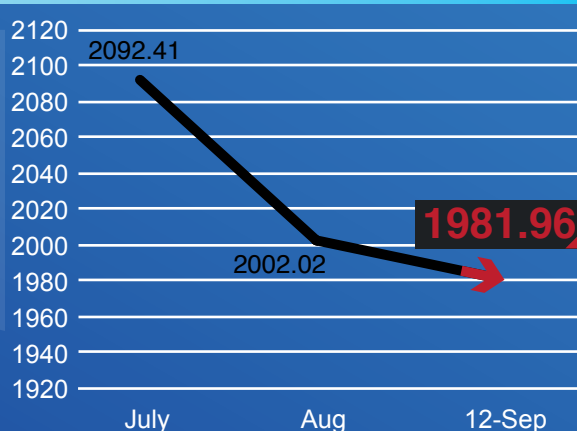
Zinc continues to be the hardest hit base metal of the year, with prices remaining flat against the backdrop of trade tensions.



LEAD

\$US/t
LME Price

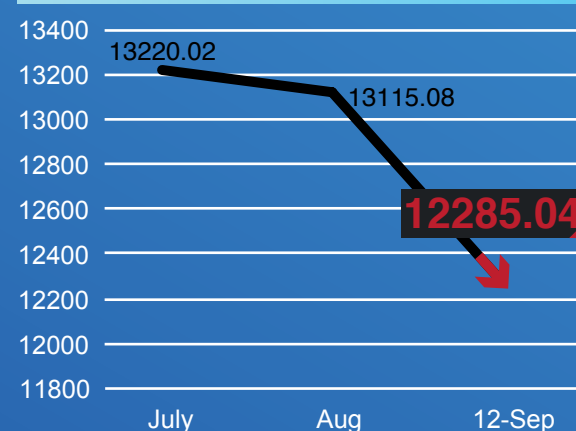
Lead is another base metal which continues to be impacted by international trade tensions, with prices swinging below \$US2000/t.



NICKEL

\$US/t
LME Price

Nickel prices sunk to eight month lows in September in line with a slide in steel prices.



ROSTA

☎ 08 9248 1588
📍 Unit 2 / 272 Camboon Road
Malaga, Western Australia 6090
✉ sales.aus@rosta.com
🌐 www.rostaaustralia.com.au



Solutions for Mining & Aggregate

Cost effective Pre-tensioning ROSTA MB Motorbases for belt drives

ROSTA Single Pivot MB Motorbases are used for maintaining belt tension on V Belt drives, such as those used on crushers, feeders, screens, fans, pumps and just about any application which utilises V belts. Sizes range from 0.75kW to more than 550kW.

ROSTA ATEX Single Pivot MB Motorbases are suitable for applications in hazardous areas according to the ATEX 94/9/EC Directive.

ROSTA Superior Lift Motorbases are used in overhead drive applications, and are especially suited to pump drives. These motorbases eliminate the often-used vertical jacking bolt system and makes belt changes safer, quicker and easier as the V belt drive alignment is maintained throughout the motor movement range. As with the company's whole MB ROSTA Motorbase range, there is a noticeable improvement in pulley and V belt life as belt tension is maintained for a longer period when compared to a fixed system.

ROSTA Oscillating Mountings offer a broad range of units including AB mounts which are used for screen and feeder suspension for fixed, modular and mobile plant applications in the mining and quarrying industries to replace coil springs, rubber block and airbag systems.



The AB mounts have proven to be reliable and long lasting, even in hostile environments which has endeared them to end users and OEMs alike.

ROSTA Anti-Vibration Mounts are used for isolation of vibration and impact from surrounding structures. These are especially useful for absorbing high impact loads on conveyor transfer point applications.



ROSTA MB 50 motorbase for Screen Drives



ROSTA MB 70 Motorbase for Screen & Crusher Drives



ROSTA MBSL 70 Motorbase for Vertical Pump



ROSTA MB 100 Motorbases for Crusher Drives



IN BRIEF

NAIF approves \$95m for Thunderbird

WA

SHEFFIELD Resources has been given a boost for its Thunderbird mineral sands project in WA's Kimberley region after the Northern Australia Infrastructure Facility (NAIF) approved a \$95 million loan.

The loan enabled Sheffield to construct on-site LNG power generation and storage facilities at Thunderbird, upgrade mine site roads, in-source mine site accommodation and facilitate the construction and revitalisation of ship loading and logistics assets within the Port of Derby in WA.

As a result of the loan, Sheffield would no longer require third party facilities, which would reduce operating costs.

Production is expected to begin in 2020.

Beyondie project a step closer

WA

KALIUM Lakes has received the green light to begin development at its Beyondie sulphate of potash project in the eastern Pilbara, WA.

Kalium managing director Brett Hazelden said the approval of the mining proposal and initial mining tenure requirements would enable early construction work activities to begin this calendar year, while the remaining approvals are processed.

The miner has also completed a Bankable Feasibility Study which confirmed production could begin in 2020.

"Kalium Lakes is proud to be the first sulphate of potash developer to complete a Bankable Feasibility Study, for an Australian deposit which allows for an initial mine life of between 30 to 50 years," Kalium Lakes stated.

Nexus acquires Newmont tenements

WA

NEXUS Minerals is set to acquire three tenements from Newmont adjacent to its Wallbrook gold project in the Eastern Goldfields, WA.

The tenement package covered about 190sqkm of prospective geological terrain, bringing Nexus' total contiguous package to about 250sqkm.

Nexus expected to acquire the package from Newmont for \$13,100 and a 2 per cent net smelter royalty on all mineral product extracted and recovered from the tenement.

The acquisition would allow Nexus to accelerate exploration across the enlarged and underexplored Wallbrook gold project.

RAMPING UP: Companies to Watch

REUBEN ADAMS
NATIONAL

GALENA (ASX:G1A)

"In my 20-years in mining and mine finance, I have rarely seen a base metal project in a top tier jurisdiction demonstrate the kind of economics as shown by the Abra Scoping Study," said incoming Galena chief executive and managing director Alex Molyneux.

The ex-Paladin boss has substantial experience in major mine development, and represents a key element in Galena's aggressive transition from explorer to major base metals producer in the next three years.

Galena's high-grade Abra lead-silver-gold project in the Gascoyne region of WA – 100km from Degussa's Sandfire operation – represents one of the world's largest undeveloped lead resources; and it just keeps getting bigger.

The June 2018 Scoping Study revealed an outstanding long life, high margin, low capex project.

This includes an initial 11 year life producing 91,000t lead and 450,000oz silver each year at full production.

Pre-production capex is estimated at \$153m, with project payback from start of production of between one and one and a half years.

Galena is currently undertaking a Pre-Feasibility Study, due for completion in September.

VENTUREX (ASX:VXR)

Venturex Resources is another company who has tapped an experienced executive



Image: Galena Mining.

Galena's Abra lead-silver-gold project represents one of the world's largest undeveloped lead resources.

to spearhead its projects through feasibility and into development and production.

Managing director Ajanth Saverimutto, who took the reins in April this year, was most recently founder and managing director of Salt Lake Mining, but has also held senior roles with Unity Mining, BHP, and Freeport-McMoRan.

Venturex' cornerstone asset is the large scale, low cost, and long life Sulphur Springs copper-zinc-silver project near Port Hedland in WA, which it is aggressively advancing towards a development decision. A Definitive Feasibility Study is pending.

In 2017 Venturex estimated a pre-tax NPV of \$338m at Sulphur Springs; but with zinc and copper prices enjoying a healthy boost since then, this economics of this project could be improved substantially.

Ramelius increases M&A activity

AMY BLOM
WA

RAMELIUS Resources has its sights set on more gold, recently launching a takeover bid for junior explorer Explaurum and inking a deal to purchase Black Oak Minerals' Marda project.

In early September, the miner launched an all scrip \$59 million takeover bid for Explaurum, which owns the Tampia project, 140km south of its Edna May gold mine in WA.

Ramelius said it attempted to engage with the Explaurum board to "jointly explore a recommended deal", but had not come to an agreement so decided to put its offer directly to shareholders.

According to Ramelius managing director Mark Zeptner, there was clear logic in the combination of Explaurum's assets with Ramelius' WA operations.

"After the successful acquisition of Edna May last year, Ramelius is focussed on building on its growth strategy to extend mine life and maximise the value of existing infrastructure in its portfolio," Mr Zeptner said.

"This compelling offer is the next step in that growth strategy and is expected to provide significant benefits to both Explaurum and Ramelius shareholders."

Explaurum hit back just days later, telling the market the Ramelius bid was "wholly inadequate", and for shareholders to "take no action".

According to Explaurum, the Ramelius offer grossly undervalued the Tampia gold



Image: Ramelius Resources.

Ramelius Resources has committed to an early 2019 start for Edna May gold mine.

project and was ill-timed.

Explaurum was expected to issue a target statement in mid-October with the directors' recommendations to shareholders.

Days later, Ramelius also signed a binding agreement to acquire Black Oak Minerals' Marda project for \$13 million, which will act as a feed source for its Edna May mine.

Mr Zeptner said the acquisition highlighted the strength of its team in identifying opportunities for incremental ore feed around its key mining hubs of Mt Magnet and Edna May.

"This has the potential for significantly enhancing future economics at the Edna May mine yet does not detract from our ability to execute strategic transactions in other

HAVILAH (ASX:HAV)

In July, diversified junior Havilah offloaded its small Portia gold mine for \$14.7m to focus on its advanced copper-cobalt-gold plays in South Australia.

And these are standout projects, boasting the largest combined copper-cobalt-gold sulphide resources in Australia, as well as the second largest copper equivalent undeveloped resources in Australia (behind OZ Minerals).

Havilah's next priority is the high-grade Mutooroo copper-cobalt deposit.

The company believes the project – which outcrops at surface, requires low start-up capex, and enjoys exploration upside – could be in production in two years.

Havilah is currently undertaking a \$5 million work program at Mutooroo that covers exploration, a Prefeasibility Study and permitting.

But the company maker is Kalkaroo, which based on a 100mt ore reserve, is the largest undeveloped open pit copper-gold-cobalt deposit in Australia on a copper equivalent ore reserve basis.

Its 23,200t cobalt resource also makes the project the largest sulphide cobalt deposit underpinned by copper in Australia.

"What sets Havilah's projects apart is that our projects work on copper alone," Havilah chief executive Walter Richards told *The Australian Mining Review* in June.

"The cobalt therefore becomes a bonus that generates significant upside, without increasing the risk of the projects."

And there's good potential for additional resources, with Kalkaroo open in every direction.

Additional Prefeasibility work to optimise project economics is due for completion by the end of the year.

jurisdictions," he said.

The acquisition news came a week before Ramelius announced it would commit to underground mining at Edna May, beginning early next year.

The miner had been considering this option versus a \$100 million cutback of the existing open pit.

Mr Zeptner said the decision to move down the underground path had not been taken lightly.

"After extensive studies and considering our future options around other potential ore sources in the area, we believe this is a prudent decision that will lead to exceptional future outcomes for our shareholders," Mr Zeptner said.

Metso Poly-Met™ mill lining - ready to take on any challenge

That's how we make the big difference, the Metso Way.

Every grinding mill is unique. They do however have one thing in common. They need to be operational. Liner changes need to happen quickly and safely. Every day we work to find new and better ways to keep mills around the world up and running. Experience from over 8,000 mills world-wide combined with the market's widest range of grinding wear parts and services means we can select exactly the right solution for your mill.

Metso Poly-Met™ is a true problem solver. The rubber in combination with steel offers low weight, easy maintenance, long and predictable wear life, as well as the elimination of cracking and pegging. This means more efficient grinding for you.

What makes your grinding mill unique? Make sure you have the right parts for the job with Metso.

Find out how Metso grinding wears and services can make the big difference for your mill at metso.com/GrindingWears
#TheMetsoWay



 **DaRa**
Switchboards

Customised Switchboard Specialist

Any Switchboard for Any Mine

We understand that every mine is unique and we match that up with tailor made heavy duty switchboards for every mining application

- Temporary Power Boards
- Distribution Boards
- Control Panels
- Main Switchboards
- Motor Control Centers

Visit us
www.electricalswitchboards.com.au

A collection of various industrial switchboards and control panels. Some are orange, some are blue, and some are white. Some are closed, while others are open, revealing internal electrical components like circuit breakers and busbars.

Four small inset images showing workers in industrial settings. The first shows a worker in a hard hat and safety vest. The second shows a worker in a hard hat and safety vest. The third shows a worker in a hard hat and safety vest. The fourth shows a worker in a hard hat and safety vest.

Send your switchboard inquiries to sales@dara-switchboards.com.au or call **1300DARASW**

IN BRIEF

Drilling resumes at Livingstone

WA

KINGSTON Resources has restarted drilling at its Livingstone gold project, near Meekatharra, WA.

The exploration program included 9000m of RC and air-core holes intended to extend and infill mineralisation identified at the Kingsley prospect during previous drilling.

The company said it was “excited to be back drilling at the project”, and expected to have first assays in October.

“The initial target, Kingsley, is located within the Livingstone’s Find area which is our biggest geochemical target,” Kingston managing director Andrew Corbett said.

“We’ve only properly tested a relatively small part of it, and it’s already generated some great results.”

Siviour DFS work progresses

SOUTH AUSTRALIA

INFILL drilling has commenced at Renascor Resources’ Siviour graphite project in South Australia as part of a Definitive Feasibility Study (DFS) underway.

The drilling program aims to expand the Mineral Resource in near-surface, high-grade zones, and produce further customer sample material.

“Concurrently with the drill program, Renascor will continue work on additional Siviour DFS work programs, including optimisation mineral process testing, detailed engineering and procurement, regulatory approvals and offtake and marketing negotiations,” the company stated.

Renascor is fully funded to completion of the DFS, which will subsequently lead to a decision to mine.

Gold nuggets found in Pilbara

WA

ARTEMIS Resources and Kairos Minerals have both discovered significant gold nuggets at their respective Purdy’s Reward and Croyden projects in the Pilbara.

On 13 September, Kairos announced 256 gold nuggets with a combined weight of 8.2 ounces had been recovered, just a few weeks into its new 2018 conglomerate exploration program.

“This is a really significant discovery, both for Kairos and for the Pilbara region,” Kairos executive chairman Terry Topping said.

Days later, Artemis also announced it had recovered 225 ounces of gold nuggets from its 47K Patch at Purdy’s Reward.

Gold rush hits Beta Hunt

AMY BLOM
WA

MAMMOTH gold specimens found at RNC’s Beta Hunt mine in the WA Goldfields could be among the largest ever discovered, with the potential to turn the miner’s fortunes around.

The Toronto-based company recently announced 9250 ounces of high-grade gold had been produced from a single cut about 500 metres underground over one week.

The high-grade gold included about 190 kilograms of specimen stone, the largest of which was 95kg with an estimated gold content of 2440oz.

A second piece came in at 63kg with an estimated gold content of 1620oz.

Early estimates from RNC have put the total yield at about \$C15 million in cash.

RNC followed up its success just two weeks later when a 43kg specimen stone estimated to contain 1100 ounces of gold was recovered from the Kambalda mine.

Geology manager at Beta Hunt mine John Vinar described the initial find as jaw dropping.

“It’s extremely rare, there’s no way to describe it – no one has seen that,” Mr Vinar said.

“The best way to describe what we saw is if you imagine someone had 100kg of gold bullion and they let it explode and then let it go underground in an amazing atomic explosion.

“It’s confined to a little patch, but just to have that sort of concentration of gold in a small tonnage of rock, it’s never been heard of.”

Mr Vinar said RNC’s Australian subsidiary, Salt Lake Mining, was incredibly lucky to have uncovered the rare find.

“Being a small company, we’re very hand to mouth, so a find of this magnitude gives us scope and hope,” Mr Vinar said.

“Now that we’ve got a bit of money we can actually start doing a bit more work and get a better understanding of the geology – that’s the most important bit.”

RNC chief executive Mark Selby described



Image: Salt Lake Mining.

A 95kg specimen stone.

it as an important discovery, which followed earlier recent discoveries highlighting the high potential at Beta Hunt.

“Just eight weeks earlier, at the end of June 2018, 1500 ounces of high-grade gold were recovered from other sediment structures on the 14 and 15 levels,” Mr Selby said.

The largest gold specimen ever recorded previously was the Welcome Stranger, which was found in Moliagul, Victoria in 1869 and had a trimmed weight of 78kg.

Final ounces from the Beta Hunt haul would be determined once the gold was processed.

While most gold from the State was usually sold to the Perth Mint, RNC was understood to be exploring other sales options to maximise the value of Beta Hunt for RNC shareholders.

RNC shares skyrocketed by 211 per cent following the announcement, reaching a peak of \$C0.28 up from \$C0.09.

Ausmex plays Trump card

REUBEN ADAMS
QLD

EXPLORER Ausmex has continued its stellar run of shallow, high-grade hits at its suite of gold-copper-cobalt assets near Cloncurry in QLD.

Follow up drilling at its Trump mining lease – a historical high-grade copper mine 50km south of Cloncurry – returned a continuous 153m mineralised intersection from surface grading 1.02 per cent copper and 1.43 grams per tonne gold, with an additional 7m zone of 1555ppm cobalt from 132m to 142m.

This included bonanza gold grades of up to 172g/t gold, including a 6m gold zone 75m to 81m from surface averaging over one ounce per tonne of gold.

Trump was originally not due for maiden drilling until mid-2018.

But in December, on the way back to Cloncurry after drilling its Answer copper prospect, Ausmex took the opportunity to complete a 16-hole scout RC drilling program at Trump.

These maiden results included 60m grading 1.3 per cent copper, and 54m grading 1.01 per cent copper; both from surface.

The company now intends to prioritise follow up drilling to establish the true thickness of the mineralisation at Trump once drilling at its nearby Mt Freda complex is completed.

The company is also concentrating efforts on producing a JORC-compliant copper-gold-cobalt resource within the target-rich Mt Freda complex over the next six months, which includes the Mt Freda gold mine (current JORC underway), Golden Mile, Drillers Hut, Canteen, and Evening Star.

These Ausmex prospects are also within trucking distance of third party primary ore processing facilities within the Cloncurry region.

“The sheer scale of the Mt Freda complex offers the potential to host a significant shallow economic mineralisation the target of the current drilling program,” Ausmex managing director Matt Morgan said.

“The company has delivered great results for shareholders in August, and with the current and planned drilling within the Mt



Named in the 1930s, very little exploration has been conducted at the historic Trump mining lease over the past 60 years.

Freda complex and The Trump mining lease, it is envisaged that additional results will continue well into the December quarter.”

Explore, collaborate,
persuade with InDepth™.



Now you can really see and share the whole picture to work smarter. InDepth™ is the ultimate way to visualise your exploration, remediation and investment. Find out more about the latest in holographic mixed reality.

www.saab.com/mixedreality

SAAB, SAAB TECHNOLOGIES, InDepth & griffen device are registered trademarks of Saab AB. All names, logos and trademarks and all related product and service names are trademarks, registered trademarks of Saab AB, licensors or joint venture partners and are the property of any of these companies.



IN BRIEF

Downer awarded contract extension

QLD

DOWNER EDI has secured a \$286 million contract extension to provide additional services at Milmeran Power Partners' Commodore open cut coal mine.

The five-year extension included operating and managing the mine, mine planning and design, drill and blast, rehabilitation and more until August 2024.

"We are delighted to be continuing this 17-year partnership," Downer chief executive Grant Fenn said.

The deal followed Downer's recent contract wins, including a \$120 million contract at the CSA mine in NSW, and \$660 million underground mining services contract at Carrapateena.

Thiess wins another Leinster contract

WA

CIMIC Group's Thiess has locked in a 24-month contract extension at BHP Nickel West's Leinster underground mine in WA.

The \$190 million contract comprised a full range of underground mining services and equipment to support the mine's lateral development, including load and haul, shotcreting, cable bolting and full fleet maintenance.

"We have a deep understanding of the mine and our team is well placed to help support its next phase of development and production," Thiess managing director Douglas Thompson said.

Thiess first commenced work at Leinster in 2016, when its team excavated 610 metres of horizontal development.

Clean TeQ awards Sunrise contract

NSW

CLEAN TeQ has selected Metallurgical Corporation of China (MCC) as a key project delivery partner for its Sunrise project in NSW.

The companies will finalise negotiations on a Front-End-Engineering and Design (FEED) contract in the coming weeks, followed by a detailed fixed price EPC contract for detailed engineering and construction of the processing plant.

"The appointment of MCC is another key milestone for the development of Clean TeQ Sunrise," CleanTeQ co-chairman Robert Friedland said.

"With MCC now engaged, Clean TeQ can continue to progress the build-up of our delivery team in preparation for the construction expected to commence in mid-2019."

MACA wins \$700m Bluff Coal contract



Image: MACA.

MACA has won a 10 year contract to operate the Bluff Coal mine.

AMY BLOM
QLD

WA-BASED contractor MACA has won a \$700 million 'life of mine' contract with Wealth Mining's Carabella Resources at the Bluff Coal project in QLD.

Under the 10-year contract, MACA will undertake open pit mining activities including planning, procurement, management and supervision, load and haul, drill and blast, and water management.

Bluff was expected to produce about 12

million tonnes of a pulverized coal injection (PCI) product, used as a raw material in steel making.

Work was expected to begin in the second quarter of the FY19, with first coal production scheduled in the third quarter of FY19.

The project would be an 'alliance' style contract and employ about 140 people.

MACA said it would finance the drop cut to first coal and other minor project works via a secured working capital facility of up to \$25 million.

The contractor will use both acquired and hired equipment with capital expenditure of

about \$45 million.

"The project will broaden MACA's commodity exposure and geographical footprint. It will also utilise larger fleet classes including 350t class excavators and 220t and 180t class dump-trucks," MACA said in a statement.

"The contract takes MACA's WIH position to \$1.982b and the company reaffirms the revenue guidance of approximately \$620m."

Last month, MACA reported a 26 per cent decline in net profit to \$23.6 million for the 2018 financial year, impacted by poor weather conditions across its WA operations.

Barminto secures Sunrise Dam extension

AMY BLOM
WA

ANGLOGOLD Ashanti Australia has awarded Barminto a five-year Sunrise Dam contract extension, worth \$700 million.

Barminto has partnered with AngloGold at the Sunrise Dam gold mine, 55km south of Laverton in WA, since the commencement of underground operations in 2003 when the first portal was cut.

Plans were now in place to increase annual production well beyond the current rate of about 3 million tonnes per annum.

Barminto chief executive Paul Muller said Barminto had worked hard to fully optimise productivity and efficiency, and deliver industry-leading safety and operational performance at Sunrise Dam.

"This contract extension speaks volumes about our commitment to AngloGold, the relationship we have built with them and the results that have been delivered at Sunrise Dam over the past 15 years," Mr Muller said.

"We are very pleased to extend our relationship and continue work to achieve our shared vision with AngloGold to further increase annual production using our latest equipment and cutting-edge technologies."

AngloGold Ashanti Australia senior vice president Michael Erickson said a culture of operational excellence had driven the mining strategy at Sunrise Dam, where the company



Image: Tony McDonough, AngloGold Ashanti Australia.

Barminto has partnered with AngloGold at the Sunrise Dam gold mine since 2003.

had targeted world-leading productivity to deliver a long-life operation with consistent cash returns.

"This contract extension demonstrates the commitment and strong working relationship that AngloGold Ashanti and Barminto have built over many years of mining challenges while continuing to significantly improve safety and productivity."

In August, Barminto ended uncertainties

about its ownership future when it announced a merger with Ausdrill, creating Australia's second largest mining services company after CIMIC.

Ausdrill and Barminto are already joint venture partners in African Underground Mining Services.

As at 18 September, shares in Anglo Ashanti were \$2.35.



NEPEAN Conveyors new standardised conveyors by ROXON

NEPEAN Conveyors now enters the market place with a new range of mobile and fixed standardised conveyors.

The ROXON range of mobile and fixed standardised conveyors means companies can rely on high quality conveyor solutions at reduced costs.

The modular conveyor equipment consists of radial and telescoping stackers, and light to medium capacity conveyors which are a perfect fit for all quarries, ports, plants mines and construction activities.

- HC100 Belt Conveyor
- HC200 Link Conveyor
- HI100 High Incline
- HS & HQ Series Fixed/Mobile Stackers
- Belt & Apron Feeders
- Loading Hoppers
- Spreading Systems
- Belt Monitoring Systems

NEPEAN Conveyors your Materials Handling Partner

Call 1800 NEPEAN or visit nepeanconveyors.com

Follow us on:



**PROK
GURTEC
ROXON**



A 1 ounce gold ingot from CSIRO's first cyanide and mercury-free gold pour.

CSIRO pours first cyanide-free gold

AMY BLOM
WA

CSIRO has produced Australia's first gold using a non-toxic chemical process in an effort to provide an alternative to extracting the metal with cyanide and mercury.

The first gold was the result of early industry trials of CSIRO's 'going for gold' technology and was produced in partnership with small gold miner Eco Minerals Research at a demonstration plant in the WA town of Menzies.

Cyanide has traditionally been used in more than 90 per cent of global gold production, but producers have faced increasingly tough regulations preventing or restricting its use due to environmental and health concerns, with numerous countries having banned its use.

CSIRO's technology replaced cyanide with thiosulphate, a non-toxic alternative, and a simple process flowsheet.

The technology could be game changing for Eco Minerals Research, which according to its managing director Paul Hanna, was aiming to become the first Australian producer to go cyanide-free.

"In close collaboration with CSIRO we've gone through the design, engineering and fabrication stages and set up a processing facility in Menzies, delivering the first gold pour in just 10 months, which is a fantastic achievement," Mr Hanna said.

CSIRO chief executive Dr Larry Marshall described the innovation as science enabling industry and environment to be partners rather than competitors.

"It has been accelerated through CSIRO's ON program, and could be a game-changer for small gold producers or those looking to get ahead of increasing market demand for greener commodities," Dr Marshall said.

"Early industry trials like this are critical to innovation and go to the heart of CSIRO's mission to tackle big, real-world challenges and unlock a better future for everyone."

A typical cyanide-based processing plant would cost about \$30 million, whereas the new technology could cost as little as \$2 million to build.

Kapunda ISR research underway



The old pit at Kapunda.

ELIZABETH FABRI
SOUTH AUSTRALIA

A GROUP of researchers and miners have joined forces in a two and a half year study that aims to identify and resolve key challenges with in-situ recovery (ISR) mineral extraction in mining.

The research program, led by Mining3 and ISR specialists Environmental Copper Recovery (ECR), will be undertaken at Terramin's Kapunda copper mine in South Australia with Thor Mining, the University of Adelaide and CSIRO.

The program would involve a "tangible demonstration of ISR mining" at Kapunda, providing examples to industry of how to unlock value in stranded assets.

Kapunda – Australia's first commercial copper mine – has been mothballed since the early 1900s, and been examined by mining companies since, which have looked to recover remaining copper on site.

Due to its close proximity to town, conventional mining techniques, have not been possible.

The proposed solution, ISR, is a mining method where metals are removed from within the ground 'in-situ' through the underground circulation of a fluid, which enables metals to be recovered from the fluid at the surface.

The ISR process has potential to be low-impact when used with suitable deposits, minimising common issues flagged by communities, such as dust and noise.

"Recent technological improvements and the use of environmentally benign lixiviants (leaching agents) are broadening the potential application of ISR mining," Mining3 stated.

"The successful development of an ISR process to extract copper and other metals from diverse geological environments will be a step change in Australian mining — but industry and communities want to know more about its value and its impacts,

specifically environmentally."

ECR managing director Leon Faulkner said the research project was made possible through a research grant from the Commonwealth Government.

Mr Faulkner said he hoped the research would broaden views on the deposit types that can be addressed via ISR, while at the same time significantly reducing mining's impact on the environment.

The research will cover community acceptance of ISR as a mining technique; mineral characterisation; lixiviant system design and optimisation; and accurate fluid flow modelling.

The University of Adelaide's Institute for Mineral and Energy Resources will also apply magnetotellurics to model and track porosity/permeability and apply its fracture network modelling techniques and resource and reserve estimation techniques to predict recoverable tonnes and grade.

Data science pilot program launched

JESSICA CUMMINS
WA

MINING innovation hub CORE has launched a new Geoscientist to Data Scientist program supporting the use of data science in the resources industry.

The program, launched in collaboration with industry peers Roy Hill, Rio Tinto, the CSIRO, ATCO, and the University of Western Australia, will address how resources leaders, geoscientists and engineers will contribute to value creation through data science.

It also aimed to help individuals ensure their skills remained relevant in the face of the fourth industrial revolution, Industry 4.0

The two part program included a one-day executive education program targeting a new type of senior leader needed to steer companies through the digital transition, and a 12-week professional program aimed at repurposing evolving skill requirements.

CORE Skills pilot lead Dr Sophie Hancock said its goal was to help groups within the industry make informed rapid decisions as technology continued to advance.



CORE Skills pilot program discussions in full swing.

"We are building a talent pool with greater data science literacy," Dr Hancock said.

"If participants think they grasped the opportunities of applying the tools the first time within the program, it is going to be an order of magnitude more powerful applying the learning in follow on projects back in their organisations."

Rio Tinto Iron Ore chief executive Chris

Salisbury said the program was a great example of how innovative learning solutions could provide people with the opportunity to grow, and enable people to upskill across a number of fields.

"Our industry is rapidly changing, and with our first 'intelligent mine' Koodaideri on the horizon, it's critically important we are able to transform data and statistics into business intelligence," Mr Salisbury said.

Mine to Mint day tour the ideal conference trip

Corporate and conference delegate tours are a speciality of Western Australia's latest day tour offering, run by leading bus transportation company Go West Tours.

The Mine to Mint Tour takes visitors on a journey of the complete gold production process, from a working mine at Newmont Australia's Boddington Gold Mine to the splendour of The Perth Mint, on Go West's latest luxury bus.

Just an hour and a half from Perth, your corporate clients and business delegates can experience the magic, allure and wonder of gold, by taking a journey to where it all begins. It's the ideal pre or post conference tour, a truly West Australian experience for visiting clients or even an employee function with a difference.

Kitted out in high visibility vests, hard hats and safety glasses, visitors will see Australia's largest operating gold mine in action and be able to look down into the giant pit, where ore is mined and haul trucks transport their loads.

The tour continues through the processing plant, where ore is ground, precious metals extracted and gold separated, ready for melting at 1100 degrees celsius and poured into moulds.

From there it's on to lunch in the picturesque Boddington township and gold panning by the



Hotham River, before departing for the drive to The Perth Mint.

The Mint is where Western Australia's golden heritage comes to life. Watch molten gold being poured to form a gleaming gold bar, see the largest gold coin in the world and the second biggest natural nugget in existence.

Then view precious coins and medallions being

minted, handle a real gold bar and experience the spectacular jewellery at The Perth Mint Shop.

Finish your tour with the ultimate corporate, catered function at The Perth Mint and choose personalised mementos of your visit, not included in the tour cost and by arrangement.

To book a Mine to Mint Tour contact Go West Tours on 9353 3671 or visit gowesttours.com.au.

MINE TO
MINT
DAY TOUR

**EXPERIENCE THE MAGIC,
ALLURE AND WONDER OF
GOLD**

**VISIT AUSTRALIA'S LARGEST OPERATING GOLD MINE
& AUSTRALIA'S OLDEST OPERATING MINT**



- VISIT THE GIANT PIT LOOKOUT AT NEWMONT'S BODDINGTON GOLD MINE
- WATCH ORE PROCESSING
- PAN FOR GOLD
- SEE A GOLD POUR AT THE PERTH MINT
- HANDLE A REAL GOLD BAR
- VIEW THE WORLD'S LARGEST GOLD COIN
- SHOP IN THE PERTH MINT'S GLITTERING SHOWROOMS

**TOURS
DEPART
DAILY**

TO BOOK CALL: (08) 9353 3671
www.gowesttours.com.au

Green shoots for South Africa industry

JESSICA CUMMINS
SOUTH AFRICA

SOUTH Africa's mining industry could attract more than \$11 billion in new investments over the next four years, according to Minerals Council South Africa chief executive Roger Baxter.

Speaking at day two of the *2018 Africa Down Under Conference* in Perth, Mr Baxter said while the country had struggled in the past decade, key findings from a recent report signalled a much stronger outlook for industry.

He said the nation's mining industry had "been through a tough patch" attracting just 1 per cent of total global exploration expenditure in 2017 compared to 14 per cent for Australia.

"Of the South African exploration allocation, only 10 per cent of that was on greenfields activity – meaning a much weaker and limited pipeline of new mining projects being developed," Mr Baxter said.

Mr Baxter said most companies had held back investment due to the nation's uncertain regulatory environment.

But times were changing, with reforms enacted this year showing green shoots for industry, and potential to see mining investment double over the next four years.

"The current mining capex for the next four years for South Africa is R145 billion," Mr Baxter said.

"Potential new capital expenditure under a more certain and conducive environment would add a further R122 billion (\$11 billion plus) to this outcome.

"This is 84 per cent higher than current commitments.



Minerals Council South Africa chief executive Roger Baxter.

"If South Africa gets back into the top 25 per cent of favoured mining investment destinations globally, this would create a further 200,000 jobs."

There were currently 117 ASX-listed companies with projects across 29 African nations, including South African-focused miners South32, Orion Minerals, West Wits Mining and Stonewall Resources.

Delecta to purchase Nevada cobalt mine

AMY BLOM
US

DELECTA has entered into a binding option agreement to acquire a 100 per cent interest in the high-grade Highline cobalt-copper project in Nevada in the US.

The acquisition formed part of the ASX junior's diversification strategy aimed at capitalising on the demand for battery minerals including cobalt, lithium and vanadium.

Delecta managing director Malcolm Day said the company continued to seek and evaluate other investment opportunities in the battery minerals space given its previous success with its investment in European Lithium.

"The increased demand for battery minerals, like lithium and cobalt, is primarily due to the rapid advancement and demand for electric vehicles," Mr Day said.

"Given the Highline mine's previous mining and exploration was circa 100 years ago, the company believes that the Highline Cobalt-copper project represents a relatively low risk opportunity in an area of known mineralisation."

Northern Star acquires Pogo

AMY BLOM
US

PERTH-based miner Northern Star has announced it will acquire the 4.1 million ounce Pogo gold mine in Alaska for \$347 million.

Pogo, a joint venture between Japanese firms Sumitomo Metal Mining and Sumitomo Corporation, began operations in Alaska in 2006 and has a long track record of producing about 300,000oz per year.

As a result of the deal, Northern Star has increased its FY19 guidance to between 850,000 ounces and 900,000oz, up from between 600,000oz and 640,000oz.

Northern Star executive chairman Bill Beament described the acquisition as an "outstanding opportunity", with potential to grow Pogo's resources and reserves, mine life, production and cashflow.

"All the metrics of this acquisition are enviable," Mr Beament said.

"The price, at \$US63 per ounce, creates an opportunity to generate substantial value.

"We will also invest in growing the resources and reserves, as we have done at our Tier-1 projects in Western Australia, with a particular focus on upgrading it to JORC-2012 status."

Investors shared the optimism, with Northern Star's shares surging by 19.54 per cent to a record high of \$8.32 in the week following the announcement, reaching a peak on 5 September.

Northern Star said the Tier 1 project had several key parallels with its Jundee



Image: Northern Star.

Dry stack tailings at Pogo.

acquisition, and the Pogo due diligence team was the same team which conducted due diligence at Jundee four years ago.

"Globally, there are 17 mines that produce more than 300,000oz a year in the Tier-1 jurisdictions of Australia, US and Canada," he said.

"Pogo, along with our Jundee and Kalgoorlie operations, gives Northern Star the potential to have three mines in that exclusive club in the coming years.

"Pogo is also an absolutely perfect project for Northern Star to apply its highly-successful recipe of investment in extensive exploration and development, which in turn drives increases in resources and reserves, mine life and free cashflow."

The acquisition was funded through a combination of existing cash reserves and a \$175 million capital raising by way of a fully underwritten placement.

The transaction was expected to be completed by October this year.

OLD AGE **VALUES,** NEW AGE **TECHNOLOGIES**

OUR SERVICES

- Field Service and Workshop repairs
- Workshop pre-assembly and installations
- Work teams for small expansion projects
- Thermal Imaging of Rotating components, Electrical components and switchboard, Piping and Valves
- Vibration analysis
- Laser alignment – Shaft, Bore and Geometric
- Non-Destructive Testing (Crack Detection) via Magnetic Particle Testing and Eddy Current Array
- Crusher rebuilds and installs
- Mill Installs and maintenance
- Line boring, Bore welding, Bore facing and alignment

cmitech.com.au

GET IN
TOUCH

Zeb Ogilvie
Managing Director, Australia & Global
☎ +61 407 888 098
✉ zeb.ogilvie@cmitech.com.au

Garry Shipard
Services Manager, West Africa
☎ +61 447 373 592
✉ garry.shipard@cmitech.com.au

Taylor Lockhead (Onsite Machining)
WA Area Manager, Australia
☎ +61 448 844 274
✉ taylor.lockhead@cmitech.com.au



CMI
TECHNICAL SERVICES

BKT and Tradefaire partners with BBL

NATIONAL

INDIAN multinational Balkrishna Industries (BKT) has become the first sub-continent group to partner with the KFC Big Bash League (BBL), signing on for three years as the new Off-Highway tyre supplier.

BKT tyres have been in Australia through its Australian distributor Tradefaire for almost a decade, providing large scale tyres to farmers and the mining sector.

As part of the announcement, BKT and Tradefaire handed over cheques totalling \$30,000 to provide support to Australian charities, particularly the struggling farming community.

A \$20,000 cheque was given to Aussie Helpers, which is based in Charleville in remote QLD and assists struggling farmers, and \$10,000 to Ronald McDonald House in Tamworth.

The partnership announcement was held at the home of Australian cricket, the MCG, and attended by Australian cricket great Ricky Ponting, executives from BKT in India including its joint managing director Rajiv Poddar, Cricket Australia head of BBL Kim McConnie, and India's acting counsel general in Melbourne.

High-profile Indian actress, fashion designer and television presenter Mandira Bedi hosted the event.

BKT's decision to partner with the BBL was motivated by the group's passion and enthusiasm for cricket and the BBL's alignment to BKT's 'Growing Together' philosophy.



Tradefaire and BKT donated a total of \$30,000 to Australian charities.

Specifically in this case, the philosophy meant supporting and sustaining cricket in Australia in order to see talent grow and attract attention for the competition on an international level – not least of all thanks to BKT's presence in 160 countries globally.

BKT's Mr Poddar, an ardent cricket fan, said he was glad about the partnership since cricket had always been his great passion.

"Not only do we appreciate its dynamics, but also the team play and above all the spirit of the game ruling this sport, or else the unwritten fair play every player adheres to," Mr Poddar said.

"On the contrary, unfair play means a

damage for the game itself.

"Here in BKT, we have the same philosophy – to do our best paying full respect to everybody."

BBL's Ms McConnie said BBL was excited to be welcoming BKT as a partner of the KFC Big Bash League as it drew closer to the highly anticipated BBL 08 season.

"BKT's decision to come on board as a supplier of the BBL shows the growing appeal of the competition not just in Australia, but overseas as well, and also demonstrates the value partners see in being associated with Australia's most exciting sporting league," Ms McConnie said.

Tradefaire general manager Steve Ryan said the agreement was invaluable and unprecedented.

"Australia's passion for cricket is timeless," Mr Ryan said.

"During summer all parks become crowded with children and teenagers playing cricket while enthusiastic parents keep up with the game from the sidelines.

"Standing by the KFC Big Bash League, being associated to both its name and activities as well as benefitting from the high levels of media attention, especially on TV, will certainly make the brand awareness of BKT in Australia fly high."

ASX PLAYERS

Alkane Resources

NSW

ALKANE Resources' (ASX: ALK) construction-ready Dubbo project in central western NSW contains rare earth elements such as NdPr.

All State and Federal approvals are in place, and the company continues to work towards securing finance.

Arafura Resources

NT

ARAFURA Resources (ASX: ARU) is developing the \$700 million Nolans NdPr deposit, north of Alice Springs in the NT.

The company is progressing a Definitive Feasibility Study which will be complete by December and aims to enter production in 2022.

Hastings Technology

WA

HASTINGS Technology Metals (ASX: HAS) owns the Yangibana NdPr project in the Gascoyne region, WA.

A Definitive Feasibility Study was completed in 2017, and this year an early works program began.

The company has signed four Memorandum of Understanding offtake agreements, comprising 70 per cent of production.

Lynas Corporation

WA

LYNAS Corp (ASX: LYC) is the only miner and processor of rare earth materials outside China and the second largest producer of NdPr in the world.

The company operates the Mt Weld mine near Laverton, WA, and has a processing operation in Malaysia.

Peak Resources

TANZANIA

PERTH-based Peak Resources (ASX: PEK) acquired the Ngualla rare earths deposit in Tanzania in 2012.

The company completed a Pre-feasibility Study and Bankable Feasibility Study in 2017, and this year received planning permission for its UK refinery.

Peak Resources is now waiting to secure a mining license, and lock in financing.

Rift Valley

ANGOLA

RIFT Valley Resources (ASX: RVY) has plans to develop the Longonjo NdPr project in Angola, West Africa.

The project is early-stage but is close to existing infrastructure, including a national highway and rail line.

Recent exploration confirmed extensive new areas of high-grade NdPr mineralisation.

Image: Arafura Resources.

MAGNETIC APPEAL

Neodymium and praseodymium – or NdPr for short – has been labelled one of the “biggest blind spots of today’s global commodity market”, but interest is beginning to pick up for rare earth elements with analysts forecasting strong demand to come out of China in the early 2020s.

Groundwater drilling at the Nolans NdPr project in the Northern Territory.

ELIZABETH FABRI

IT’S in our mobile phones, the hard disc drive of our laptops and the NdFeB magnets in the electric vehicles soon to be hitting our roads – yet there is still a level of restraint within the investment community towards NdPr.

To date, China has been the biggest producer of the rare earths material.

But an emerging group of ASX-players were now getting attention, as the NdPr price increased on the back of the fast-growing electric vehicle sector.

ASX-listed Lynas Corporation, which owns and operates the Mt Weld mine right here in Australia, is one miner in the spotlight.

The only producer and processor of rare earths currently outside of China, Lynas produced 1447 tonnes of NdPr in the June quarter.

Lynas chief executive Amanda Lacaze said the miner’s previous debt situation meant it needed to sell all of its NdPr product for cash immediately, but recent market dynamics enabled the company to hold back 100 tonnes of inventory “rather than sell at current prices”.

Arafura Resources and Peak Resources – currently seeking finance to develop their respective Nolans and Ngualla projects – also had their name up in lights.

In 2017, Peak Resources Sales, Marketing and Business Development general manager Michael Prassas published a white paper titled ‘Ndpr the biggest blind spot in the global commodity market’ which aimed to educate potential investors about NdPr, exploring the fundamentals of the market and the company’s outlook.

Mr Prassas said he was bullish on the market for NdPr over the mid-term.

“I believe NdPr is the biggest blind spot

in the global commodity market and that the next decade will provide all the evidence to support this assumption,” Mr Prassas told *The Australian Mining Review*.

“During 2017 China allocated billions of USD to NdPr relevant applications and their related infrastructure and applications, such as, industrial parks, wind farms, high speed magnet trains and electric vehicle development.

“Many people are unaware that nine out of 10 mobility applications that use a lithium-cobalt-graphite battery are also using an NdPr permanent magnet motor.

“With each of these motors representing a minimum incremental demand of 1kg NdPr oxide, the math speaks for itself.”

Mr Prassas said he expected that by 2020 the market would see a very different rare earth pricing landscape than today.

“By 2025 all car manufacturers will have a comprehensive and complete new energy vehicle range in the market, equivalent to the diversification of the internal combustion engine product portfolio today,” he said.

“At that time I anticipate that the electric vehicle segment will represent 15-25 per cent of the global annual passenger car sales, equating to approximately 15-25 million electric vehicles sold every year.

“These projections are also supported by the data which I continuously collect from the lithium sector as well as the tracked overall communicated installed industrial lithium battery manufacturing capacity.”

Arafura Resources managing director Gavin Lockyer said he was of the view China’s domestic NdPr consumption would increase by more than 30 per cent in the next five years as it pursued clean energy objectives and global leadership in electric vehicle manufacturing.

“China has been the dominant producer of NdPr but analysts have recently begun

predicting that the country will become a net importer as soon as the early 2020s as it cracks down on illegal mining and closes unsustainable operations,” Mr Lockyer said.

“Adding to the picture, US legislators last month passed the John S. McCain National Defense Authorization Act into law as part of a wider initiative to reduce the country’s reliance on foreign-sourced critical minerals and materials.

“Section 871 of the bill prevents the purchase of rare earth magnets from prohibited countries including China by the Department of Defense.

“This move is widely regarded as a boost to magnet producers outside of China and advanced stage NdPr development companies, with the potential to support higher NdPr prices as the market adjusts to a possible shortfall in sanctioned magnet production.”

Mr Lockyer said Nolans had been Arafura’s primary focus since it listed on the ASX back in 2003.

“From those very early days, the focus on rare earths, and in particular NdPr, was driven by the belief that those materials would become critical to developing technology, which is exactly what has transpired,” Mr Lockyer said.

“Key challenges for Arafura as an emerging supplier of NdPr include educating the market on the role of rare earth magnets in electric vehicle manufacture and a range of other technological applications and attracting sufficient capital to bring the Nolans Project into operation.

“As Australia’s only current rare earths producer, Lynas Corporation, has found, developing a rare earths project can be a capital-intensive process.

“For this reason, it is difficult to see a major supply response materialising as the market moves into shortfall in the 2020s.”

An abstract painting of a mountain landscape. The background is a dense, textured composition of dark brown, red, and orange tones, suggesting rugged terrain. Overlaid on this are intricate, swirling lines in shades of teal, blue, and white, which represent topographic contour lines or perhaps aerial imagery of a mine. The overall effect is one of depth and complexity, mirroring the 'bottom line' mentioned in the text.

See your bottom line from above

Open-cut mining operations require micro and macro inspection, surveillance and analysis. Insitu uses aerial remote sensing to plan, collect, analyze and distribute critical information to mine operators to improve mine efficiency and safety, while avoiding any disruption in operations. Partnering with us won't just change how you see your business. It will change how you do it.

insitu.com

 **INSITU**
A Boeing Company

SPECIAL FEATURES

MINING IN THE NORTHERN TERRITORY

BULLISH
TERRITORY

The Northern Territory's mining sector is looking stronger, with a string of new mine openings, rising exploration and improved commodity prices signalling renewed confidence.

Image: Glencore.

Glencore's McArthur River mine is set to continue growing after the NT Environmental Protection Agency recommended an expansion proceed in August.

"Actually seeing those projects come to fruition is really something that people have been disappointed on before, so the expectations can't be raised unduly until the projects are more progressed."

Chamber of
Commerce
NORTHERN TERRITORY

Image: Chamber of Commerce Northern Territory.

Northern Territory Chamber of Commerce chief executive Greg Bicknell.

AMY BLOM

MINING in the Northern Territory is experiencing a revival, but as the State Government spruiks the sector, industry figures are offering more cautious optimism.

In the past month, the Government has announced a surge in mineral exploration expenditure and record-breaking mineral production for the Territory.

In September, Northern Territory Primary Industry and Resources minister Ken Vowles told the *Mining in the Territory* conference that there were a number of new mining projects across the Territory actively and successfully progressing through the approvals process and seven mining projects with major project status.

He said the seven mines with major project status, including five proposed mines in central Australia, had the potential to deliver up to \$5.7 billion in capital expenditure, 3000 jobs during construction and 2000 jobs during operations.

Northern Territory Chamber of Commerce chief executive Greg Bicknell said while the news was welcome, he still harboured some concerns.

"I think realistically people have heard of a lot of these projects for quite some time and while they welcome the news of the exploration, we've had plenty of exploration before," Mr Bicknell said.

(CONTINUED ON PAGE 20)

Leaders in commercial refrigeration

NATIONAL

FOR more than 50 years, US company Manitowoc Ice has developed and manufactured quality ice machines for purchase around the world.

The brand of choice for many well-respected Australian companies, Manitowoc's ice machine technology is renowned for its ability to work in harsh and exposed environments.

AJ Baker & Sons is the exclusive Australian distributor of Manitowoc ice machines, and has sold them since 1976.

It is a family owned company based in Perth, with branches in Brisbane, Sydney, Melbourne, Adelaide, and Bunbury.

As a market leader, it has been involved in the commercial refrigeration industry in Australia since 1931.

The reliable and durable Manitowoc ice machines feature a strong aesthetic and cutting edge ice-making technology.

Stainless steel and galvanised panels make the machines easy to use and clean, with excellent corrosion resistance.

Manitowoc has a suitable model for every area of Australia's mining industry, with machines capable of producing up to 1300kg of ice per day.

Manitowoc has the renowned LuminIce Growth Inhibitor, which reduces yeast and other bacteria growth to provide a cleaner food zone.

Ice is food, and cleanliness is paramount in ice machines.

The AJ Baker team is committed to providing products that not only satisfy customer needs but also add value to the equipment investment, working to effectively reduce costs and increase energy efficiency.



Manitowoc ice machines are one of the most reliable and durable on the market.



The Perfectly Iced Package

Introducing Kloppenberg's new DISP IND automated ice AND water dispenser coupled with Manitowoc's Indigo® or M-Series ice machine: The hygienic one-stop solution for your ice and water dispensing needs.

Suitable for:

- Mine sites
- Construction sites
- Health services industry
- Hospitality industry



The Kloppenberg Advantage



1800 ICE MAN
423 626
www.ajbaker.com.au



Image: Northern Territory Government.

(CONTINUED FROM PAGE 18)

Northern Territory Primary Industry and Resources minister Ken Vowles speaks at Mining in the Territory conference.

“Actually seeing those projects come to fruition is really something that people have been disappointed on before, so the expectations can’t be raised unduly until the projects are more progressed.”

“Some of these mines have been in the pipeline for a decade or more and feedback that we’ve had from some of the proponents is that the approvals process is quite slow compared to some of the other jurisdictions around the country, so that is a concern for us that this is happening.”

Previous Roadblocks

Mr Bicknell said while some of the previous issues that had stymied progress had been lengthy approval processes, miners had also faced logistical issues which had placed pressure on their operations.

“The Adelaide to Darwin railway opened up several new mining provinces, but getting stuff out of the ground and onto the rail can still be problematic,” Mr Bicknell said.

“There are a couple of iron ore deposits just south of Katherine that were mined while the iron ore prices was substantially higher than it is now and they had logistical problems.

“One mine put in an ore road down to the gulf of Carpentaria, which was probably a couple of hundred kilometres, and they ran into difficulties around the approvals at the time the iron ore prices started to fall through the floor.”

Mr Bicknell said the Frances Creek mine was yet another operation that had struggled with the high cost of moving iron ore from the Territory, which had left the

company vulnerable when iron ore prices began to plunge.

Frances Creek mine went into care and maintenance mode in 2014.

Mr Bicknell said remote locations, limited resources, low labour supply and the NT Government’s reluctance to support fly-in fly-out operations had also been contributors to previous slow growth in the mining sector.

A Reinvigorated Sector

Despite his reservations, Mr Bicknell said the mining sector in the Territory was picking up.

“Commodity prices are starting to rebound,” Mr Bicknell said.

“WA’s mining sector was starting to rebound quite strongly and we’re along the same path, although a little slower than WA.”

According to the Northern Territory Government, the 2017/18 financial year was a record-breaker for the value of mineral production in the NT.

The figures were driven by substantial increases in production and the expansion of some Territory mines, as well as good market prices for many of the resources found in the NT.

Data showed the value of mineral production in the Territory for 2017/18 financial year totalled \$4.49 billion, representing a 24 per cent increase on last year, which was also a record at \$3.63 billion.

The figures included a 30 per cent increase in bauxite production to a record

12 million tonnes, a 24 per cent increase in gold production to 600,000 ounces, and increases in zinc and manganese production of more than 15 per cent.

Mineral exploration expenditure increased by 43 per cent in the NT during the same period, well above the national average.

Australian Bureau of Statistics data showed exploration expenditure in the 2017/18 financial year totalled \$111.8 million.

Exploration expenditure Australia-wide increased by 26 per cent.

Much of this exploration expenditure was in greenfields areas, with more than 50 per cent of all exploration expenditure in the Territory taking places in areas away from known deposits.

In another sign of growing confidence in the NT’s mining sector, Newmont Mining has formed a joint venture with Nova Minerals to develop the Officer Hill gold project near Tanami.

PNX Metals was looking to develop its Hayes Creek multi-metal project next year.

A number of existing operations such as Bootu Creek mine, 110km north of Tennant Creek, have also restarted recently.

OM Manganese was placed in voluntary administration and its Bootu Creek mine was suspended in December 2015 following a drop in manganese prices.

However, OM Manganese revived Bootu Creek in February this year and reported more than 200,000 tonnes of ore had been exported within its first six months.

It was an operation Mr Bicknell believed was ‘very welcome’ in the Northern

Territory.

Edna Beryl was reopened last year, becoming the Northern Territory’s first new gold mine in more than a decade.

The Territory was also set to join the growing lithium market with Core Exploration releasing a pre-feasibility study on its Finnis project near Darwin in the June quarter of this year.

It was a major step forward in the company’s goal to become a major Australian lithium producer.

Core Exploration expected to transition from explorer to producer by the end of next year.

Other emerging projects included TNG’s Mount Peake mine, which was currently seeking finance; Arafura Resources’ Nolans NdPr deposit; and Thor Mining’s Molyhil tungsten project, which is scheduled to enter production in early 2020.

Research from Seek in August has also shown employment was matching other growth areas in the sector, with job advertisements in the mining, resources and energy sector up by 34 per cent year-on-year.

The Road Ahead

The Territory Government hoped to continue this growth through its \$26 million Resourcing the Territory initiative, announced in May.

It replaced the \$23.8 million Creating Opportunities for Resource Exploration initiative, which was rolled out over four years between 2014 and 2018.

(CONTINUED ON PAGE 22)

Australia's transportable building provider



More information can be found at www.ntlink.com.au.

NATIONAL

FAMILY-owned and operated since 1983, NT Link specialises in design, manufacturing, transportation and installation of modular transportable buildings throughout Northern and remote Australia.

Covering a full range of transportable buildings from single dwelling housing projects to large camp facilities, NT Link provides everything from project management to turnkey solutions and high level customer satisfaction.

Previous camp projects include a 400 person camp on Christmas Island; 140 person camp at Red October mine; a 250

person camp in Cue, WA; a 800 person camp out of Darwin; and a 200 person camp at the Talooka gas plant on the East coast.

Other projects include the installation of over 200 offices, lunchroom and site facilities for the Ichthys LNG project at Bladin Point in Darwin.

With more than 30 years' experience, NT Link is committed to delivering quality

in a productive, safe and healthy working environment for all employees, contractors, customers and visitors.

NT Link is an ISO 9001:2015 certified builder and manufacturer, its HSEQ Management system is certified to AS/NZS 4801:2001 and its Environmental Management system is certified to ISO 14001:2015.



Camp Solutions

NT Link provides high quality temporary and permanent transportable building solutions throughout Northern and remote Australia. We specialise in providing building industry solutions from small to large commercial and industrial projects.

Our turnkey camp solutions are customised to meet the requirements of our client's project. Our building rental fleet has in excess of 1,200 buildings; we have a purpose built manufacturing facility in Darwin and an extensive plant & equipment fleet to handle all transport and installation.

Not only can we provide all the buildings and facilities required for a large accommodation camp but we are able to provide relevant services to ensure a fully operational camp. Our strong and experienced team based in both Darwin and Alice Springs work closely with our clients to deliver complete turnkey solutions. From end to end, including design, manufacture, transport, install and after mark services.

- Accommodation
- Site Offices & Cribbs
- Kitchen & Diners
- Wet Messes
- Recreation Rooms & Gyms
- First Aid and Health Facilities
- Training and Induction Rooms
- Toilets & Ablutions
- Dirty/Clean Buildings
- Laundries



08 8932 5000 // sales@ntlink.com.au // ntlink.com.au



(CONTINUED FROM PAGE 22)



Northern Territory Primary Industry and Resources minister Ken Vowles visits Edna Beryl gold mine.

According to Mr Vowles, the initiative was already showing results.

"We have seen fantastic interest from the mining sector, including in the Geophysics and Drilling Collaboration program, with the highest number of applicants ever received in the 11 years it has been running

– 36 this year, up from 15 last year," Mr Vowles said.

As part of the initiative, a major airborne geophysical survey was launched in the Tanami Desert.

It was one of the largest of its kind undertaken in the Territory, and the data

it records will help explorers locate mineral deposits they can develop into future mining projects.

The survey was a collaboration between the Government and three private companies.

It would see two planes fly a total of

275,000km over an area of the Tanami Desert 300km west of Tennent Creek to determine where mineral deposits of interest might lie.

"We have seen fantastic interest from the mining sector, including in the Geophysics and Drilling Collaboration program, with the highest number of applicants ever received in the 11 years it has been running – 36 this year, up from 15 last year."

The planes would be equipped with a magnetometer, which measures small changes in the earth's magnetic field caused by the magnetism of underlying rocks.

According to Mr Bicknell, the NT Government also needed to ensure it was well-prepared for major projects in order for them to progress.

"Currently there is a major projects group within Government who work together with the proponents, so the Government needs to ensure they've got the right people in that group," Mr Bicknell said.

"They need to have the necessary knowledge to understand some of these side issues, because often the proponents, when they've got their investors in place, will want to move very quickly."

Mr Bicknell said ensuring the Territory was well-prepared in terms of infrastructure could also be critical to major projects going ahead.

"Now whether that's the proponents putting infrastructure in, or whether it's a joint venture, or it's the government doing it, it needs to be part of that planning process to ensure that it happens properly," Mr Bicknell said.

WE KNOW COMPRESSED AIR

Need a compressed air solution for your project?
We know everything there is to know about compressed air.

Offshore and pipe drying rental equipment
specialists for all mining and gas applications

- 100% Oil Free Compressors & Desiccant Dryers
- Zone 2 & Rig Safe
- Short & Long term hire available

Branches & Support Australia-wide



1800 247 769
www.airpoweredservices.com.au

airpowered
We know compressed air



Rio Tinto's Silvergrass iron ore mine officially opened in 2017.
All images: Rio Tinto.

CENTRE STAGE

Iron ore continues to be a key driver for Rio Tinto, delivering more than 65 per cent of its underlying earnings in the first half of 2018. Now, with coal out of the picture, the miner has plans to grow its Pilbara business and – if the right opportunity presents itself – dip its toes in the battery metals space.

ELIZABETH FABRI

RIO Tinto has shed almost \$US5 billion in assets from its portfolio over the last year, letting go of its Kestrel, Hail Creek and Winchester South coal projects in QLD, as well as one of its European aluminium smelters; Dunkerque.

It's a new era for the dual-listed Anglo-Australian miner.

Coal has been a large part of its business for years, and its exit from the commodity gives a cashed-up Rio additional capacity to grow across its other divisions.

However, it is iron ore that will continue to dominate earnings for the near-future as the commodity rips higher on steady Chinese demand.

At a recent investor webcast, Rio Tinto chief executive Jean-Sébastien Jacques told shareholders the company was open to diversifying into battery metals – like cobalt and lithium – but to not be surprised if the share of iron ore in its portfolio remained the same.

"If you ask me where the company could be in 10 years down the road, having a high level of diversification – iron ore, copper, aluminium, bauxite and potentially other commodities – would be a great thing," Mr Jacques said.

"At the same time, don't be surprised if the share of the iron ore business in five or 10 years down the road is exactly the same as it is today.

"Our world-class iron ore business is really world-class; in the first half of this year we delivered a 67 per cent EBITA margin.

"This business has consistently delivered EBITA margins above 50 per cent for the last 20 years – this is a fantastic asset that we will continue to

2018 HALF YEAR HIGHLIGHTS

- Pilbara production came to **168.8 million tonnes** (Rio Tinto share 140.5 mt) compared to 157mt in 1H17.
- EBITDA of **\$US9.2 billion**, margin of **43 per cent**.
- Reshaping portfolio with **divestments of almost \$US5 billion** including thermal and coking coal assets, and a European smelter.
- Grasberg non-binding HoA signed** for intended **\$US3.5 billion** sale.
- Total cash returns to shareholders of **\$7.2 billion**.
- Koodaideri project **feasibility study underway**.

develop, and there is nothing wrong with having lots of iron ore in our portfolio at this point in time."

Rio Tinto's Pilbara operations produced 168.8 million tonnes (Rio Tinto share 140.5 million tonnes) in the first half of 2018, seven per cent higher than the same period of 2017.

June quarter production of 85.5 million tonnes was also seven per cent higher than the previous year, which can be attributed to favourable weather conditions, the ramp up of Silvergrass, and productivity improvements.

"We have reported another strong set of results with underlying EBITDA of \$9.2 billion and operating cash flow of \$5.2 billion," Mr Jacques said.

The strong half has Rio Tinto placed to land at the upper end of its existing FY19 production guidance of between 330,000 and 340,000 million tonnes of iron ore.

Pilbara Growth

Over the next 12 months, Rio has some big plans – and decisions to make – for its Pilbara business.

In 2017, the miner celebrated the opening of its \$US338 million Silvergrass mine, adding an extra 10mtpa of high-quality ore to annual production to sustain the long-term viability of its Pilbara blend.

Next up is its \$US2.2 billion 40mtpa Koodaideri mine, set to replace existing production in the Pilbara.

Last year, the miner poured \$30.9 million into a feasibility study for the greenfields project, and in August this year approved funding of \$146 million to undertake initial work.

The funds would go towards detailed engineering work, including the development of a rail construction camp, and the first stage of the Koodaideri accommodation camp.

"This is an important step for our Koodaideri project which will be a significant leap forward for the global mining industry and Rio Tinto," Rio Tinto Iron Ore chief executive Chris Salisbury said.

"We've been building mines in the Pilbara for over 50 years, and, subject to final approvals, Koodaideri will incorporate all of that knowledge to enable us to build the smartest, safest and most efficient mine we've ever constructed.

"The deployment of leading edge technology will deliver a step-change in both safety and productivity for our business."

At the September AusIMM Global Mining Leaders conference Rio Tinto Growth and Innovation group executive Stephen McIntosh said there were a "suite of technologies" planned for Koodaideri.

"It's an iron ore development being studied and planned to be our most advanced mine yet," Mr McIntosh said.

(CONTINUED OVER)

(CONTINUED FROM PAGE 23)



“Don’t be surprised if the share of the iron ore business in five or 10 years down the road is exactly the same as it is today.”

Rio Tinto’s Iron Ore chief executive Chris Salisbury and WA Premier Mark McGowan on site at Paraburdoo.

“Digital design, advanced data analytics, machine learning, control loop optimisation and automation all feature strongly.

“We will leverage digital twins in both construction and operation [and] we plan

for it to be our first fully paperless mine.

“It continues our work delivering a fully integrated system bringing together the mine, process plant and rail system including AutoHaul.”

A final investment decision was expected by the end of this calendar year, and if approved construction would begin in 2019, with first production in 2021.

As part of construction, more than

2000 jobs will need to be filled, with 600 permanent roles during the operation phase.

Rio was also busy across its other operations in the Pilbara, with a \$US39 million stacker replacement project underway at its Paraburdoo mine.

In June, the company unveiled plans to replace two 46-year-old stackers at the project, which had been part of the mine’s original infrastructure.

Fabrication will begin this year, with installation and commissioning scheduled to be completed by 2020.

“This is great news not only for Paraburdoo, but also for jobs here in WA,” Mr Salisbury said at the time.

“This project is an important part of our sustaining capital program for 2018 and we’re pleased to be supporting local businesses with this significant body of work.”

Features of the new stackers included an anti-collision system with GPS back up; full automation and monitoring capabilities from Rio’s operations centre in Perth; modern advances in engineering design and mechanical technology; and latest generation variable-speed drive control and fibre optic network infrastructure.

The automation of Rio’s Pilbara train system, AutoHaul, was also hitting milestones.

In July, the company completed its first delivery of iron ore by an autonomous train, with full implementation of the program expected by the end of 2018.

The 280km train journey transported about 28,000 tonnes of iron ore from a Rio site in Tom Price to the port of Cape Lambert, which was monitored remotely by Rio’s Perth team – more than 1500km away.

(CONTINUED ON PAGE 26)


More information can be found at www.airhyd.com.au.

High pressure hydraulic equipment repairers

WA

AIR Hydraulic Power Centre (AHPC) is a family owned business, servicing many industries and applications.

The company specialises in the repair and sales of hydraulic and pneumatic equipment, and offers on and off site support, service, testing, equipment sales,

audits, and customised training and application advice.

AHPC provide equipment registers, which track individual tools and advise when calibration is required.

It also keeps a record of service history using the latest auditing technology.

This ensures that compliance and safety requirements are met and documented to high standards.

SAFETY UNDER PRESSURE
Experts in service, tooling and calibration

www.airhyd.com.au

Master distributors of:

8 Monash Gate, Jandakot
Western Australia 6164

sales@airhyd.com.au

(08) 9417 2933

Thinking globally, acting locally

INTERNATIONAL

SODEXO is a leading facilities management organisation dedicated to delivering quality of life services in more than 80 countries.

Leveraging best practices and commitment from Sodexo operations around the world, the company is driven by an ambitious corporate responsibility plan called Better Tomorrow 2025, addressing issues aligned with the UN Sustainability Development Goals.

Underpinning Sodexo's global presence and Better Tomorrow 2025 commitments is a vast network of suppliers, partners and initiatives that put sustainability commitments into action on the ground, at every one of their sites.

Sodexo's Partner Inclusion program, Aboriginal business incubation, as well as VTEC training and regional employment are just some of the localised activities implemented through the Reconciliation Action Plan Elevate company in Australia.

"Quality of Life is at the core of what we do and we seek to maximise our positive impact through our relationships with our clients, consumers, suppliers and local communities in which we operate," Sodexo Australia director integrated facilities management (IFMS) Darren Hedley said.

"We have developed our approach to corporate responsibility by looking not



Sodexo working in collaboration with the Martu community and local service providers constructing a camp shed at the Matuwa Conservation Reserve.

only at the role we play as a large global organisation, but also the real impact we have as a service provider and employer of choice in Australia.

"Working in collaboration with clients and stakeholders, we use our scale and expertise to develop local strategies aligned with our shared commitment to sustain local communities."



Working together to
improve Quality of Life.

EXPERTISE

Each day, we focus on services that add value to our clients' organisations and improve Quality of Life for over 100 million consumers in 80 countries around the world.

With over 50 years of industry experience, Sodexo's offers over 100 services from catering and cleaning to sophisticated asset management and engineering services, with the scale and expertise to deliver a customised service package with complete service integration. We enhance employee well-being by optimising work processes, ensuring the highest level of safety, and by making remote living more convenient, enjoyable, and comfortable.

Discover how Sodexo can add strategic value to your business, visit www.sodexo.com.au



(CONTINUED FROM PAGE 24)



Part of Rio Tinto's fleet of autonomous haul trucks in the Pilbara.

Challenges

Despite positive growth in the Pilbara, group cash costs rose by \$US392 million in the first half of 2018, after five consecutive years of reductions.

Mr Jacques has flagged inflation as an issue for some time, namely rising raw material costs.

"Let's be clear, inflation is going to hit, it is hitting all commodities and all players across the industry," he said.

"Inflation is coming and therefore it is even more important for us not only to apply the mine to market (productivity program) to our existing assets but apply our mine to market approach to the capital space as well," he said.

However, his views of rising inflation haven't been shared by industry peers.

In an investor call, BHP chief executive Andrew Mackenzie said the company was seeing "the usual things" with inflation on items such as sulphuric acid, diesel and steel, and labour costs, but was "not as affected by that on a net basis as you might think".

Woodside chief executive Peter Coleman also talked down inflation pressures, claiming wages were increasing slowly at between 3 and 4 per cent.

"I've just been on a roadshow and I'm getting asked about price increases in the Pilbara," Mr Coleman told *The Australian Financial Review*.

"It's not a good message because the answer for us is we are not. It was a broad brushed statement but it had reverberations. People are sceptical about our costs. It's actually scaring investors."

Looking Ahead

When asked about any M&A options over the course of the next few years, Mr Jacques said the company was looking



Rio Tinto chief executive Jean-Sébastien Jacques.

"Inflation is coming and therefore it is even more important for us not only to apply the mine to market (productivity program) to our existing assets but apply our mine to market approach to the capital space as well."

at multiple opportunities but would only pursue M&A if it created significant value for shareholders.

"We have looked at some opportunities recently but at this point in time, nothing really excites us," Mr Jacques said.

"However, you never know, maybe one day we will find one which creates a lot of value.

"Having said that, I think it's important to understand that we have plenty of opportunities to grow; we don't need M&A to grow for the sake of it.

"We continue to invest in the iron ore business in the Pilbara, WA.

"We are also investing as we speak in Amrum, which is a very large bauxite project in QLD, and we continue to invest in our copper and gold project Oyu Tolgoi in Mongolia."

INTRODUCING PHS ZEPHYR

OUR CUSTOM-BUILT HYDROGRAPHIC SURVEYING VESSEL ENABLING RAPID RESPONSE

Custom-built, multi-purpose hydrographic survey vessel equipped with state-of-the-art equipment, enabling rapid response

Built to high specification and crewed by a team of dedicated and certified specialists



PHS have recently expanded its service capability by owning and operating a custom-built, multi-purpose hydrographic survey vessel. It is equipped with state-of-the-art hydrographic survey equipment enabling rapid response and the ability to make the most of opportunities limited by tidal, weather or time constraints.

Aptly named, *PHS Zephyr* is road towable and capable of rapid deployment. The large cabin and aft working deck make it capable of operating multiple sensors simultaneously. *PHS Zephyr* is a mono hull design vessel fitted with a moon pool, deck winch and davit for combined survey operations of multibeam, towed side scan and magnetometer. Additionally, current transects can be conducted using an Acoustic Doppler Current Profiler deployed through the moon pool or overside. *PHS Zephyr's* shallow draft and manoeuvrability means it is well suited to shallow water and port survey operations.



PrecisionHydrographicServices

www.precisionhydrographic.com.au
info@precisionhydrographic.com.au

10 Ragless Street, St Marys, S.A 5042
PO Box 1213, Blackwood, S.A 5051
+61 (8) 8351 1203

13B Crane Circle, Karratha, W.A 6714
+61 (8) 9143 1133

PROFESSIONAL. INNOVATIVE. RELIABLE.

BCM system conveys big benefits

NATIONAL

CONTITECH, part of Continental AG, has released information about its new belt condition monitoring system, CONTIMultiProtect.

This latest solution combines the features of the traditional CONTIRipProtect and CONTICordProtect into one multifunctional system for increased features and connectivity.

With more than 100 units already installed worldwide, the ContiMultiProtect system has taken Belt Condition Monitoring (BCM) to the next level.

Customers can now benefit from automated continuous monitoring of their conveyor belts for cord integrity, splice condition, and detection of longitudinal rips, to maximise operational safety, increase uptime and lower their maintenance and unscheduled stoppages.

The CONTI MultiProtect monitors the belt continuously as a permanent installation, analysing the magnetic characteristics of the conveyor belt and alarming when it detects a longitudinal rip, cord damage and deviations in the splice.

All of this is visible on demand from a nominated desktop, laptop or through alerts issued to site operational systems, email or SMS.

It consists of three principal areas of conveyor belt monitoring: longitudinal rip detection, cord condition monitoring, and splice monitoring.

According to ContiTech Australia's regional manager Ben Wood there is a fair amount of flexibility in terms of system functionality.

"Our systems produce a customised belt map and report important belt-related condition.

With reports on demand, stop at location feature and customisable alarm and action parameters, the system monitors a customer's asset 24/7 in real time," Mr Wood said.



Image supplied courtesy of Fortescue Metals Group Ltd

Smart technology minimises production disruption

Conti™MultiProtect continually monitors 14 stockyard belts at this Anderson Point iron ore stockyard in the Pilbara. One successfully detected an early belt rip, automatically shutting down a vital conveyor for repair before any further significant and very costly damage was caused.

> Prevent costly damage > Prevent downtime incidents > Increase belt lifetime
> Increase up-time, system availability and reliability > Flexible operation according to your requirements. Contact us now and get better conveyor belt performance for your site.



Monitoring is visible on demand by multiple users at the same time from any nominated desktop, laptop or through alerts issued to site operational systems, email or SMS

ContiTech Australia Pty Ltd
www.contitech.net.au
+61 3 9721 0600 Melbourne VIC
+61 8 6240 3500 Perth WA

+61 8 9186 0500 Karratha WA
+61 7 4841 9800 Mackay QLD
+61 2 8839 9600 Parramatta NSW
+61 2 4966 3493 Beresfield NSW

ContiTech



More information can be found at www.contitech.net.au.

A trusted long-term partner

NATIONAL

GHD is a global professional services company providing multidisciplinary engineering, architecture, environmental science, advisory and construction management services.

Established in 1928, GHD employs more than 10,000 people in more than 200 offices worldwide, including 4000 employed in Australia, operating in the markets of energy and resources, water, environment, property and buildings, and transportation.

The company is committed to regional presence with offices in all major Australian capital cities and regional centres, putting them face-to-face with clients.

GHD has operated in WA since 1975 and has more than 700 people in offices in Perth, Bunbury, Albany, Geraldton and Karratha.

Its client partnerships are underpinned by its values of safety, teamwork, respect and integrity.

In the resources sector, GHD has a long-term relationship with Tier 1 through to smaller organisations, government regulator entities as well as the public and private utilities providers including water, power, logistics and infrastructure.

A key GHD differentiator is its 100 per cent employee owned business model.

Working collaboratively with its



Image: GHD.

More information can be found by visiting www.ghd.com.

clients and stakeholders, GHD focusses on providing excellent client service and outcomes that exceed expectations.

The company is flexible and experienced in different delivery models including working in integrated client teams, as owner's engineer, and with EPC and PECM project delivery models.

GHD has delivered numerous greenfields and brownfields resources projects of all sizes and complexities across Australia.

At GHD, safety is paramount.

Its objective, "Safe You, Safe Me, Safe GHD," means embedding HSE into every aspect of its operations, which is

demonstrated by its industry-leading safety outcomes.

GHD provides support across the entire value chain and lifecycle of projects including, design, projects, strategic advisory services, environmental, approvals, power, water, transport, and property and buildings.

Its renewable success with Horizon Power's EPCM contract in 2014 has spearheaded significant power and renewable energy capabilities.

With more than 80 people in the Power Group in WA, GHD now has one of the largest power design and delivery teams in Australia providing innovative

solutions to the power industry.

This provides GHD with a unique understanding of current challenges and opportunities in the industry, both public and private.

GHD strives to provide quality, diverse and inclusive workplaces.

Randstad Australia ranked GHD as number one most attractive employer to work for in the engineering sector in 2017.

GHD is also a WGEA employer of choice for gender equity.

The company is nationally recognised for its advocacy and commitment to indigenous engagement and economic development, having led the establishment of six indigenous businesses in varied sectors including construction, civil works, hotel development, international development, trade and IT infrastructure.

GHD is at the forefront of digital engineering.

Creating and utilising data across the entire lifecycle of a physical asset, GHD is skilled in BIM and virtual and augmented reality solutions that are transforming the way its clients work by enhancing the life and value of project and asset optimisation outcomes.

GHD has established an advisory business unit to augment its technical capabilities, providing its clients with strategic, financial, risk, due diligence, transaction support, business case, asset management and operational excellence services.

A trusted partner for your journey in resources



GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. GHD believes in long term relationships that lead to sustainable value for our clients.

Our connected global network of 10,000 people can deliver engineering, architecture, environmental and construction services for your next greenfield or brownfield project. To learn more, please contact Rohan Watts on 0438 955 834 or Craig Walkemeyer on 0404 800 263.

MAKING MOVES

Western Areas has a lot to look forward to with development pushing ahead at its new Odysseus prospect, and continued exploration opportunities across its Forrestania operation, and newly acquired Western Gawler tenements.

Flying Fox at night.
All images: Western Areas.

JESSICA CUMMINS

NICKEL-focused miner, Western Areas, almost doubled its net profit from \$4.8 million to \$8.3 million in the second half of FY18 in line with improved nickel prices.

With free cash flow of \$19.1 million as of 30 June, Western Areas managing director and chief executive Dan Lougher said the company's midterm outlook was to utilise cash on hand to accelerate exploration.

Mr Lougher also had high hopes for its newly commissioned Mill Recovery Enhancement Project (MREP) at Forrestania, with increased market interest in its new high-grade nickel product.

Mill Recovery Enhancement Project

The company's MREP project, successfully commissioned in April, will create a product for the EV battery supply chain from a specific cut of the live tailings stream that was previously discarded.

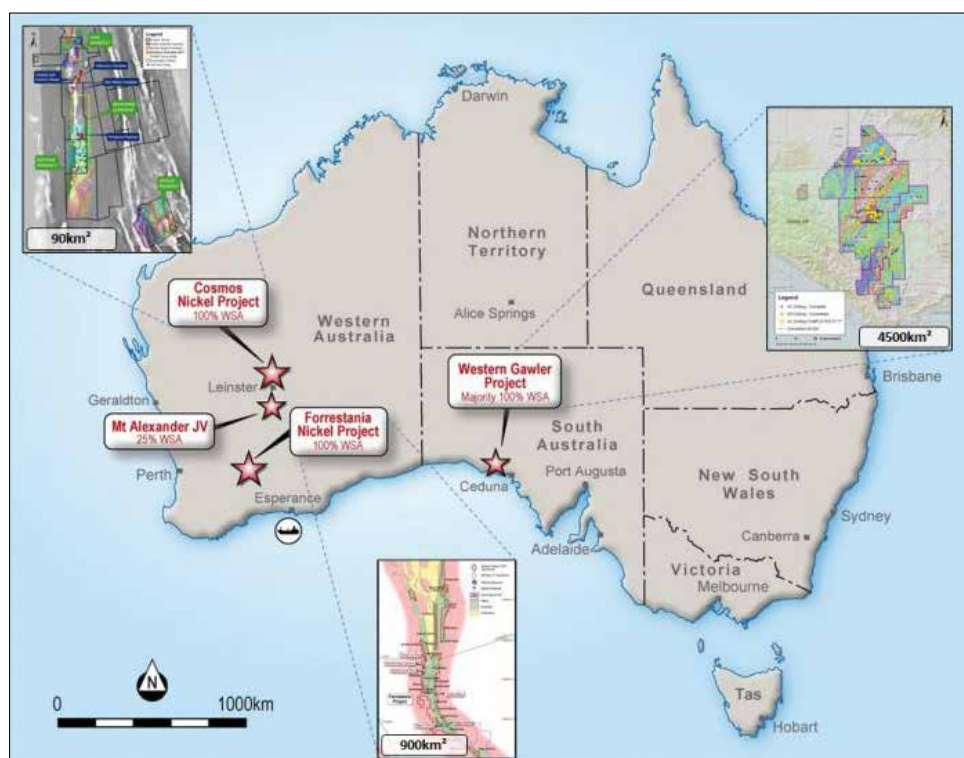
"We basically take that product out of the milling stream and put it through bacteria tanks to produce a super high-grade 50 to 55 percent nickel sulphide," Mr Lougher said.

Mr Lougher said once the bagging facility was completed later this year, the product would be sold to Japan, Korea and China, where interest was extremely high.

The product is set to attract premium pricing above its existing concentrate terms and would open doors for the company into the EV market.

"With significant interest in this new product, including parties related to the electric vehicle sector, we have hosted many site visits in recent months," he said.

"We will soon commence dispatching samples to a select group of potential customers as part of securing a new offtake agreement."



Location of Western Area's key tenement holdings.

Mr Lougher said Western Areas was also advancing test and study work on the New Morning heap leach project, utilising its BioHeap process.

"The crude nickel sulphate solution produced from the heap leach can be processed at the back end of the MREP plant, which has in-built capacity for around 4000 tonnes of contained nickel," he said.

"We are now working through the required environmental approvals and studies, with a goal for New Morning to be an operational mine in the coming years."

Cosmos Nickel Project

Then there was Western Areas' Cosmos nickel project, 40km north of Leinster.

Originally discovered by Jubilee Gold mines in 1997, Cosmos began with an open pit mine before transitioning into an underground operation.

In 2015, Western Areas acquired the project from Glencore subsidiary Xstrata for \$24.5 million.

Mr Lougher said the acquisition could not have come at a better time in the commodity cycle with positive forward forecasts for nickel.

The project, which contains the high-grade Odysseus deposit, is set to become the company's second mining operation.

"The Cosmos nickel complex will complement our existing Forrestania nickel operations, and is an excellent, prudent and low cost investment which is consistent with our brownfields acquisition strategy," Mr

Lougher said.

In March 2017, the Odysseus Pre-Feasibility Study (PFS) confirmed commercial viability of the project.

Then, in April this year a \$32 million early capital works program kicked off, which included the construction of 520 rooms at the mine camp, the refurbishment of existing ponds, in pit pumping, evaporation ponds and decline dewatering and rehabilitation.

Once this was complete, Mr Lougher said Odysseus will be development ready – with a mine life beyond 10 years and average production of about 12,000 tonnes per annum of contained nickel in concentrate.

High-grade drill results were received during the June quarter at its Odysseus North target, which saw M5 and AM6 orebodies containing 53,000t nickel, and massive sulphide success beneath Odysseus.

Mr Lougher said the results demonstrated confidence the project would become the company's third operating mine.

The Definitive Feasibility Study (DFS) was scheduled for release at the end of September, which is set to deliver a larger and longer mine life.

Western Gawler Project

In late July, Western Areas also strengthened its regional exploration footprint in South Australia through a strategic agreement with Iluka Resources.

The farm-in joint venture agreement enabled Western Areas to earn up to a 75 per cent interest in base and precious metal rights and all additional basement-hosted mineral and rare earth elements across five tenements in the Western Gawler region, covering 5070sqkm.

The tenements are adjacent to its existing tenure within the region, where it has been active in exploration for several years.

(CONTINUED ON PAGE 32)

Rockwater’s hydrogeologists lead in mining

NATIONAL

WA’s largest hydrogeology consultancy team, Rockwater is well placed to provide hydrogeological services to the mining industry.

Rockwater specialises in water supplies, mine dewatering, geothermal projects, aquifer recharge, groundwater-related investigations and environmental assessments.

Established in 1974, Rockwater has successfully operated across Australia and internationally.

Rockwater played a key role in Western Areas’ Forrestania project, spanning 15 years from early stage project approvals to mine dewatering and other groundwater-related activities.

Rockwater’s contribution to the Forrestania project has included dewatering Spotted Quoll mine, testing and implementing wastewater injection, and groundwater evaporation pond monitoring and recovery.

Other recent projects include groundwater test works and evaluation for Sheffield Resources’ Thunderbird project on the Dampier Peninsula; proving up a dewatering scheme for Consolidated Minerals’ Woodie Woodie mine; and development of a groundwater supply for Copper Mountain’s Cloncurry Copper project.

Rockwater is now working with Silver City Drilling and Water Corporation to provide complete hydrogeology services for a major Perth Basin deep bore-construction program.



Image: Rockwater.

Rockwater assisted Western Areas to effectively dewater deposits to assist the underground mining.

It has continued to meet the reporting requirements to the Department of Water and Environmental Regulation for Alcoa’s WA operations since 2006.

Rockwater’s specialised team is renowned for designing and delivering geothermal

projects, with 14 deep geothermal heating systems and 10 shallower heating and cooling systems in the Perth Basin, and now provides expertise in this field throughout Australia with active projects in QLD, Victoria, NSW and Tasmania.

This year, Rockwater’s hydrogeologists travelled to QLD to oversee the development of a groundwater supply for the Copper Mountain Cloncurry project.

More information can be found at: www.rockwater.com.au.



In operation for over 40 years we have Australia’s hydrogeology challenges covered from major mining projects to remote community water supplies

Our services include:

- Groundwater Supplies
- Mine Dewatering
- Environmental Studies
- Biological Surveys
- Geothermal Projects
- Managed Aquifer Recharge
- Numerical Modelling
- Geophysical Logging
- Groundwater Sampling and Monitoring
- Groundwater Contamination Control

(CONTINUED FROM PAGE 30)

“We are confident that the EV market will become more dominant but we still need a strong stainless steel market - 30 per cent of the nickel market in the world is stainless steel and we don’t want that to fall by the wayside.”



The key focus for Western Areas was to gain access to the remainder of the Fowler Domain that falls within Iluka’s Eucla Basin project area.

“We were already exploring in that area three years ago when we looked across potential exploration areas in Australia and the attraction for us was that the area was unexplored and it was similar geologically to the Fraser range in WA, which holds some interesting exploration targets,” Mr Lougher said.

“Iluka was exploring mineral sands in the area and they had adjacent tenements to ours so when they decided they were changing their exploration strategy we decided to have a conversation and come up with a Joint Venture.”

The Fowler Domain, at the western end of the Gawler Craton, was considered highly prospective for nickel, iron oxide, copper and gold.

Mr Lougher said the prospective greenfields exploration asset offers great discovery potential.

“We are currently in the process of reviewing Iluka’s database, which contains airborne style data, to access the best areas or targets that remain within their tenement areas.”

Mr Lougher said with the company’s positive cash flow generation, Western Areas has always looked to access opportunities where the initial investment was relatively low, but the potential rewards are high.

“Our exploration team is ready to begin a work program aimed at identifying high-priority drill targets building on the significant geophysical programs and target generation work that Iluka has completed over the last four years,” he said.

Mr Lougher said that combining the Iluka Joint Venture ground with its existing

tenement holdings maximised the potential for a significant discovery.

Airborne EM surveys will be completed in FY19, with an integrated series of belt scale exploration campaigns planned.

Prospects on its existing tenure included Thunderdome, Atomic Cafe and Citadel, which host numerous prospective mafic and ultramafic intrusive bodies.

Mr Lougher said initial work aimed to test these prospects, along with its associated prospective corridors along strike, which extend into the Iluka Joint Venture ground.

Work would also focus on advancing several untested geophysical targets previously identified by Iluka.

The Year Ahead

Looking forward, Western Areas expected production to be marginally higher in FY19



**P&D STEPHEN
TRANSPORT PTY LTD**

BULK SPECIALISED WATER CARTAGE

☎ **08 9049 1354**

📠 **0417 491 354**

✉ stephen.transport@bigpond.com

📍 PO BOX 130, SOUTHERN CROSS

**Proudly supporting
Western Areas**

with Forrestania’s Spotted Quoll contributing to 60 per cent of overall production.

The company aimed to invest more in additional exploration programs at Cosmos and Western Gawler; the first resource extension drilling program will also take place at Spotted Quoll, which has not been drilled since 2009.

“We are looking to push exploration at our New Morning and Odysseus projects as well as push our alignment with the EV and battery vehicle market,” Mr Lougher said.

“With the nickel stock market coming down our view is we will see improvements with pricing.

“We are confident that the EV market will become more dominant but we still need a strong stainless steel market.

“30 per cent of nickel market in the world is stainless steel and we don’t want that to fall by the wayside.”



Panorama view of Western Areas Flying Fox processing plant.

Image: University of New South Wales.

PUSHING THE BOUNDARIES

The benefits of virtual reality for miners are growing at a rapid pace, particularly in training and safety. Now, it could be time to expand the technology and begin looking at fully integrated systems.

AMY BLOM

AUGMENTED and virtual reality has become more widespread within the mining sector and according to researchers, exciting developments could be on the horizon.

Virtual reality has already been used by numerous universities and organisations in Australia as an educational tool for engineering students and future mine workers.

In recent years, the technology has also been used as a safety training tool for miners and rescue brigades in Australia.

Internationally, virtual reality is emerging as a way to integrate mine planning data for use in the design and planning, resource management, and community and investor relations.

University of New South Wales School of Minerals and Energy Resources Engineering Professor Serkan Saydam believed the next step for virtual reality in mining was the integration of data through decision-making.

It is an idea he has already examined, having innovated a virtual reality program designed to integrate data for use in the reporting and decision-making process.

Known as ViMINE2, it was developed from the earlier ViMINE, which had been created as an educational tool for the UNSW School of Mines engineering students.

"There's obviously benefits for training students and the workforce, but my initial idea was about using it for decision-making in feasibility studies," Professor Saydam said.

"Mine planning engineers and geologists



ViMINE allows students to follow through the full life of a mine.

Image: University of New South Wales.

use mine planning information and they use different software packages, so I was dreaming of integrating them.

"So it would be about using this facility to basically rethink different software outputs, accepting it as an input and generating 3D animations of the running mine, but you can also include actual data and change the data; you need to be able to do all the different scenarios."

Professor Saydam said this could prove more useful than traditionally written reports and studies as a way of imparting information to and impressing investors

and senior management teams, allowing them to make decisions more easily.

Despite its potential, Professor Saydam said mining companies had generally thought it had been a good idea, but not compulsory.

He said part of the reluctance to take up technologies such as ViMINE could be attributed to the attitude that virtual reality was still too new and was yet to be user-friendly enough.

"The facilities are also not quite there, it still requires some technological expertise to run these and senior management may

not like to use this, they still prefer to read from a report," Professor Saydam said.

"Currently we can use virtual reality easily with goggles, but imagine a senior management team wearing goggles on their faces while trying to make a decision, it's not going to happen.

"I think the next level will be using holograms and really being able to show it to senior management teams from a small table.

"People watch movies like Star Wars with holograms appearing and they think 'what a movie' but this technology actually already exists."

Despite the initial reluctance, Professor Saydam believed it was simply a matter of time before attitudes and technology matched up with the needs of the mining industry and virtual technology would be more comprehensively utilised within the sector.

Ground-breaking Education

While ViMINE2 has not been taken up commercially, the original ViMINE has proven a big success, with 86 universities and organisations currently utilising the system.

ViMINE allows students to experience various aspects of a mining operation throughout the whole life of a simulated mine from initial exploration to final site rehabilitation.

UNSW was also home to a virtual reality simulator consisting of floor to ceiling screens casting 360-degree 3D images, allowing students to experience hands on learning

(CONTINUED ON PAGE 35)

VRT finds success in blended learning



Trainees using the new electronic classroom.

Image: Mines Rescue.

NATIONAL

LEADING mining industry training provider Mines Rescue has taken advantage of the Virtual Reality Technologies (VRT) Gen4 training system to deliver a successful blended learning pilot program, in collaboration with one of its biggest customers.

Weighted towards virtual reality scenarios and eLearning, coupled with trainer presentations and competency based practical assessments, the project has seen the creation of an electronic classroom model to suit the customer's exact training needs.

Developed by VRT, a provider of world class VR training software and the innovation arm of NSW industry body Coal Services, the Gen4 system represents

the culmination of more than a decade of development.

For Mines Rescue, that system gives them the opportunity to expose more than 2500 mine workers in the southern region of NSW to virtual reality training, as well as allowing for the creation of the new electronic classroom model for safety refresher training.

With the use of these technologies, Mines Rescue is able to provide a safe training environment to ensure minimal impact on productivity, and the opportunity to explore multiple scenarios in a controlled environment.

With the pilot working at Southern Mines Rescue Station, there is an intention to transition to a full electronic classroom model.



Provide your employees with the best possible outcomes by partnering with the market leader in holistic training for the mining and emergency services industries, to protect your workers by providing critical hazard awareness understanding and improved safety capabilities.

- Customised practical training solutions that work for your whole organisation
- Innovative industry specific training scenarios and practical assessments



Find out more at
www.gen4.info

02 4286 5464 sales@gen4.info





(CONTINUED FROM PAGE 33)

“Through the use of new technologies such as virtual reality, there may be an opportunity to elevate the quality of support delivered to injured workers in remote locations.”

Dr Shiva Pedram worked with Coal Services to assess the effectiveness of its virtual reality training for miners and rescue brigades.

without ever having to leave campus.

The Advanced Visualisation and Interaction Environment (AVIE) gave students the opportunity to walk through 360 degree panoramas of the Ranger uranium mine in the Northern Territory to undertake feasibility testing.

Students were also able to take part in 3D terrain explorations, work through outburst management experience emergency and evacuation scenarios.

Professor Saydam said his team was now working with the university’s psychology department to fully understand the learning capacity involved with virtual reality technology and how it could improve.

“The other question is how effective is virtual reality in learning and teaching,” Professor Saydam said.

“When we use the virtual reality technology in our teaching, students are happy, but we’re never comparing the two because we run the same modules with every student.

“The only outcomes we get is from students who use the virtual reality, so studies should also include students learning with and without virtual reality.”

Supporting Mental Health

Advancements in virtual reality technologies were not limited to mine planning and business decisions.

Associate Research Fellow at the University of Wollongong’s SMART Infrastructure Facility Dr Shiva Pedram believed virtual reality could soon be used to provide mental health support to miners in remote locations.

She was working with Mines Rescue and Coal Mines Insurance to study the effectiveness of off-the-shelf technologies, such as virtual reality headsets, to deliver virtual therapeutic counselling sessions.

According to the Black Dog Institute up to one in five Australians have experienced symptoms of a mental disorder in any given year, with mine workers being no exception.

Dr Pedram said for these workers, the remote location often served as an impediment to receiving necessary treatment.

“Through the use of new technologies



Image: University of New South Wales.

86 universities and organisations are using ViMINE worldwide.

such as virtual reality, there may be an opportunity to elevate the quality of support delivered to injured workers in remote locations,” Dr Pedram said.

“However, study needs to be done to investigate the usefulness of such therapeutic solutions.

“Adapting virtual reality as a therapeutic solution requires a clear understanding of how patients interact with the VR environment, which can guide the numerous decisions regarding the structure and interface of the technology.”

Ensuring Safety

Dr Pedram was no stranger to virtual reality in mining, having worked on evaluating the technology as a safety training tool for miners as part of her PhD.

The project specifically focussed on training rescue brigades for extreme or catastrophic situations.

Much of it was predicated on the idea that while miners have long had comprehensive classroom-based training to learn about the hazards they would encounter on site, it could never be the same as being confronted with these

challenges while underground.

To overcome this, industry safety training provider Coal Services developed a cinema-like virtual reality room with a 360-degree screen that was 10 metres in diameter and four metres high.

Up to eight miners in full protective gear could enter the room and experience simulated explosions, gas leaks and routine safety inspections with the help of 12 cameras projecting 3D images with full surround sound.

According to Dr Pedram, virtual reality used in this way could be an effective way of preparing miners and rescue brigades.

“The Australian mining industry has steadily achieved remarkable performance and safety results through continuous improvement of its training standards,” Dr Pedram said.

“Virtual reality-based training is the most recent technology used to enhance miners’ competencies in a safe and controlled environment that allows for replicable testing extreme event scenarios.”

Dr Pedram said there were a number of ways virtual reality was preparing mine workers for day to day operations.

“A range of equipment simulators including dozers, jackleg drill, dragline,

haul truck, shovel, continuous miner, longwall and roof bolter are available to train new miners or refresh the knowledge of existing miners,” Dr Pedram said.

According to a LlamaZOO, a Canadian company that creates virtual reality products for mining companies, the safety benefits of using virtual reality in mining could extend well beyond training.

The company believed it was not far off to think that operators could control machinery remotely using the technology to virtually be sitting in the cab of a shovel or haul truck.

Potential future uses could also allow operators to make better use of their downtime by employing virtual reality to escape to relaxing scenes, or even using it to engage at a distance with their families.

Augmented Reality

Beyond the confines of virtual simulation suites or large head gear, has been the rapid advancements of augmented reality.

Unlike virtual reality, which was designed to be entirely simulated, augmented reality was intended to overlay simulated graphics onto a real-world view.

This would provide less immersion than virtual reality, but more freedom for the user with no need for virtual simulator rooms or headgear.

Rather, it is often achieved through the use of smart phones, smart glasses and other lightweight products.

The development of this technology has already been utilised to track heavy mining equipment, trucks and light vehicles across Australia’s mining sector, with mining contractor Downer reportedly taking up the technology for its fleet in June.

According to a 2016 research paper released by South African academics, augmented reality had the potential to greatly benefit the mining process if the design of an augmented reality application was done effectively.

The researchers from the University of Pretoria and the Tshwane University of Technology found effective uses regarding drilling applications, navigational aid and operator assistance, maintenance and repair, and provision of real-time information.

A BRIGHT FUTURE

Australia's coal industry has faced difficult times in recent years, but as coal prices stabilise, companies such as Anglo American are beginning to thrive.

All images: Anglo American.

AMY BLOM

LESS than three years ago Anglo American looked set to exit the Australian coal industry, but now its coal operations are stronger than ever, with its Moranbah mine in QLD posting record production.

Anglo American metallurgical coal business chief executive Tyler Mitchelson said the company was pleased with the performance of its metallurgical coal business as the company continued to find opportunities to improve productivity.

"Moranbah North five years ago was producing about 5 million tonnes (mt) of run-of-mine coal per year, and with the same equipment and mine it recently produced over 10mt over a 12 month consecutive period," Mr Mitchelson said.

"As the largest underground coal miner in Australia, we've been able to leverage out scale in having three large undergrounds and our considerable expertise in longwall mining.

The new figures from Moranbah North come after the release of Anglo American's second quarter production report, which showed its metallurgical coal production had increased by 33 per cent to 5.3 million tonnes driven by the strong performances at Moranbah and Grosvenor.

Anglo American's total Australian coal production for the quarter was more than 5.5mt.

Difficult Times

The recent success was a far cry from Anglo American's announcement in December 2015 that it would reduce its global portfolio from 55 to 20 assets after it posted a 62 per cent fall in underlying earnings to \$US827 million.

At the time, the mining giant also posted a \$US5.6 billion net loss on \$US5.7 billion in write downs.

By February 2016 it had announced it would sell off even more assets, whittling them down to just 16, while it shrank to a core



Metallurgical Coal from Grosvenor and Moranbah North coal handling and processing plant (CHPP).

portfolio of diamonds, copper and platinum group metals.

This included the sale of Dartbrook, Callide and Foxleigh, which were successfully divested throughout 2016.

Anglo Australian had also announced it would sell Moranbah North, Grosvenor and Moranbah South as a package, while it would continue to manage Grasstree and Capcoal while it considered its options to exit.

Instead, Anglo American held on as coking (metallurgical) coal prices quadrupled in 2016 to reach \$US307.20 a tonne.

While the price of coking coal has fallen again as it corrects itself in the two years since then, it has not dropped to the lows of 2015, instead averaging about \$US193 per tonne.

Looking Up

As a sign of the Australian coal industries current strength, and Anglo American's place in it, the company has ramped up its Grosvenor operation.

Output reached 1.3mt in the June quarter, as it strived to reach nameplate capacity.

Anglo American has continued to own five coal major coal operations in Eastern

Australia.

These were Capcoal, Dawson, Moranbah North, Grosvenor and Aquila.

Anglo American has also continued to examine Moranbah South as a future project.

"We will continue to look for opportunities to innovate and optimise the value of these assets," Mr Mitchelson said.

Anglo American has also increased its exploration activities globally, including in Australia.

The miner increased its exploration and evaluation expenditure for the quarter by 38 per cent to \$US72 million.

Exploration expenditure increased by 17 per cent to \$US27 million and evaluation expenditure increased by 55 per cent to \$US45 million.

In Australia, Anglo America's exploration activities focussed on thermal, coking and hard coking coals.

Beyond its success in coal, Anglo American chief executive Mark Cutifani said the company had another strong performance during the first half of this year, with an 11 per cent increase in underlying earnings before tax, depreciation and amortization (EBITDA) to \$US4.6 billion and a 19 per cent on capital employed.

"We have also made good progress against our disciplined capital allocation objectives, strengthening the balance sheet with net debt down to \$4 billion, delivering an increase in the dividend commensurate with earnings, and continuing to invest prudently across the business," Mr Cutifani said.

"This strong financial result derives from our consistent productivity improvements in the underlying operations and a stronger price environment for many of our products."

Coking Coal is Here to Stay

Commit Works chief executive Paul Moynagh, whose company has been partnering with Anglo American for about six years, said while there had been some worrying times in the past, the future looked bright for the company and Australia's metallurgical coal industry as a whole.

"I think you've got to realise that there's a difference between thermal coal and metallurgical coal, and I don't think that's picked up on by most people," Mr Moynagh said.

"You can't make steel if you don't have metallurgical coal, and that's why this stuff in QLD is more highly valued than thermal coal in NSW."

He said thermal coal was still necessary as well, however it was likely it would be replaced in coming decades as renewable and battery technology advanced.

"Right now we need coal and it's still a big export for the country, but I think thermal coal will get replaced over the next 10, 20 or 30 years as more and more renewables come in and batteries get better," Mr Moynagh said.

According to Mr Moynagh, the stability of Australia's coal industry was not just necessary for the mining giants operating within it such as Anglo American, but also for their partner organisations and smaller economies such as those in Newcastle, which were still heavily reliant on coal.

Short Interval Control app a powerful tool for improving underground production

NATIONAL

THE team at Commit Works have been implementing Short Interval Control (SIC) systems for more than 20 years in mines.

Short Interval Control (SIC) enables frontline leaders to see how their process is performing against a plan throughout a shift.

Each shift is broken into short intervals (of about two hours) where supervisors review performance against targets. This allows them to address any issues before they become unnecessary waste, and to co-ordinate day-to-day work better.

The central idea behind SIC is that when supervisors are more aware of how their process is performing during the shift, then they will be able to act to keep the process on course to hit its target each shift.

What does the Commit Works SIC app do?

Using mobile technology and real-time data, the app lets supervisors track work on their tablets or mobile phones while they are on site.

It connects to the company's existing scheduling software, Fewzion, so that the work of underground crews is regularly measured against plans and updated in real time.



Underground miner in North Queensland using the SIC app.

Why choose the Commit Works SIC app?

An increasingly competitive market means that mines need to work more efficiently to maintain their profits.

While the mining industry has

traditionally used paper-based SIC, this app is more effective and reliable because it gives supervisors real time insights into what's happening at the coalface and enables them to respond quickly to improve results every shift.

"Short Interval Control is one of the most

powerful tools for improving production, Commit Works chief executive Paul Moynagh said.

"We're pleased to bring our app to underground mining operations because it offers the best available system for tracking work and boosting results."



COMMIT⁺.WORKS

SOFTWARE TO OUT PLAN UNCERTAINTY

- FEWZION
- SHORT INTERVAL CONTROL
- VISUAL OPS



All images: Altura Mining.

CHASING GROWTH

Production began at Altura Resources and Pilbara Minerals' identically named Pilgangoora projects several months ago, and the companies are already eyeing expansions with strong interest from buyers.

JESSICA CUMMINS &
ELIZABETH FABRI

WA is in the box seat to tap into growing global demand for electric vehicle and static storage batteries.

In recent months, discussions have been centred on the idea the State could establish itself as a 'lithium valley'; essentially a global hub for lithium mining and downstream processing.

The State was already home to the mammoth Greenbushes mine, and newly opened Mt Cattlin project and Mt Marion mine, near Coolgardie.

Newly minted Pilbara producers, Pilbara Minerals and Altura Mining were also making massive strides, beginning production at their neighbouring Pilgangoora projects in June and July respectively.

Speaking at the opening of Altura's mine in September, WA Mines minister Bill Johnston congratulated the miner on its achievement, citing the Government's newly established Lithium and Energy Materials Industry taskforce, which aimed to capitalise on the State's potential to produce and process lithium and other energy materials.

"Our aim is to help companies like Altura develop the State's world-leading lithium industry, which creates opportunities and jobs for Western Australians," Mr Johnston said.

"We have an abundance of lithium and other battery minerals, and the McGowan Government is committed to making the most of this once-in-a-generation opportunity.

"By expanding further into the battery materials value chain, the State will further diversify the WA economy and maximise benefits to the local community."

In 2017 WA lithium sales reached \$780 million, and the sector employed more than 1200 people.

This number is set to explode as new projects like Pilgangoora come online, as well as Tawana Resources' Bald Hill project, and Kidman Resources' Earl Grey project.



The opening of Altura's lithium mine.

Pilbara Minerals

Pilbara Minerals' Pilgangoora lithium-tantalum project was on track for its first spodumene concentrate shipment at the end of September.

In a statement, the company said the Pilgangoora 2mtpa Stage 1 concentrator was achieving strong production throughput for both coarse and fines circuits.

"Both circuits are achieving exceptional product quality, confirming the ability of the Pilgangoora Project to deliver a premium quality product to world markets," the company stated.

"The company is on track to deliver a minimum of 5000 tonnes of spodumene concentrate ready for ship-loading in Port Hedland from approximately 20 September, with the focus now on growing production and stockpiling concentrate (both on site and in Port Hedland) for subsequent shipments to Pilbara Minerals' premier customer group."

Momentum was also building for Stage 2 of the project.

In August, the company announced the outcomes of its Stage 2 Definitive Feasibility Study (DFS).

While the DFS confirmed a slight increase in capital costs from \$207 million to \$231 million, the engineering re-design introduced an additional 3mtpa circuit compared to the 2.5mtpa contemplated by

the PFS.

Pilbara Minerals said the Stage 2, 5mtpa expansion would be a globally cost competitive operation producing between 800,000 and 850,000tpa of high-quality spodumene concentrate over its 17 year mine life.

The expansion already had strong support from all four of Pilbara Minerals' cornerstone customers and strategic partners.

"The encouragement from our partners, General Lithium, Ganfeng Lithium, Great Wall Motors and POSCO, to expand our operations has been outstanding," Mr Brinsden said.

"These highly experienced partners know the market and their ongoing support, particularly with Stage 2 financing, is a clear demonstration of the strong future demand for lithium and the high quality of the Pilgangoora project."

On 17 September, the company also announced a 35 per cent increase in proved and probable ore reserves to 108 million tonnes.

"The continued growth in Ore Reserves reflected the quality and scale of the Pilgangoora project and truly sets the scene for our Stage 2, 5Mtpa expansion," Mr Brinsden said.

Pilbara Minerals said production was set to expand to 5mtpa from the fourth quarter of 2019.

Altura Mining

Altura's Pilgangoora project, was also going to plan with its first haulage of spodumene product delivered to the Qube storage facility in Port Hedland in August.

Ramp up to 220,000 tonnes per annum was targeted for the end of the calendar year, and an expansion will see production double to 440,000 tonnes of lithium concentrate per annum in the first half of 2020.

Altura recently completed a scoping study looking into the potential expansion.

"The results we received were outstanding, with NPV of the project increasing to \$834m, IRR of 63 per cent and a 2.3 year pay back," Altura chief operating officer Chris Evans said.

"More importantly, Stage-2 is significantly de-risked by having all major statutory approvals, key personnel and contractors in place from Stage-1.

"A decision will be made in due course."

On the exploration front he said the company would continue to build on its world-class resource.

In early September, the company announced it had commenced a geophysical survey at its Cleopatra prospect, 3.5km southeast of Pilgangoora, which has identified gold and copper anomalies.

Positive drill results were also confirmed at the Southern Ridge deposit in April, which has been earmarked for infill drilling due to its potential to increase the ore reserve and mineral resource estimate of the Altura project.

Mr Evans said the company continues to remain positive on the lithium market.

"The electric vehicle and electric static storage movement continues to gain strong momentum, and with clean energy policies becoming a major priority for governments across the world, lithium will continue to play an integral part in the realisation of these policies," Mr Evans said.

"When we broke ground at the Altura Lithium project 18 months ago, we set an aggressive timeline which would allow Altura to gain a first-mover advantage in this rapidly growing market, and with our Stage 1 operations progressing to nameplate capacity, we are in a strong position to continue to deliver value to all stakeholders of the business."

The Industry Contractor That Delivers

RC Construction WA is a leading West Australian based multi-disciplined concrete and construction company.

The company offers competitively priced formwork, steelfixing and concrete placement packages to both the water, civil, energy and resources sectors.

RC Construction's team of highly qualified Supervisors, Engineers together with experienced tradesmen work tirelessly to deliver all projects in an efficient manner. The company's ongoing commitment to providing a flexible, pro-active approach, cost effective solution to each client whilst keeping safety and quality a priority is the reason for their success to date.

Recently successfully delivered projects include Pilgangoora Lithium Project Stacker and Conveyor structural concrete, Puma Energy Bitumen Plant structural concrete in Kwinana, Dalwallinu 2ML water tank. With current work load including Norseman 4ML water tank, SAMI Bitumen Plant structural concrete in Kwinana aswell multiple processing plant upgrades throughout the Pilbara.



☎ 08) 9206 3664

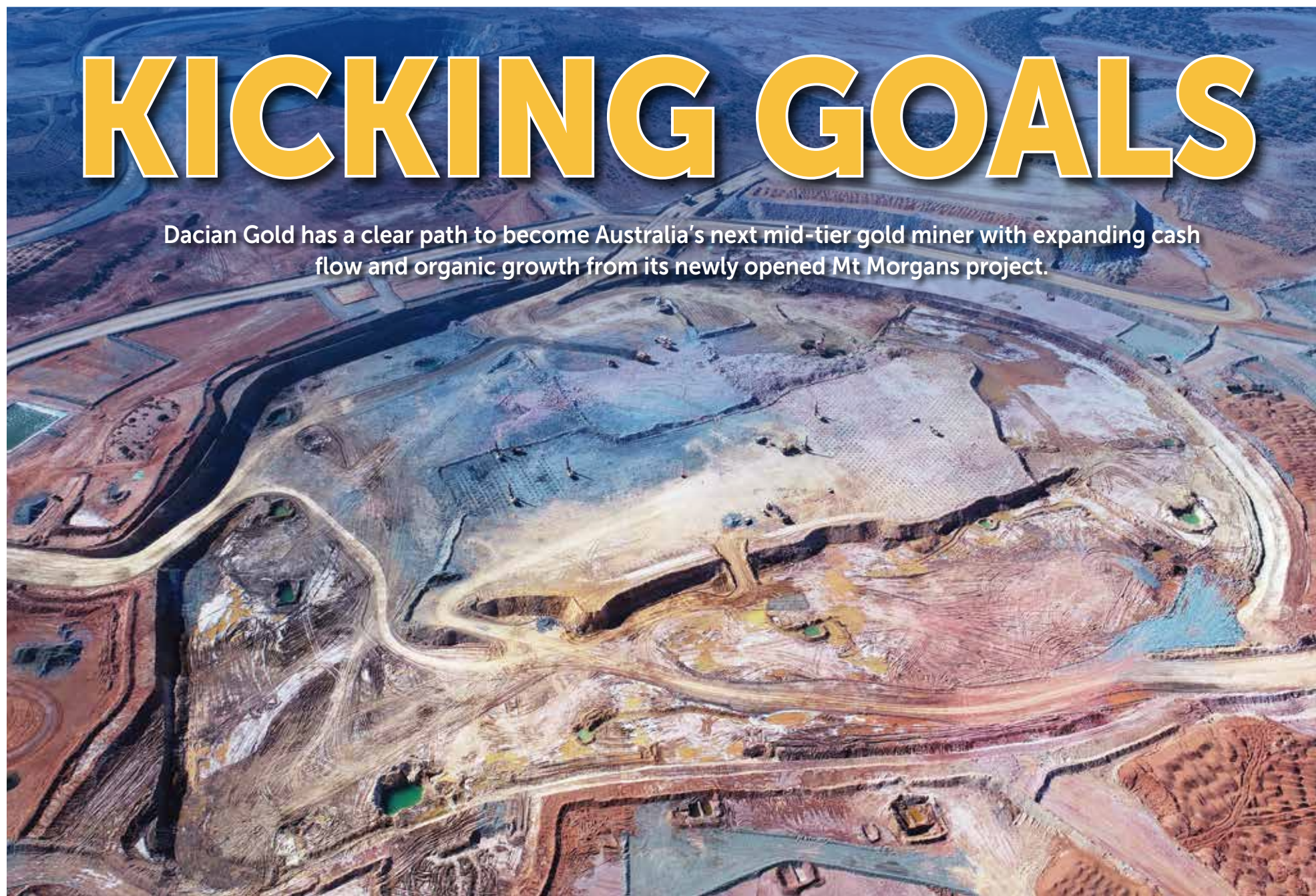
✉ tenders@rcconstruction.com.au

🌐 rcconstruction.com.au

RC
CONSTRUCTION

KICKING GOALS

Dacian Gold has a clear path to become Australia's next mid-tier gold miner with expanding cash flow and organic growth from its newly opened Mt Morgans project.



JESSICA CUMMINS

IN late March, first gold was poured at Dacian Gold's flagship \$200 million Mt Morgans gold project in WA.

It was big milestone for the junior miner; for one Mt Morgans presented Dacian with 200,000 ounces of gold production over a 10-year mine life.

The project also offered organic growth through its mining centres Westralia, a 1 million tonne per annum (mtpa) underground operation; Jupiter, its 1.5mtpa open cut operation; and new discovery Cameron Well.

Dacian Gold executive chairman and chief executive Rohan Williams told *The Australian Mining Review* the project would remain a key focus for the company over the coming years until it was known how big the Mt Morgans gold operation could be.

"It's all about getting to steady state, that's the next big step for us — getting up to our 200,000 ounce run rate — which we believe we can do by the end of this calendar year," Mr Williams said.

"We are very focused on getting to that level."

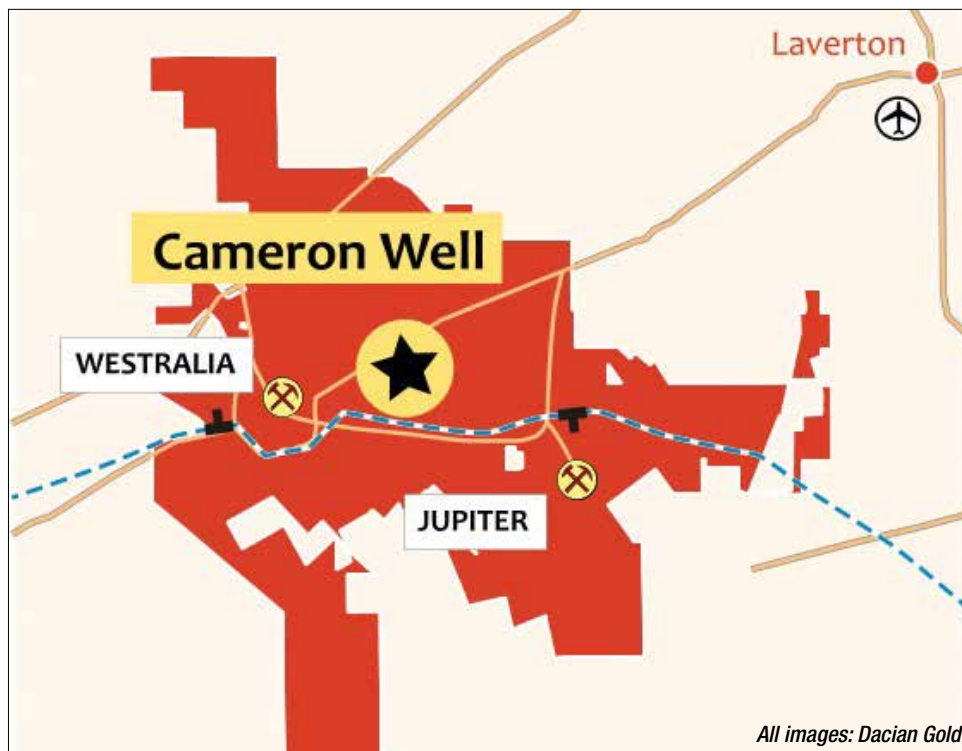
Mr Williams said the June quarter was a great success for the company.

"When we set ourselves a target of producing gold at a particular time and we meet that target then that is a good tick for us," he said.

"When we say we want to produce between 30,000 and 40,000 ounces in our first quarter and we do 34,000 ounces, then that's another good tick.

"I suspect investors are quietly pleased that we are doing what we say we are going to do."

In FY19 Dacian's production guidance was targeting between 180,000 and 210,000oz of gold.



Cameron Well is between the company's Westralia and Jupiter mining areas at Mt Morgans.

Mt Morgans

Dacian acquired Mt Morgans in early 2012 before raising \$20 million in an IPO, which financed three years of exploration.

"We made two discoveries pretty quickly, and then over the next three years we turned those discoveries into producing gold mines," Mr Williams said.

The two mining complexes — Westralia (Beresford and Allanson underground mines) and Jupiter — are 15 km apart.

Dacian's third, undeveloped mining centre, Cameron Well — 9km to the north-west of the company's new 2.5mtpa treatment plant — was also showing promise.

In September 2016, Dacian began the first round of reconnaissance drilling at Cameron

Well, which confirmed it as a large, highly prospective gold target.

Mr Williams said with Westralia and Jupiter up and running, it was "getting back into exploration" at Cameron Well, with the aim of announcing a reserve for the deposit by the end of the calendar year.

"Hopefully it will become our third mine," he said.

Exploration

Mt Morgans is situated among numerous multimillion ounce gold mines within Laverton, the second highest endowed gold district in WA after Kalgoorlie.

"Exploration is important because we believe that the gold field we have at Mt

Morgan's is bigger than what it currently is," Mr Williams said.

"It's incumbent for us, and our shareholders expect us, to determine if our ideas are right.

"We think there is a lot more gold to be found and rather than sit on our hands and do nothing - if we find more gold, that increases the share price and increases value."

During the June quarter, Dacian discovered two thick high-grade intersections — 3.1g/t gold from 59m and 2.6 g/t gold at 96m at Cameron Well.

"The more we drill at Cameron Well, the more we believe we are onto something very substantial here," he said.

The prospective Laverton gold district is known to be home to syenite, which Mr Williams said "is an unusual rock type that contains gold."

"There are very few other places in WA where you find them and there is a real concentration of them in Laverton — Cedar Island on Lake Carey to the south of Mt Morgans is one of them," he said.

"If you have a syenite you have a pretty good chance that you're going to find gold.

"Exploration is never successfully guaranteed but just by virtue of it being a syenite rock type it has the potential of hosting gold — and if we are really lucky Cedar Island might become our fourth mine."

Looking Ahead

Moving into 2019, Mr Williams said Dacian had a two part goal.

"We want to maintain that production level at 200,000 ounces of gold per annum, which will give us the mid-tier status that we are looking for," he said.

"And the second part is to find new ore reserves and look at how to improve share value by bringing them into production."

All images: Dacian Gold.

Delivering Mt Morgans on time, within budget



More information can be found at: www.gres.com.au.

NATIONAL

GR Engineering Services (GRES) is an ASX-listed process design and engineering company providing fixed price EPC and EPCM project delivery services to the mineral processing industry internationally.

GRES recently delivered the Mt Morgans gold project for Dacian Gold (Dacian) having previously completed

the final stage of feasibility study work, which established the viable pathway for development of the project on time and within budget.

The company is proud to have assisted Dacian in the delivery of the 2.5mtpa CIL plant at the project, where ore is primary crushed and milled in an SABC circuit prior to gravity gold recovery and leaching in the CIL circuit.

GRES also delivered the non-process

infrastructure at the project and managed the TSF construction.

GRES has successfully completed feasibility studies, process and engineering designs and construction for projects of various scale, covering a diverse range of mineral commodities.

The company has delivered processing facilities and infrastructure for precious metals, base metals, mineral sands, industrial minerals, tin, tungsten and

iron ore projects for a range of clients in Australia and internationally.

GRES also has a presence in the hydrocarbons industry via its wholly owned subsidiary, Upstream Production Solutions (Upstream).

Upstream is a leading provider of operations, maintenance and well management services to the oil and gas industry in Australian and South East Asia.



GR ENGINEERING SERVICES
ENGINEERING CONSULTANTS AND CONTRACTORS

Proudly supporting Dacian Gold in the successful delivery of the
Mount Morgans Gold Project

www.gres.com.au | +61 8 6272 6000

Image: Boss Resources.

DEVELOPMENT READY

Boss Resources is the proud owner of the Honeymoon project, one of the few Australian uranium projects ready to participate in the early stages of a new bull market. We spoke with Boss Resources managing director and chief executive **Duncan Craib** about the mine's restart plan, technologies chosen for processing, and his outlook for the uranium market in the near-term.

ELIZABETH FABRI

Q. Take us through the re-start strategy for Honeymoon.

In July 2018 the company launched the re-start strategy for the Honeymoon uranium project in South Australia, as categorised into three key phases;

Phase 1: The generation of the final input data required for the DFS including the drilling program to deliver the measured and indicated resource, an optimisation program to deliver further cost savings and/or process improvements and a preliminary execution plan, updated cost estimate and schedule for the re-start of the existing solvent extraction ("SX") plant.

Phase 2: The second phase comprises the DFS and permitting updates.

Phase 3: The third phase covers the detailed execution planning, operational readiness inclusive of the SX plant recommissioning plan, in conjunction with the ion exchange plant detailed design.

Phase 1 is ahead of schedule with the infill drilling campaign our current primary focus, targeting an area of resource located on the existing Mining Licence within close proximity and within well-field pumping distance to the existing processing plant infrastructure.

No further permitting is required to extract resources within this area and accordingly, the initial wellfield operations will be conducted in this area to supply production during the early years of operation.

More than 100 holes have been drilled to date with the initial reported drill results of 50 mud rotary drill holes returning exceptional results (as announced to ASX on 2 August 2018) surpassing our expectations in both grade and thickness of the mineralisation. Hole BIF0044's quality drill result was quite exceptional at 9.5m width at 7,407ppm pU3O8 (70,367 GT), ranking it as one of the best intersections drilled at Honeymoon.

To put it into perspective, our cut-off grade is 250ppm and whilst we could mine at lower grades, there are numerous cost and operational benefits to leaching higher grade material from continuous thicknesses.

Primarily, less ore has to be leached to extract the same amount of contained uranium, which typically results in lower operating costs and increased operating margins.

Q. When do you hope to hit the start button on production?

The Honeymoon mine can respond very quickly to changing market conditions and catch the upside of the market cycle.

The existing SX plant is currently on care and maintenance and can reach a production level of around 880,000lbs per year within a nine month period and, with the addition of the IX plant, ramp up to 2mlbs per year within 24 months.

In general, deliveries under long term contracts commence around 18 months to two years after the contracts are signed, this would allow Boss the advantage of signing term agreements for supply in parallel with taking the decision to move forward with production.

This is a rare advantage for a new producer as in many instances production may start several years after the decision to produce is taken and market conditions may have changed significantly.

Sustainable long-term prices above US\$40 - \$45/lb would be a trigger to draw the Board's attention to a decision to start production.

Q. Take us through your decision to incorporate a \$US58m ion exchange circuit into the processing plant?

Like Honeymoon, more than 50 per cent of the world's uranium is mined by in situ leach methods, also known as in situ recovery (ISR), which is seen as the most cost-effective and environmentally acceptable method of mining, and other experience supports this.

Once the pregnant leached solution is pumped from the ISR production wells to the treatment plant the uranium can with be recovered by a resin/polymer ion exchange (IX) or by an liquid ion exchange (solvent extraction – SX) system.

The IX system however is the preferred processing option, accounting for the vast majority of ISR operations due to its comparably low operating and capital costs.

Boss Resources' company-making identification of an optimal resin to support IX production for Honeymoon followed extensive laboratory test work in 2017 with ANSTO.

To provide further technical validation the company conducted a highly successful Field Leach Trial in July to November, during which the modified leaching regime produced

significantly higher uranium tenors than had previously been achieved at Honeymoon. The IX pilot plant also performed exceptionally well, delivering the key technical validation step on recovering uranium efficiently from real leach liquor.

The outstanding Field Leach Trial results justifies the decision to pursue Ion Exchange and its significant potential for economic upside being the most efficient, lowest risk and lowest cost method of processing uranium.

Another key advantage of the IX process is that it can be utilised on isolated orebodies where a satellite plant can be set up if the central process plant is too distant.

Essentially a facility is established to load the ion exchange resin/polymer so that it can be trucked to the central Honeymoon plant for further processing. Hence isolated orebodies can become viable, since apart from the wellfield, little capital expenditure is required at the mine site.

Q. How close are you to securing offtake agreements, have you fielded many sales enquiries to date?

The market is still a buyer's market though there are positive signs of upward price movement in the spot and term markets. Boss has been responsive to buyers' requests for proposals for supply and had been in informal discussions with potential off-takers.

We have a clear price objective in mind and while it is higher than current market expectations we are well within the range of expected near term price movements. We are unable to disclose any details as any discussion are confidential.

Q. If the US decides to introduce tariffs on uranium imports, how (or will) will this impact Honeymoon?

At this stage it is too early to know what form, if any, restriction on imports to the US will take. Australia has been a long-standing, reliable and responsible uranium supplier to the US and in 2017, US nuclear utilities purchased almost one-fifth of their requirements from Australia. The focus of concern for the US petitioners appears to be on supply from state-owned companies which is not an issue for supply from Australia. We will continue to monitor these developments closely. The US is a very important market

for us but one shouldn't forget that just under two thirds of world demand is outside the US.

Q. What is your outlook for the uranium market Are you confident prices will improve?

Yes, we are confident that price will improve and it is increasing having reached \$US27/lb.

Demand is growing especially in China, India and Russia, we are seeing emerging nuclear nations such as Saudi Arabia and more reactors restarting in Japan. Even prior to the recent cutback in uranium production in Canada, Kazakhstan and Africa due to unsustainably low prices, industry forecasts showed a need for new uranium production in the early to mid-2020s; cutback to production has brought that deadline forward.

To bring existing production back on line and encourage development of new production in time to meet demand prices will have to rise significantly several years prior to when production is needed.

We are already seeing signs that the market is tightening. For many of the new mines a sustainable price would be in the \$US50 to 70/lb range.

Q. Final thoughts?

Since Boss Resources' acquisition of Honeymoon in December 2015, we have progressively de-risked the project both technically and commercially to the point where on completion of the re-start strategy, we will be ready to execute the programs of work required to restart Honeymoon assuming a specified uranium price has been achieved to satisfy the targeted IRR and NPV return to maximise shareholder value.

The project is fully permitted with a 3.3mlbs pa export licence and existing plant an infrastructure invested at over A\$170m.

Honeymoon can be brought back into production in a mere 12 months, and being an ISR mine in combination with IX production, would rank as one of the lowest cost producers world-wide.

Furthermore, there is significant exploration upside with a target of between 32Mt to 78Mt at a grade of between 450ppm and 1400ppm U3O8 with a potential target endowment of between 42Mlb and 100Mlb of contained U3O8.

INDUSTRY SPOTLIGHT

COMPANIES GEARING UP

Aussie's Mine Boss range leads way

NATIONAL

THE inspiration for Australian Pump's (Aussie Pumps) range of Aussie Mine Boss trash pumps came from the industry itself.

Both infrastructure and operational conditions dictates that only the strong survive.

Mines can't tolerate downtime, particularly if it's generated by equipment that isn't designed for those conditions.

"Nobody ever heard the words 'go easy on that trash pump, Kevin' on a mine site," Aussie Pumps' chief engineer John Hales said.

Seeing the way commercial style product is used on mine sites led to the evolution of products that are not available from either a US or European manufacturers.

What Mr Hales realised early in the piece, was that on Australian sites, nobody will ever pick up a pump and carry it.

Site OH&S rules are stringently enforced.

If a pump needs to be moved, an excavator or other piece of machine will pick it up by the frame, take it where it

needs to go and drop, often not too gently, into the new location.

The result is offshore built trash pumps ending up looking like train wrecks.

Aussie Pumps developed the Mine Boss range to be stronger, tougher and better able to deal with those onerous needs.

Aussie's 2", 3" and 4" pumps all offer front opening ports to enable the pump to be cleared, without breaking pipework or dismantling hoses.

They feature heavy duty, high SG, non-clog open impellers and cast iron volutes.

Silicon carbide mechanical seals are standard.

The big advantage over conventional self-priming site pumps is not just the big open impeller but the front opening port.

With that open, chokes can be cleaned out from the belly of the pump in a matter of seconds.

Another benefit is that no special tools are required and more importantly, there's no necessity to disconnect hoses or pipework.

That is a huge advantage on a mine site.

Aussie's 2" through to 4" pumps all come with super heavy duty 3/8 ml galvanised

steel frames with an integrated lifting bar.

A fire extinguisher, battery isolation and E-Stop are all standard equipment on Aussie's Mine Spec pumps.

The company has even developed a trolley mounted configuration for the 4" pump.

The trolley mount comes with a bunded tray.

Bigger 6" trash pumps are also part of the Mine Spec range from Australian Pumps.

These pumps will deliver a whopping 6000 lpm flow and offer heads of up to 47.6 metres.

Their suction lift is also impressive.

Like the smaller pumps, they will draw water through a vertical lift of up to 7.6 metres.

"We call our self-priming trash pumps 'Quik Primes'," Mr Hales said.

"That's because they draw water faster and further than any conventional self-priming pump."

The big 6" pumps are powered by either Deutz or in the smaller version, a Kubota three cylinder water cooled diesel.

"Both brands of engines were selected

for their reliability, even under the most adverse conditions," Mr Hales said.

The machines are available with heavy duty trailer configurations.

The 6" Mine Boss kits include fire extinguisher, E-stop and battery isolation.

The big 6" diesels also feature engine protection kits and big fuel tanks that allow up to a full 11 hours run time.

Integrated lifting bars are also fitted even for the trailer mounted units.

"We owe the ideas incorporated in these 'bullet proof' machines to the feedback we got from the users," Mr Hales said.

"Here even at our Sydney office, we have a steady progression of people visiting Sydney from mines as far away as Kenya, PNG and of course from all around Australia.

"Our doors are always open and we're always ready to listen."

The company also has staff scouting mines around the country on a regular basis for ideas, problems to be solved, and lessons to be learnt.

Further information on the Aussie Site Boss trash pump range is available from Australian Pump Industries' website www.aussiepumps.com.au or Aussie's mining partners throughout the country.



Aussie's 3" Mine Boss trash pumps roll off the line at Aussie Pumps.



Aussie's big 6" trash pump produces 6000 litres per minute – that's 36,000 litres per hour.

Boost for switchboard industry

NATIONAL

STABILITY has returned to many Australian mining companies, with widespread optimism rising from the latest reporting showing the bucking of past trends.

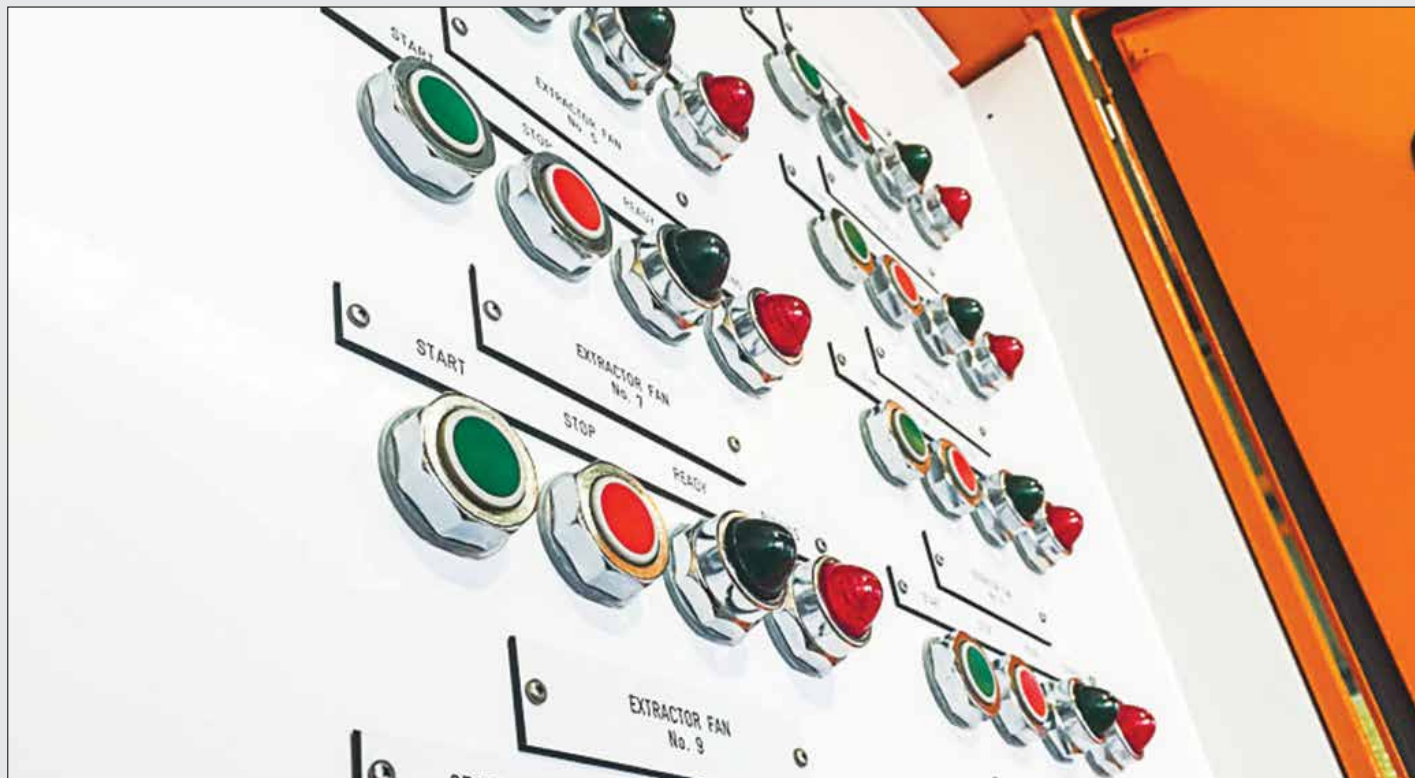
Mining Equipment Technology Services (METS) companies shared this optimism following a long wait and many expect resulting improvements in market conditions.

Switchboard manufacturer DaRa has stood the test of time regardless of market volatilities, factoring in its relentless pursuit in innovation, capacity building and customisation as a hallmark to its growth recipe.

The recent addition of its Cranbourne facility in Victoria stands testimony to its ever-growing customer base, with special emphasis on mining switchboards.

DaRa is an ISO 9001:2008 company with accreditation from leading switchgear OEMs.

As a switchboard manufacturer that values service, DaRa takes its order fulfilment dates very seriously so that its clients can plan their site works with confidence that the switchboards will turn up on time.



More information about DaRa can be found at: www.electricalswitchboards.com.au.

"Unforeseen bottlenecks are part of our supply chain and manufacturing process and we are ready ourselves to deploy all resources to ensure we do not miss

a deadline," DaRa operations manager Yoshan De Silva said.

DaRa's mining duty grade switchboard installations in many WA mines speaks for

itself regarding the trust customers place on its switchboards.

More information can be found at: www.electricalswitchboards.com.au.

ROXON conveyor range reduces costs

NATIONAL

NEPEAN Conveyors has released a new range of mobile and fixed standardised conveyors designed to offer companies high-quality conveyor solutions at reduced costs.

The ROXON range of mobile and fixed standardised modular conveyor equipment consists of radial and telescoping stackers, and light to medium capacity conveyors, which are a perfect fit for all quarries, ports, plants mines and construction activities.

The standard products are pre-designed and can be tailored to meet the demands of various applications and operations.

By adopting the appropriate stacker features and configuration customer stockpiles can be more strategically placed and more quickly processed.

Customers are able to select the new pre-engineered conveyors straight from the catalogue.

Off the shelf conveyors can be quickly assembled at site and come delivered in pre-assembled modules with the main components installed.



Nepean Conveyor's ROXON range of mobile and fixed modular conveyors can be found in mines across WA and Victoria.

Modules can be packed in standard containers, which protect the equipment before installation and allow easy transportation to site and are quick to install.

The mobile solutions in the range offer significant operating cost savings compared to traditional methods of material handling (wheel loaders, haul trucks, static conveyors), as well as providing environmental, health and safety benefits.

In addition, customers benefit from the mobility and flexibility aspect of these conveyor systems; the versatility of the products mean they can be moved to other project sites easily.

All conveyors include a quality management system, which is externally audited by International Standards.

The ROXON Range

Nepean Conveyors' semi-mobile or fully mobile series of ROXON stacker conveyors are one of the most cost-efficient and effective ways of stockpiling material in the market.

They are available in multiple configurations with varying throughput capacities, belt widths and lengths, and can be supplied with radial and telescoping features, and with or without wheels or crawler tracks, making them extremely commercially viable.

The HC100 Belt conveyor is standardised for bulk material conveying with light weight structures designed for safe use and easy maintenance; a simple solution for higher productivity and utilisation.

ROXON's HC200 Link conveyor is a standardised design made for movable conveying applications, and can be easily relocated to another position depending on

the current need.

The HC200 Link individual conveyor length is either 30 or 40 meters.

Then there is the HI100 High Incline conveyor, which is used for steep inclined and vertical conveying, providing an advantage of going up in significantly smaller space and larger angle than traditional belt conveyors.

The HS and HQ Series of fixed, semi-mobile, fully mobile and telescoping stackers are also standardised for quick site installation, and are available in multiple configuration for various stockpile geometries.

Other ROXON projects in the standard range included: Spreading Systems; HF100 and HF200 Belt Feeders; HF400 Movable Belt Feeders; HD100 Apron Feeders; HH100 and HH200 and HH300 Loading Hoppers; HX270 Belt Monitoring Systems; and the HL500, HL700 and HL800 Shiploaders.

World class mining services

NATIONAL

IN 2018, CMI Technical Services has been on a steady rise.

Growing interest for CMI's services, in both fixed plant maintenance and onsite machining throughout the Australian, Middle Eastern and West African regions, has kicked up a gear, which is all too pleasing for CMI's managing director Zeb Ogilvie.

"The shimmering haze of the Middle Eastern division is now our strongest performing region," Mr Ogilvie said.

"It has been one of both patience and

time from all our team members and management involved in the region, which has resulted in the positivity we see today.

"Our clients' satisfaction has and is always CMI's focus."

CMI now has a consistent team of 20 men working in the Middle East region, with shared workshop facilities in Dammam and larger projects in the pipeline into 2019.

CMI's diversification into mobile line boring has also gone up a notch thanks to the professionalism, availability, and quality of workmanship shown to its Australian clients.



More information on its services and products can be found at: www.cmitech.com.au.

CMI has four line boring units available in Australia, and with a capability of 38mm (1.5") to 1500mm (60") bore diameters, there isn't much that can't be achieved.

"Our onsite machining division has really increased thanks to our men operating the line boring units," Mr Ogilvie said.

"Their professionalism is second to none, great quality of work and communication has thus helped foster client relations."

Mr Ogilvie added when clients saw its Climax BB7100 borer turn up to site, they were impressed by its layout

and ease in which personnel can go about their work.

"We have custom designed bearing support mounts which enhance rigidity thus allowing heavier cuts," he said.

"We're able to the big stuff that only a handful of others can offer in Australia.

"In mining, typically it's dragline swing bores or propel bores, or marine requirements during drydock works like stern tubes, transom bores or winch bores.

"Typically, anything over 500mm where the smaller 2 1/4" bar units will struggle."

ROSTA: bigger and brighter than ever

NATIONAL

THE widely known ROSTA range of rubber torsion element products have been providing solutions to the mining, oil and gas industries in fixed, modular and mobile plant — as well as a myriad of other industries — for 73 years.

The ROSTA Australia subsidiary in Malaga, WA, was established by ROSTA AG Switzerland in January 2015 to service the Australia and Asia Pacific region, following many decades of ROSTA product promotion by agents and distributors.

ROSTA Australia's vast stock holding is for the support of its distributor network, OEMs and end-users.

ROSTA Australia staff collectively has more than 50 years of experience with ROSTA products and have seen the development of many solutions from concept to reality.

ROSTA's Main Product Categories

ROSTA Oscillating Mountings offer a broad range of units including AB mounts which are used for screen and feeder suspension for fixed, modular and mobile plant applications in the mining and quarrying industries to replace coil springs, rubber block and airbag systems.

The AB mounts have proven to be reliable and long lasting, even in hostile environments which has endeared them to end users and OEMs alike.

ROSTA Single Pivot MB Motorbases are used for maintaining belt tension on V Belt drives, such as those used on crushers, feeders, screens, fans, pumps and just about any application which utilises V belts. Sizes range from 0.75kW to more than 550kW.

ROSTA ATEX Single Pivot MB Motorbases are suitable for applications



ROSTA products have been a stalwart to the resources sector for decades.

in hazardous areas according to the ATEX 94/9/EC Directive.

ROSTA Superior Lift Motorbases are used in overhead drive applications, and are especially suited to pump drives. These motorbases eliminate the often-used vertical jacking bolt system and makes belt changes safer, quicker and easier as the V belt drive alignment is maintained throughout the motor movement range. As with the company's whole MB ROSTA Motorbase range, there is a noticeable improvement in pulley and V belt life as belt tension is maintained for a longer period when compared to a fixed system.

ROSTA Tensioners for chain drives range from 3/8" pitch upwards.

As well as the standard ROSTA SE type Tensioners, ROSTA produce custom

Tensioners to suit just about any drive application.

ROSTA Anti-Vibration Mounts are used for isolation of vibration and impact from surrounding structures. These are especially useful for absorbing high impact loads on conveyor transfer point applications.

ROSTA Rubber Suspension units are modular components that ROSTA produces in a variety of designs which find their way into innovative engineering designs the world over.

As well as its range of standard products, ROSTA's ability to design, analyse and produce custom rubber torsion elements is second to none.

The company is proud of its products, and quality validation is of the highest

importance.

A well-equipped research and development department leaves nothing to chance; the materials tests that take place before and periodically during production are the guarantees for a comprehensive quality standard – so customers can be rest assured that a spare part element produced in 10 years' time will have the same characteristics as the one supplied today.

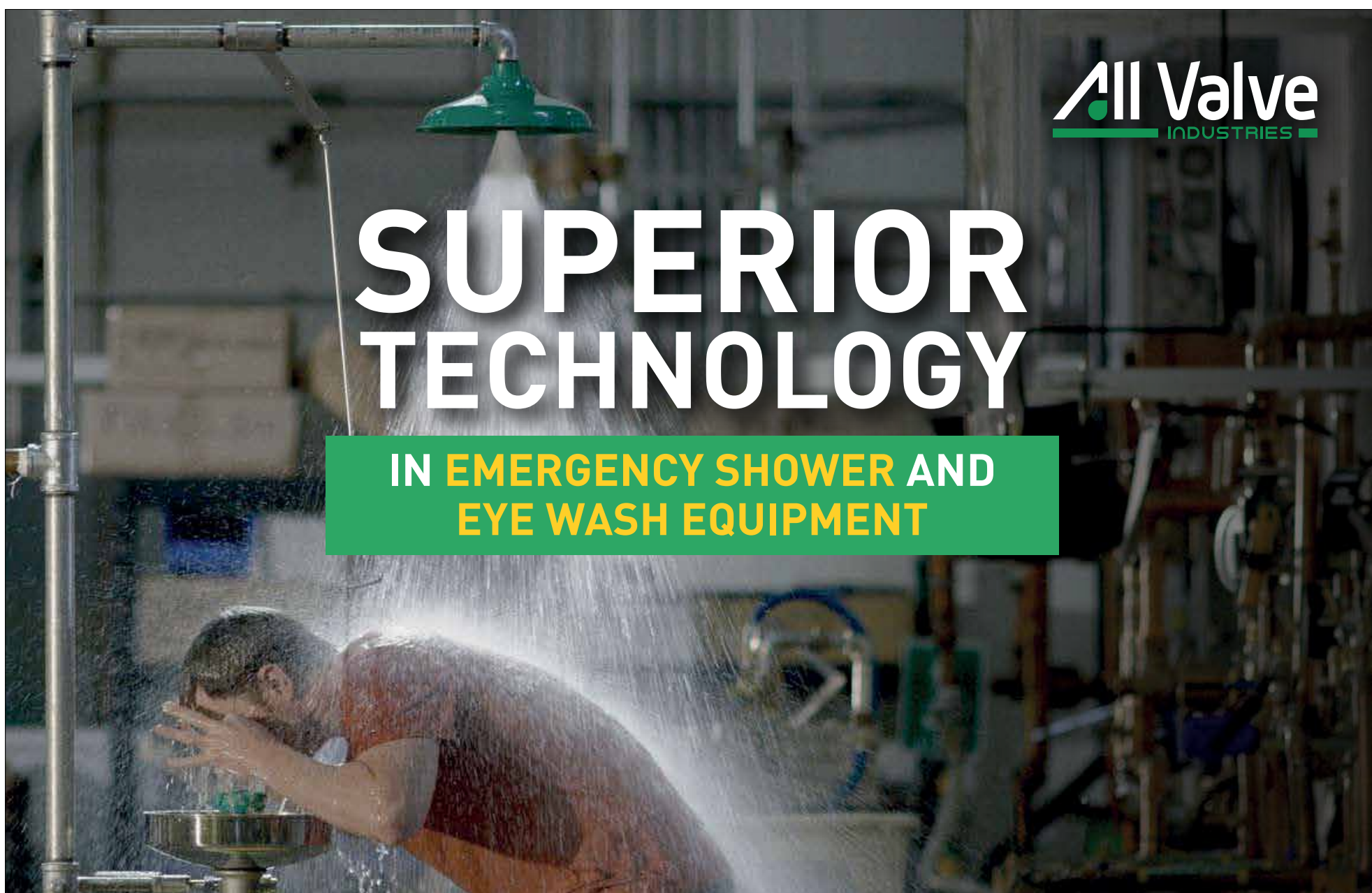
ROSTA is in its element providing customer support and assistance to find a possible solution, independent of the type of industry.

Information regarding contact details, brochures and CAD file downloads of ROSTA products can be found at: www.rosta.com.



SUPERIOR TECHNOLOGY

IN EMERGENCY SHOWER AND EYE WASH EQUIPMENT



DUST COVER FOR HYGIENE

Emergency Safety Showers & eyewash units are subjected to the harshest site conditions with aerated eyewash outlets continually being blocked by dust, and "open" bowls being contaminated with bird and vermin droppings rendering them unusable and unhygienic in many applications.

The Haws model 8300 SS with integral dust cover prevents dust ingress and automatically releases with water pressure, thereby offering a cost-effective solution to this ongoing problem.

LAMINAR FLOW EYEWASH WITH STRAINER

Using non-aerated laminar flow eye/facewash head. The use of aerators in many eye/face wash designs whilst originally recommended for comfort may also pose a potential risk to the user in poorly maintained systems due to the aerosols they may generate from contaminated water which may be inhaled and cause further hazard to the user.

A fully serviceable inline 50 x 50 mesh strainer filters debris from reaching the eye/facewash head.

316SS STANDPIPE

316 stainless steel standpipe supports the bowl and shower head.

COMPLIANCE

Model 8300 SS is fully compliant to AS 4775-2007 & ANSI 358.1-2014 requirements for simultaneous operation.



OPTIONS

- Fluoro or LED lights
- Flow switches
- Beacons / Alarms
- Scald Protection
- Wireless Monitoring
- AS1319 compliant signage
- Optional foot treadle

Leading valve solutions

NATIONAL

ALL Valve Industries is a specialist supplier of emergency shower equipment, industrial and waterworks valves, water metering solutions and monitoring systems.

In conjunction with its globally recognised manufacturing partners, the company services a diverse range of industries including mining, chemical, oil and gas, waste water treatment, defence and marine.

All Valve Industries provide clients with industry leading emergency shower innovation and delivers solutions for extreme conditions and environments.

The technical development and support to meet the challenges of its clients industry is unrivalled as is its knowledge, with its team having also played a leading role in creating the Australian Standard AS4775 and direct input into the European Standard EN15154 (Part 1 and 2), and the American National Standard ANSI Z 358.1 -2014.

Every mine site is subject to a unique combination of operating demands and climate conditions.

These site - specific conditions translate to distinct system requirements for each site.



More information can be found at www.allvalve.com.au.

Haws Integrated applies a unique combination of engineering expertise (hydraulic, power, thermal and instrumentation), project management

and safety response knowledge to optimise the system attributes and operational functionality throughout the entire asset lifecycle.

With a broad range of hazardous chemicals and chemical by products ranging from potassium cyanide (KCN) to dimethylmercury (C₂H₆Hg) present at many mining sites, providing effective safety and drench systems is absolutely essential.

The Haws Model 8770.25 (1721) self-contained gravity fed tank shower has been purpose built for the mining sector and has been engineered to maintain its structural integrity and functionality in accordance with AS4775 – 2007; wind load rated - AS1170.2.2011 to 88m/s cyclonic wind speed, region D, importance level 4; and seismic designed to AS1170.4 – 2007: Category D.

Constructed of paint protected (RAL 6029) galvanised steel and bright yellow chemically resistant elastomeric waterproof side panels, this unit contains a 1628L overhead storage tank with integrated temperature gauge.

AXION MSR eye/face wash and hydrodynamic showerhead technology delivers 15 minutes of flushing time in accordance with AS4775 and ANSI Z358.1.

Additional standard fittings integrated into Model 8770.25 (1721) include superior response technology, mariotte syphon valve for constant flow rate delivery, pull handle or push bar shower operation, walk on foot grate and much more.

Structural steel partner of choice

NSW, QLD

HARD BAKKA is a results oriented player when it comes to providing steel structures for ore sorting machines for the mining industry.

With more than 20 years' experience in the steel fabrication and welding industry, the founders of the business – Mona and Aladdin – have accelerated the growth of the company significantly in just four years.

The multi-disciplinary company is now one of NSW's recognised names in steel fabrication, specialising in heavy engineering and steel construction, with a solid reputation for problem solving, reliability, quality and an on-going commitment to safety.

In 2018 the company tripled in size, and now operates from a 1000sqm, fully equipped warehouse in Fairfield East, NSW.

"We are strategically located between all major growth areas in the Sydney Metro, which has enabled us to successfully deliver steel structures all around NSW," HARD BAKKA general manager, Mona Hwalla said.

"We also supply steel structures and



More information can be found at www.hardbakka.com.au.

platforms for the QLD mines."

HARD BAKKA's services include producing shop drawings, fabricating, surface finishing, deliveries, trial assemblies and onsite construction supervision, to ensure a trouble-free assembly of the complete plant.

The highly qualified team liaise with architects, engineers, surveyors, shop detail drawers, builders and primary

contractors to produce exceptional results, every time.

"Our clients include tier 2 and 3 construction and resources companies; Government departments, including defence; as well as builders and developers," Ms Hwalla said.

"We also have alliances with the Australian Steel Institute and Master Builders Association.

"We approach your project with care to your pocket, your mind, and your time, and from this set of values, we build lasting relationships.

"We will always be your friend in the industry and partner on the job."

The team at HARD BAKKA are ready to take on all structural steel projects and are offering a free quote.

Leaders in brute force vibrators

NATIONAL

AS anyone involved in the mining and extractive industries will say, good quality and well-engineered equipment is a necessity.

In the majority of cases, the best way to achieve that is by using purpose-built specialist vibration equipment.

Whether it's on a screen, feeder, separator or perhaps a bin, silo or chute, most equipment in harsh and often demanding environments requires excellent reliability and robustness.

Oli Vibrators are built with heavy duty ductile cast iron with superior bearings and are IP66 rated to International Standards.

Part of the global WAMGROUP & WOLONG Motor Group, OLI Vibrators Australia is a leading supplier of brute force vibrators for mining and the extractive industries throughout the world.

As a global leader in vibration technology, the name OLI has been



More information can be found at www.olivibrators.com.au.

synonymous with expertise in vibration technology for more than 60 years and is known for its price to performance ratio, second to none.

"For OLI, it's always been about quality," OLI Australia general manager Mark Thompson said.

"Manufacturing high quality

products, and delivering the best solutions to meet the customer's specific needs.

"Product performance and reliability – whether out on site or in the processing plant – it is of paramount importance, especially when it comes to mining and quarrying.

"There's a limited timeframe to work in, and our customers need to know that the equipment will be working as it should, when they need it."

From its "Super Big" to the very small electric vibrator range through to pneumatic and flow aids, OLI has the vibration solution to meet every need.



THE WORLDWIDE LEADER IN VIBRATION TECHNOLOGY

PROVEN RELIABILITY

over **260,000** products sold in a year

more than **10,000** active customers

in more than **50** countries through direct subsidiaries

in **5** continents with **1** supplier

COMPLETE RANGE OF ELECTRIC
MOTOVIBRATORS AND
PNEUMATIC VIBRATORS



OLI VIBRATORS

Factory 4, 3 Gatwick Road, Bayswater VIC 3153, Australia

TEL +61 3 8761 6911 FAX +61 3 8761 6922

www.olivibrators.com.au

Avoid downtime with Rock-breaker solutions

NATIONAL

A CORRECTLY sized hydraulic rock breaker and suitably positioned boom system are well-recognised, safe and reliable solutions that can maximise the productivity of any crushing circuit.

However, before purchasing a new rock breaker boom system, it is important to consider four critical factors to maximise the return on investment and ensure optimum performance of the new boom system.

Firstly a hydraulic rockbreaker must be correctly sized by considering all aspects of the application, including rock hardness, rock size, expected duty and the space available.

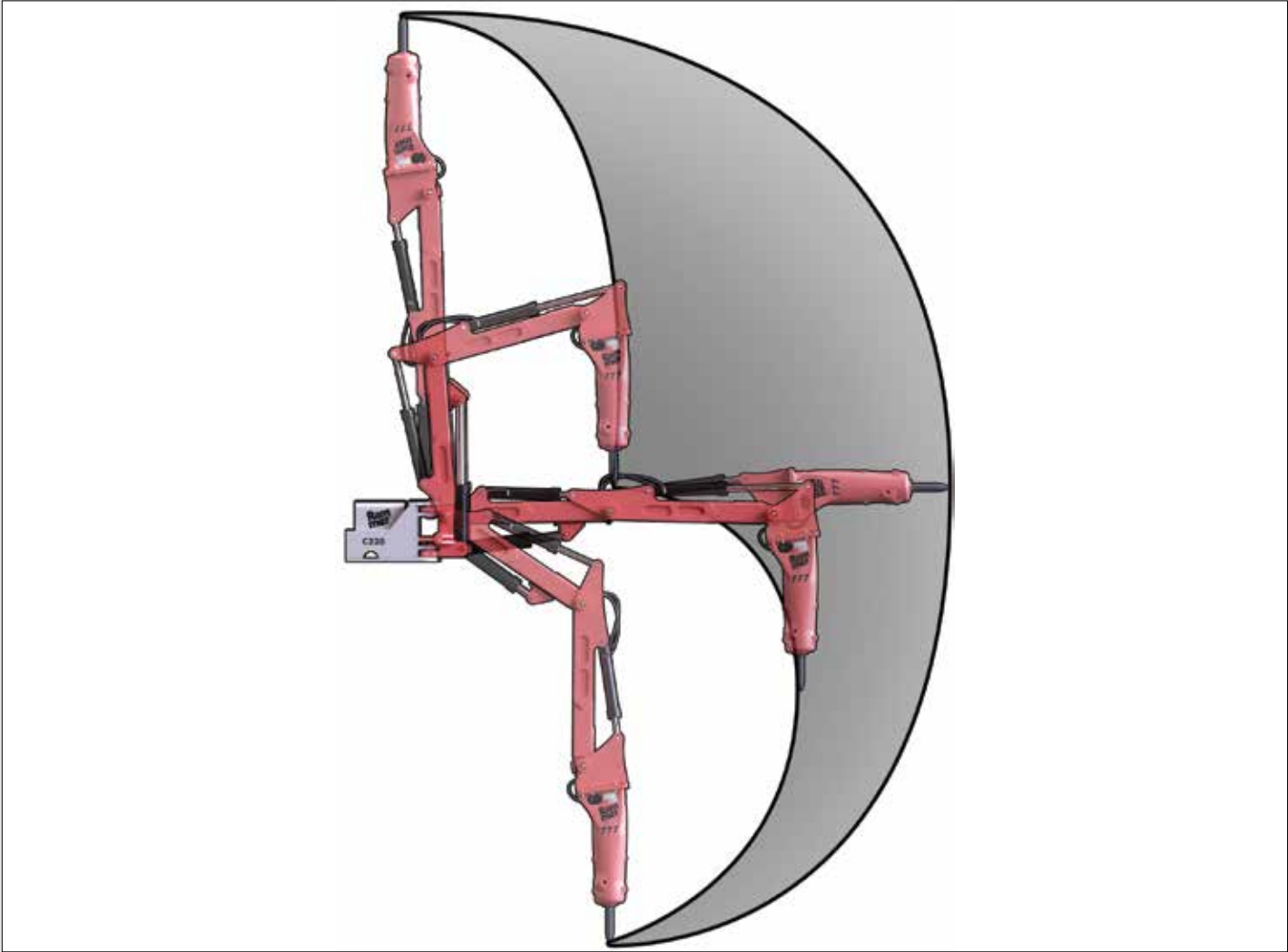
The boom size and reach must be correct to carry the weight of the chosen rockbreaker and meet the reach requirements for the application.

Correct position, elevation and working slew angle of the boom system can make a big difference to the useability and maintainability of the system.

The boom system has advanced safety systems, automation and remote operation options available to increase safety and efficiency.

Total Rockbreaking Solutions engineering manager Paul Ingleson said the company helps customers take advantage of the extensive Rammer product range by selecting the right boom and rockbreaker for the job.

The company package this with the correct controls and power pack to match client requirements, and work with



More information can be found at www.totalrockbreaking.com.au.

customers to optimise the installation to ensure reliable operation and maximum productivity and serviceability.

“We can also assist customers to optimise the operation of their Rammer Boom System by providing integrated control system

options to increase efficiency and safety, and reduce cycle times and downtime due to Rockbreaking,” Mr Ingleson said.



RAMMER HITS CONSISTENTLY HARDER

Reduce breaking times and maximise productivity with Rammer.

Features such as sealed high pressure Membrane Accumulator, Rammer's patented Fixed Blow Energy operating principle, RamData, Automatic Lubrication system, Idle Blow Protection and effective Dust Suppression ensure that every impact is at maximum power.



ROCKBREAKERS | ROCKBREAKER BOOM SYSTEMS
MULTIPROCESSORS | SCRAP SHEARS | GRAPPLES
CUTTER CRUSHERS | ROTATING & STATIC PULVERIZERS

AUTHORISED RAMMER AGENTS IN AUSTRALIA

VIC / TAS
Walkers Hammers
(03) 9315 3788
walkershammers.com.au

NSW
Groundtec Equipment
(02) 9642 2030
groundtec.com.au

QLD / PNG
Precision Screen
(07) 3271 4155
presicionscreen.com.au

SA / NT
Renex Equipment
(08) 8345 0555
renex.com.au

WA
Total Rockbreaking Solutions
1300 921 498
totalrockbreaking.com.au

Ideally positioned commercial office space

WA

MINUTES away from Curtin's School of Mines Bentley campus and CORE Innovation Hub, 21 Teddington Road in Burswood is ideally situated to leverage off renewed growth in WA's mining sector.

Occupying 2233 square metres of building space, the two level commercial building has a number of tenancy opportunities available to suit various corporate requirements.

This includes multiple ground floor options and one full floor tenancy option on level one.

It is close to main arterial roads for the CBD, Perth Airport and several key business and industrial precincts such as Osborne Park, West Perth, Canning Vale and Welshpool.

This makes it ideally suited logistically to mining, engineering and transport companies.

21 Teddington Street is also walking distance to both Victoria Park and Burswood train stations, a bus port and Victoria Park's numerous cafes and restaurants, providing great access and amenities for staff and clients.

Fitted out with optic fibre reticulation VOCUS and NBN, the building is well-equipped for various technological requirements.

The large floor plate of the building allowed for the installation of 347 solar power panels, providing 90 kilo watts of power, meaning tenants will be protected



More information can be found at www.ahi-carrier.com.au.

from energy price hikes in the foreseeable future.

It has a National Australian Built Environment Rating System (NABERS) of 3.5 stars, though this was expected to increase dramatically when fully occupied.

The building's amenities include 12

storage rooms at the basement level and 56 car bays, which do not attract a city parking per bay levy.

End of trip facilities include bike racks and showers.

The building has a large entry with an impressive atrium and glass elevator, and

also has excellent disability access.

Signage rights were also available.

21 Teddington Street is professionally managed by JLL.

More information can be found at: www.21teddington.com.au.

THE AUSTRALIAN
MINING REVIEW

PROFILES FOR NOVEMBER 2018

2nd Hand Equipment
Asset Management
Cables & Cabling
Fatigue Management
Hazardous Waste Management
Industrial Recycling
Industrial Scales & Weighing
Industrial Tanks & Storage
Lab Services
Patent Attorneys
Pest Control
Plumbing Services
Tank Relining & Repairs
Underground Safety Solutions
Underground Wi-Fi Communications
Vehicle & Machine Wash Down Systems
Weather Stations
Wireless Mesh Solutions

CALL US TO BOOK YOUR PLACEMENT TODAY

BOOKING DEADLINE: **October 5th 2018**

BRAD FRANCIS

☎ (08) 6314 0303 📞 0405 345 312

✉ brad@miningoilgas.com.au

SMALL AND SMART



Single Fan MiNi VRF Apartment ready



Introducing Toshiba's advanced Single Fan MiNi VRF. Its small size and light weight makes it ideal for apartment developments, allowing for style and plenty of balcony room. Complementing the range is the Super Slim Ducted providing solutions to a variety of application challenges.

Single Fan MiNi VRF

- Connects up to 6 indoor units for design flexibility including 450mm deep slim ducted and the full VRF unit indoor line up
- Toshiba's efficient and reliable twin rotary inverter compressor
- Lighter and more compact for easier installation and transportation
- 4 models including 8kW, 11.2kW, 14kW and 15.5kW
- Maximum height of only 910mm per unit

Super Slim Ducted

- Compact design 210mm x 450mm deep across the range
- 12 models ranging from 2.2kW to 8.0kW
- Ideal for bulkhead installations above wardrobes in bedrooms
- Lightweight 16kg
- Built in drain pump
- BMS compatible

For enquiries contact 03 9556 0134
Go to toshiba-aircon.com.au

TOSHIBA
AIR CONDITIONING



CATERPILLAR®

KOMATSU

LIEBHERR

SANDVIK

Atlas Copco

TEREX

HITACHI
Inspire the Next

Mining Auto Air Conditioning Sale & Services

SIGMA Rencool™



- Supply and Sale of all mining mobile equipment genuine auto air conditioning parts
- Supply of SIGMA and RENCOOL air conditioning system parts at competitive pricing
- Installation, maintenance, service and repairs of all mining auto air-conditioning systems by experienced mining refrigeration mechanic technicians

ARC
CERTIFIED
LICENSE AU 41694

☎ 0412 228 671 ✉ info@autotechmining.com.au 🌐 autotechmining.com.au

The most slim and quiet Toshiba unit

INTERNATIONAL

TOSHIBA'S Super Slim Ducted (SSD) air conditioner provides solutions to a variety of application challenges facing today's residential and apartment style living, including commercial, hotel, and aged care installations.

The SSD's built-in features and control logic is a perfect fit with building management systems, and has an impressive range of 12 capacities from 2.2kW up to 8.0kW.

The SSD's low profile of only 210mm and 450mm depth makes bulkhead, and installations above wardrobe voids a practical solution in today's smaller living areas.

With installation design ease and user comfort in mind, the SSD comes with its own built-in DC driven drain pump and optional left/right drain discharge ports.

The "Z-shaped" heat exchanger arrangement and DC dynamo operated centrifugal fan, air intake and discharge can be interchanged to either rear or bottom configuration, all combining to produce quieter operation for enhanced user comfort and installation simplicity.

Complementing the SSD is the Single Fan MiNi VRF outdoor unit; small

in size and light in weight, making it ideal for the booming apartment developments right around the country.

This is where the Toshiba Single Fan MiNi VRF outdoor unit comes to the rescue.

Inspiration for this product was sourced from the end consumer's desire for an apartment that has style and plenty of balcony room.

The Single Fan MiNi VRF connects up to five indoor units and features Toshiba's remarkable twin rotary inverter compressor.

Delivering stable performance and with generous energy efficiency plus minimal friction, this is an ideal team for the ultimate in design flexibility and sound-sensitive applications.

There are four models in the range, with capacity covering 8kW, 11.2kW, 14.0kW and 15.5kW.

All outdoor units have a space saving maximum height of only 900mm/910mm per unit, which makes them ideal to place on a balcony.

As with all Toshiba air conditioning products, they are easy to install, feature low maintenance requirements and boast a five-year warranty, for year-round satisfaction and peace of mind.

Expert auto air-conditioning services

WA

WA-BASED mining auto air conditioning company, AutoTech Mining, specialises in designing, installing, maintaining and servicing auto air conditioning systems for all mining mobile earthmoving machines.

The company offers preventative HVAC maintenance service plans as well as high-quality repair services by experienced technicians for onsite yearly maintenance.

It also supplies Sigma, Rencool and all genuine parts for mining machines such as Caterpillar, Hitachi, Liebherr, Sandvic, and Atlas.

AutoTech has established trustworthy relationships with engineers and mining planners, while improving its liability, availability and reducing downtime due to unscheduled service needed on critical equipment.

The company understands the need to keep equipment moving within the mining industry and how to minimise unscheduled downtime due to HVAC system problems.

Auto Tech improves liability and availability of all machines onsite by



More information can be found at
www.autotechmining.com.au.

offering anti idle auto air-conditioning systems for trucks and auxiliary machines especially dozers to reduce service and fuel cost.

The company also replaces Hitachi digger air conditioning with Sigma to eliminate the need of replacing evaporators every year and reduces the number of service and maintenance activities performed.

It also supplies Rencool air conditioning parts for atlas viper drill at competitive pricing and after sales service as well as air conditioning parts such as compressors, evaporators, and condensers for all mining machines.

Yearly maintenance services includes hose making, supplying parts and professional refrigeration mechanic labours onsite.

Collaborating to optimize the design of your equipment and deliver outstanding performance

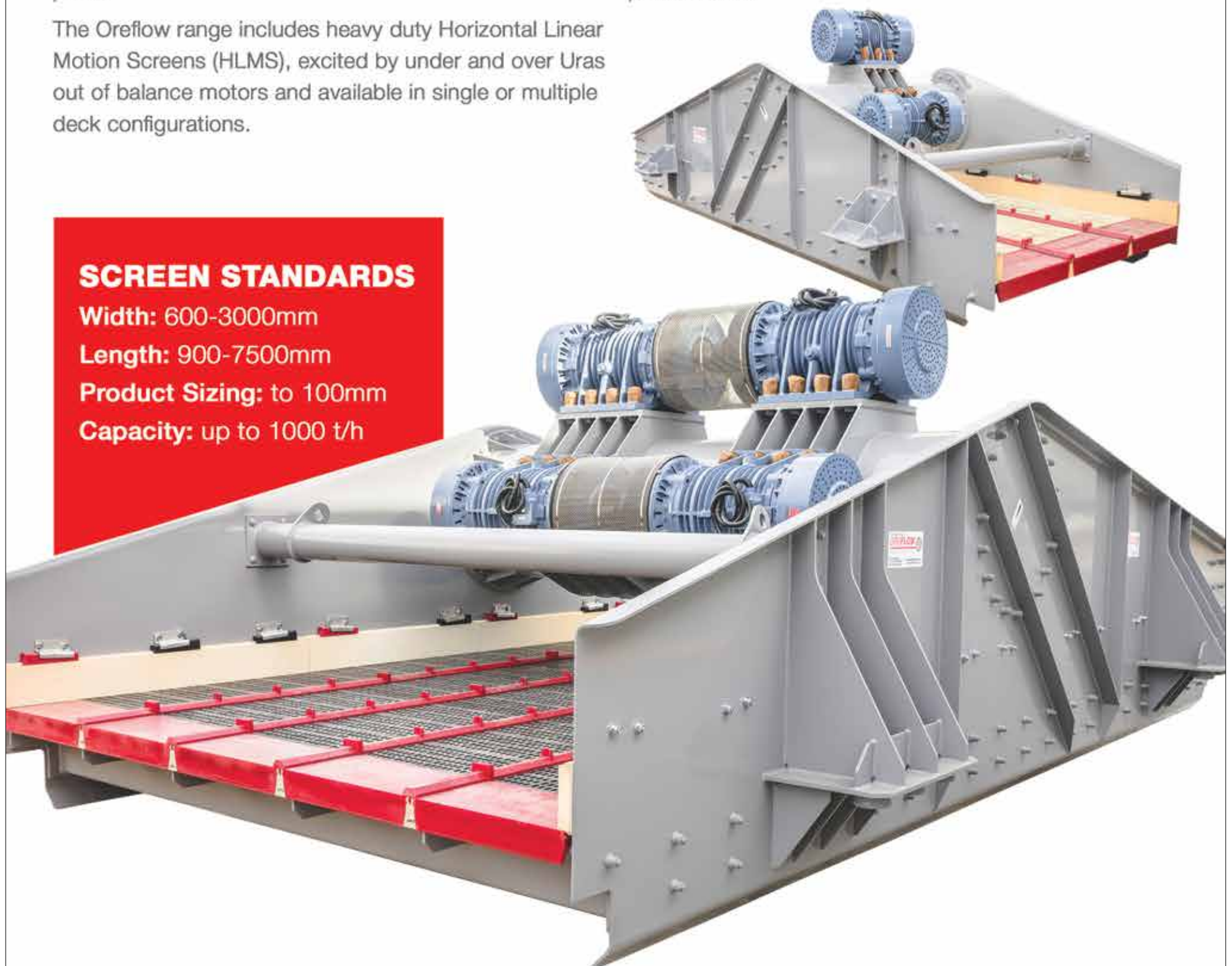
We supply quality capital equipment both in Australia and abroad, specializing in bulk materials handling and processing plant design and manufacture.

Our products are designed to be fit for purpose, capable of operating effectively in even the harshest conditions and able to be integrated into new or existing plant.

The Oreflow range includes heavy duty Horizontal Linear Motion Screens (HLMS), excited by under and over Uras out of balance motors and available in single or multiple deck configurations.

Customized operating parameters ensure accurate sizing and high quantity processing of materials ranging from ores and rock to mineral sands.

Our fully assembled screens are widely used in Australia and around the world due to their ease of installation, low maintenance requirements and exceptional performance.



SCREEN STANDARDS

Width: 600-3000mm

Length: 900-7500mm

Product Sizing: to 100mm

Capacity: up to 1000 t/h



Scan for website

Follow us on [LinkedIn](#)
[linkedin.com/company/oreflow-australia-pty-ltd/](https://www.linkedin.com/company/oreflow-australia-pty-ltd/)

OREFLOW

AUSTRALIA PTY LTD



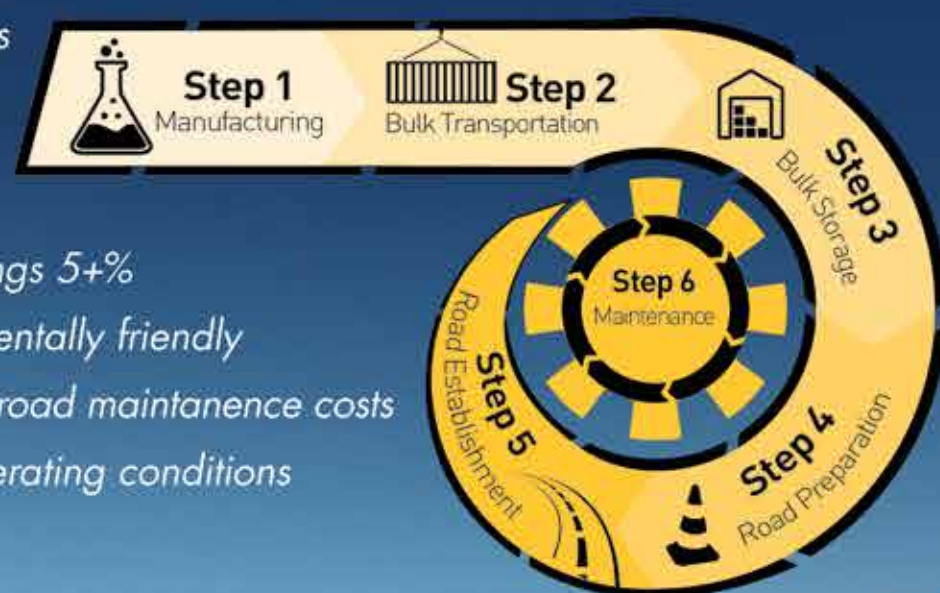
+61 8 9472 0800 | capitalsales@oreflow.com.au | www.oreflow.com.au

Why buy a product when you can invest in the proven solution?

Dust-A-Side is Australia's leading provider of haul road management solutions for mining.

We do far more than sell dust suppression products like so many in our industry. Our full service business model incorporates the establishment, maintenance and management of haul roads.

- > Water savings 90+%
- > Tyre savings 7+%
- > Reduced resheeting 90+%
- > Productivity increase 1+%
- > Fuel savings 5+%
- > Environmentally friendly
- > Reduced road maintenance costs
- > Safer operating conditions



Book your free on-site inspection and preliminary report.

1800 662 387 australia@dustaside.com.au / www.dustaside.com.au



DUST-A-SIDE
AUSTRALIA

Reducing the cost of haul road ownership

NATIONAL

HAUL roads can feel like a bottomless pit of expenditure for miners.

The trouble with haul roads is that most mines see them as only temporary, or at best semi-permanent, so roads are often built in a hurry, with minimal expertise, and a lot of shortcuts taken to bring them into budget.

As many mines have experienced firsthand, a poorly designed road will ultimately lead to premature failure, resulting in exorbitant maintenance and operational costs.

Furthermore, when building or repairing roads, the impact of short-term decisions upon the long-term operating costs are often rarely captured or understood.

As Australia's leading provider of haul road management solutions, Dust-A-Side provides a unique, turnkey solution for haul road management.

Dust-A-Side Australia general manager Neil Hoskin believed many mines have not yet grasped the importance of implementing an integrated solution for managing haul roads.

"Think of a haul road as a living thing. Operating conditions can change from day to day," Mr Hoskin said.

"Haul roads require a holistic approach to management and maintenance. There is no one-size-fits-all solution. If you do not do things correctly, then your operating costs are going to soar and your productivity levels are going to plummet."

To help mine operators maximise the long term value of haul roads, Dust-A-Side has developed a revolutionary haul road condition monitoring and reporting software system called DASMetrics.



Dust-A-Side's DASMetrics haul road condition monitoring and reporting software system.

DASMetrics has been developed in conjunction with industry-leading experts who specialise in enhancing mine productivity.

It incorporates a scientific auditing process designed to ensure the continuous improvement of haul road quality as well as reduce the cost of road ownership.

Using state-of-the-art technology, the system remotely monitors, captures and reports on defects found on haul roads.

The system is customised for each mine site and provides a real time web based dashboard which allows users access to haul road conditions and reporting data

at the push of a button.

The report shows a clear picture of the state of every haul road throughout a mine site. Management can then use the system to assign repair tasks to workers.

The real power of DASMetrics is derived from the algorithms built into the system that quantify the true value of the haul road conditions observed.

By reporting upon the real impact that haul roads in poor condition are having upon the likes of fuel, tyres and productivity, it means that mines are able to make more informed decisions about how best to enhance their operation.

Mr Hoskin said DASMetrics actively allows mines to achieve long-term haul road optimisation.

"By using the system to make incremental improvements, haul road conditions are more efficiently maintained," he said.

"These continuous improvements lead to the likes of faster haul road cycle times, reduced water and fuel consumption, improved vehicle component life and reduced maintenance costs.

"It also means that we can benchmark haul road conditions on any mine site against global best practice."



IN THE SPOTLIGHT

MATSA
RESOURCES
EXECUTIVE
CHAIRMAN
**PAUL
POLI**

page
63

Take the guess work out of grader allocation with Proof Engineers' Road Condition Monitor.



The Road Condition Monitor (RCM) is a real-time maintenance management system used by mine sites to monitor road conditions, prioritise maintenance works, improve operational efficiencies and lower the cost per tonne hauled.

Using our proprietary algorithms, the RCM system accurately provides full site mapping, showing the quality of road sections in a simple colour scale format. The distinctive colours, green, yellow, orange and red indicate different levels of severity allowing maintenance locations to be brought to attention for site action; therefore, optimising maintenance allocation. The entire system is non-invasive and can be rolled out on site with minimal effort.

The RCM is a innovative cost-effective solution for all mine sites. Poorly maintained roads have a wide range of effects that include;

decreased production, increased fuel burn, increased mechanical wear, unsafe operating conditions, driver discomfort and higher rolling resistances. By implementing the RCM system, site can expect to obtain:

- A non-subjective method for maintenance allocation
- Increase cycle times
- Increase tyre life
- Reduce operating costs & fuel consumption
- Improve operational safety
- Improve wet weather recovery
- Lower cost per tonne hauled



Haul Road Engineering | Monitoring Solutions

About Proof Engineers

Proof Engineers is an Australian-based company that operates globally. Experts in haul road performance and optimisation, Proof Engineers excels in systems that help improve production for the mining industry. They specialise in improving operational efficiencies specifically through haul road design, construction management, maintenance programs and monitoring solutions.

Allmould Plastics expands facilities

NSW

OVER the past 22 years, Allmould Plastics has developed into one of Australia's leading plastics organisations in the mining sector.

Allmould Plastics has recently expanded its facilities in central NSW, more than doubling in size to help cater for mining development and growth.

"In expanding our current plant in Orange NSW, we have been able to service and maintain fast turnaround time on projects and services," Allmould Plastics director Charles Cantrill said.

With state-of-the-art facilities along with an experienced team and full custom-built workshop, no project falling under the plastic engineering sector was unachievable for Allmould Plastics.

Privately owned and operated, Allmould Plastics see its team as a family.

Allmould Plastics manager Scott Cantrill said its passionate team and culture was something the company had invested heavily in.

"By doing this we have acquired great capabilities and skills giving Allmould Plastics the expertise to take projects from concept to functionality," Mr Cantrill said.

NSW's Central West area has a heavy mining presence with the likes of Cadia, North Parkes, Cowal, Ulan and more companies basing their operations.

Allmould Plastics has grown and developed with the expansion of these



Allmould Plastics has more than doubled its size to help cater for mining development and growth. Image: Allmould Plastics.

sites and is now fully equipped and able to provide services Australia-wide, with some products reaching into Asia.

The company has a number of specialties within the mining sector including plastic injection, rotational

and extrusion moulding; polyurethane, fire resistant anti-static materials which are FRAS rated; plastic fabrication and welding; and urethane wear plates.

Within the mining sector, Allmould Plastics also specialises in customised

conveyor skirting; polymer lining, including reducing and eliminating product hold up; sheet sales including acrylics, PC and HDPE; product prototyping; and tooling and mould manufacturing facilities.

THE AUSTRALIAN
MINING REVIEW

FEATURES FOR NOVEMBER 2018

- BMA Coal
- BHP Olympic Dam
- Bounty Mining
- Capricorn Copper
- Ernest Henry Mine
- Iluka Resources
- Indigenous Contractors
- Metro Mining
- Mining in Dubbo
- Northern Minerals
- Ramelius Resources
- Resolute Mining
- Roy Hill
- Saracen Minerals
- Southern Ports Authority



CALL US TO BOOK YOUR PLACEMENT TODAY
BOOKING DEADLINE: October 5th 2018

BRAD FRANCIS
☎ (08) 6314 0303 📠 0405 345 312
✉ brad@miningoilgas.com.au

Minimise downtime with equipment inspections

NATIONAL

WITH ever growing pressures on mining operations, companies are extending the life of their equipment by leveraging Eriez' service capabilities.

Its technicians can inspect equipment on-site or the customer can deliver their equipment in-factory for a strip and inspect.

Eriez provides a detailed report outlining the best courses of action.

This may mean preventative maintenance or replacing minor components, updating electronics, or carrying out a complete rebuild to original OEM specifications.

All repairs and refurbishments are covered by an Eriez warranty.

Most importantly, Eriez understands the dangers associated with handling permanent magnets.

Its personnel are specially trained and follow specific job safety procedures to properly handle high-strength magnetic elements.

Eriez should always be contacted prior to any dis-assembling or when handling magnetic equipment to help ensure safety is paramount.

Downtime equals loss of production.

Eriez inspections and performance audits improve equipment availability by avoiding unscheduled downtime.

Its technicians have an unparalleled level of skill and knowledge understanding the application and



As good as new suspended electromagnetic repair.

limits of magnetic equipment.

Eriez is dedicated to its research and development programs that deliver technology improvements for the industry.

Advancements in technologies and innovations are often implemented as upgrades during rebuild processes.

An early innovation was the external oil expansion tank developed for its suspended electromagnets (SE).

This ensures that the magnet coils always stay completely submerged, thus preventing moisture infiltration and coil burn-outs.

Subsequently, Eriez SE magnets run cooler, are stronger, and last longer than

the competition.

The company has also retrofitted expansion tanks to competitor SE's to boost performance.

Eriez can improve the magnetic power of wet drum magnetic separators with enhanced circuit design and better-quality magnets.

The performance of vibratory feeders is improved with new energy saving components; metal detectors are improved with software updates; and smart phone technology can feedback real time data to enhance maintenance and operating processes.

Getting the maximum life depends on the equipment, its working conditions, duty and operating environment.

Process equipment represents a significant capital investment, and annual inspections are mandatory to maintain them in peak working order, to identify any looming issues and for the possibility of process improvements.

Regular equipment checks, process audits and in-plant certifications by Eriez will help maximise life.

Eriez has the complete in-house capability necessary to service, repair and refurbish damaged equipment quickly, accurately, and safely.

More information can be found by calling (03) 8401 7400, emailing sales.au@eriez.com or by visiting: www.eriez.com.au.

Maximise your Profit by Maintaining your Equipment

Eriez offers top quality technical service, repairs and on-site inspections

Most affordable rates in Australia!

- ◆ Onsite field service, inspection and repair
- ◆ Skilled handling of dangerous magnetic equipment
- ◆ Equipment re-manufacturing
- ◆ Original OEM parts
- ◆ Full "As New" warranties
- ◆ Auditing and reporting
- ◆ Full line of dedicated spares

75 Years Experience

Schedule Your FREE Inspection Today! (Conditions Apply)



613 8401 7400 sales.au@eriez.com Eriez.com.au

Magnet Rebuilds



Before



After

Wet Drum Separator Rebuilds



Before



After

Built for the expert, by the experts

INTERNATIONAL

THE FLIR T1K IR camera is built for advanced thermography users and consultants in the mining industry.

Whether a business is looking at high and low voltage electrical issues or mechanical applications on a mine site, the T1k will make inspections and surveys easier and quicker, while offering the maximum efficiency, versatility and safety required from a high performance FLIR Camera.

One issue FLIR's mining customers face today is trying to use an IR camera, which only has an LCD display outside in sunny conditions.

The T1k has a high-resolution viewfinder which shows the same information as on the LCD screen, making any inspection easy to see where issues and problems reside.

The new OSX Precision HDIR optical system provides unsurpassed image clarity, detail, and temperature accuracy, from the standard 28 degree lens to the wide angle, to the telephoto lenses.

The Precision HDIR optical system provides the ability to pinpoint the smallest anomalies from farther away than ever before, allowing users to stand back away from possible dangers of haul packs and other mining machinery.

More information can be found at www.flir.com.au or to arrange a demo of the FLIR T1K, FLIR can be contacted on 1300 729 987.



The revolutionary FLIR T1K camera is the result of five decades of infrared expertise.

FLIR T1K™

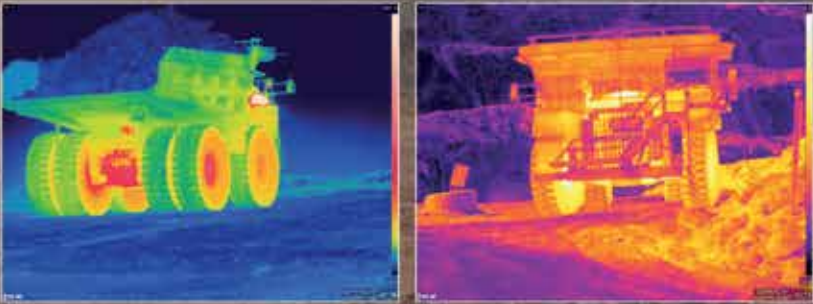
HD Thermal Imaging Camera THE ULTIMATE IN INFRARED PERFORMANCE

- ▲ Outstanding image clarity with a resolution of 1024 x 768 (786,432 measurement points)
- ▲ High resolution viewfinder to make surveys easier in bright sunlight
- ▲ Measure accurate temperatures from twice the distance using FLIR's OSX™ Precision HDIR optical lenses
- ▲ Exceptional thermal sensitivity of <0.02°C at 30 °C and a temperature range to 2000°C
- ▲ Up to 3.1 MP outstanding thermal image with FLIR UltraMax™ and MSX® technology
- ▲ Easy to use Interface, touch screen technology, MSX® Enhancement and 2, 5 & 10 year FLIR warranty

Please visit www.flir.com.au or call 1300 729 987 for more information



The World's Sixth Sense™



☎ (08) 9444 8005
 ✉ sales@sistec.com.au
 🌐 www.sistec.com.au

SIStec
 Specialised Industrial Systems

Suppliers and Manufacturers
 of Process Control Instrumentation

SIStec SS200 NUCLEONIC DIGITAL DENSITY GAUGE

Nucleonic Density Measurement of Slurries, Sewerage Sludge and Liquids

- Fully Digital operation
- Automatic gain stabilisation
- Low source activity
- NaI Scintillation detector
- Repeatability 0.0001 SG

SIStec PC-1 PUMP CYCLING CONTROLLER

Fluid flow adaptive controller for matching pump cycling to flow rate.

The SIStec Model PC-1 Pump Cycling Controller is a well-tested, rugged and reliable fluid adaptive controller used for matching pump cycling to fluid flow. By monitoring the supply current input from a motor, the PC-1 can differentiate between load and no-load conditions, such as when a pump runs dry. Using this information, the software adapting code automatically regulates a rest time equal to the subtraction of a cycle and run time.

Suitable for any pump application.

The PC-1 will reduce downtime and repair of damaged pumps from no-load conditions.



Original
commentary
and analysis



Cutting edge
technology,
products & services



Interviews,
Breaking news
and in-depth
company & project
profiles

WE'RE FOR THE MINING STORIES THAT MATTER.

Published monthly – in hardcopy and digital – The Australian Mining Review is a feature-based publication covering one of the nation's most significant economic powerhouses.

Every edition features:

- Original commentary and analysis
- Exclusive Interviews
- In-depth company and project profiles
- New technology, products and services

1 year (12 issues)

\$120 (+GST)

Australia only.

Subscribe today

Visit

<http://australianminingreview.com.au/subscribe/>

or contact us

accounts@miningoilgas.com.au

(08) 6314 0301

THE AUSTRALIAN
MINING REVIEW



Increasing traffic safety with glow-in-the-dark raised pavement markers.

Retroreflective pavement marker benefits

NATIONAL

DURA Product Industries' (DPI) high-quality glow-in-the-dark retroreflective pavement maker (RPM) can be used as a non-electric safety system in dark environments that lack artificial or natural lighting.

Exposing the RPM to any light source for about 30 minutes allows the material to absorb the light's energy and stay bright for hours.

The DPI AUMAX RRRPM are quality markers that have a unique design making them tougher, stick better and outlast other markers available in the

market.

Its optical lens provides outstanding optimal retro reflection of light for long periods of time; the glow in the dark material provides excellent awareness for vehicles and pedestrians; and its outer shell is made with high impact ABS material for long lasting strength

and wear resistance.

It is also filled with a special sand epoxy resin giving the product ultimate impact resistance and compressive strength.

The DPI AUMAX RRRPM base is made with no bottom joints meaning the product is highly durable, water proof and will not come apart.

Excellence in Traffic Safety

Day & Night Traffic Safety Products

- Solar / LED Traffic Light
- Thermoplastic Linemarking
- Removable Road Marking Tape
- Glow in the Dark & Survey Spray Paints
- Road Safety Reflectors
- Preformed Thermoplastic Road Marking Signs
- Raised Pavement Markers (RPM) & Temporary Tags

Dura Products Industries (DPI) - Manufacturer and supplier of road marking and road safety products for over 30 years.

PRODUCTS include:

- Thermoplastic Material
- Glass Cat Eye
- Glow in the Dark Markers
- Solar LED RPMs
- Solar LED Street Lights
- Solar Arrow Signs

59 Lincoln Street, Minto NSW 2566 Tel: +61 296 036 699 info@dopiaustralia.com.au www.dpirp.com

Textron's high performance systems

INTERNATIONAL

MINERS face numerous health and safety threats.

Over the past decade, the industry has sought to improve miners' health and safety by leveraging advances in unmanned aircraft systems (UAS).

UAS can remain on-station for hours; capture live video and imagery during various weather conditions; and quickly scan hundreds of square kilometres of ground – all while keeping operators out of harm's way.

However, to achieve these results in austere operational environments, system reliability is critical.

Textron Systems, which has a longstanding presence in Australia through its Melbourne facility, has built and operated UAS for several decades in military, civil, academic and industry applications.

"Maturity and reliability are critical for mining-related operations," Textron Systems Australia managing director Jack Kormas said.

"For example, our Aerosonde UAS has logged more than 275,000 flight hours and excels at large-area coverage — offering more than 15 hours of flight endurance and the ability to cover 200 km in five hours.

"Its payload capacity of approximately 10kg allows for a variety of cameras or sensors, providing high-definition, still or live aerial imagery and data by day or night."

UAS, like the Aerosonde, allow miners to inspect and survey more ground, quickly, all while keeping the miner at a safe distance.



More information can be found at www.textronsystems.com.

AEROSONDE® SMALL UNMANNED AIRCRAFT SYSTEM

Large Area Scanning with Beyond Visual Line of Sight
Covers 200 sq. kms in 5 hours, 15+ hours of flight endurance
Carries a variety of cameras and payload sensors
Increased Safety with Unmanned Technology



TEXTRON Systems

CONTACT US
TSAustraliaSales@textronsystems.com
www.TextronSystems.com
Phone: 0419 881 961

© 2018 AAI Corporation



Q. How does it feel to now be mining at Red Dog, and how do you respond to those that may “scoff” at something this size?

Last year we mined the Fortitude trial pit which was the precursor for us to go to the full scale of stage two mining at Fortitude, which we hope to kick off early next year.

We believe the Red Dog mine is extremely valuable for a company like us and very significant – it feels great.

When you produce, and you are not exploring but actually making money, for a small company that is fantastic – it means we do not need to raise capital from shareholders or investors, it means we do not have to increase our issued share capital so to us it's very important.

To those that claim that it is small and irrelevant my answer is quite simple – we will make in excess of \$5 million in 12 weeks – I can't think of any small company that is able to make a net profit of \$5 million in such a short time period.

A lot of our colleagues with large mines aren't making that kind of money.

I have had some people criticise saying “you are only a small mine why are you wasting your time” well if I wanted to raise \$5 million dollars, I would have to issue 40 million shares – we got it at 170 million shares this year, for us to raise \$5 million dollars I would have to dilute the company on a 1 to 5 basis or issue 20 per cent of our company's stock out.

Now to me that is significant, that is a lot of shares on a ratio basis.

If I'm saving that dilution it is a wonderful event.

If I could have three or four of these mines in a row, that would be wonderful.

The other very important thing is that this ore deposit has been only explored very shallow, we do not know what is underneath, we do not know if there are extensions – this mine will provide us with money to explore underneath.

Q. Take us through your agreement with AngloGold Ashanti, and how this has benefited you so far?

I am under confidentiality with AngloGold Ashanti, but what I can say is a similar formula occurs this time as we had with the Fortitude mine trial pit; in that we deliver ore to AngloGold Ashanti and all risks of that ore transfers to AngloGold Ashanti at the time that we deliver that ore.

We get the full benefit of the daily gold fluctuations in price, so we have not locked in the gold price – and we get the disadvantages of a falling gold price.

But the gold price is going our way in Australia at the moment.

We have already pre agreed our grade – we have already done all the grade control drilling for the entire ore delivery volume.

That is being done on a 10 metre by 10 metre basis, so we have got very high confidence.

It is a very fortunate circumstance for Matsa to have such a great relationship with AngloGold.

We have an enormous amount of trust in them and they are displaying a lot of trust in us – that is significantly shown in the MOU that Matsa resources and AngloGold have.

We share technology, share discovery, share know-how, share access roads, share infrastructure, share emergency response and share research and development technology.

The relationship probably advantages us more than it advantages them.

They have a massive plant, their Sunrise Dam plant is huge – nearing 4 million tonnes per annum – so if they can source feed from a reliable and trusted outsider like Matsa that preserves their stockpiles and their ore in ground.

It is a win-win scenario for both companies and that is a good way to be.

Q. Do you think more juniors should partner up with bigger players in similar arrangements?

Each circumstance is different, each project has its own unique requirements. We are very fortunate that the whole team at AngloGold are good people.

Obviously Matsa have done things right

by them; we have proved to them that we can be trusted; we have proved to them that we can deliver on what we promise; we have proven to them that our ore and gold resource is quality; and we have proven to them that we won't let them down.

I encourage any junior to get married with a larger corporation where that relationship can be founded on mutual trust and mutual benefit, and the parties produce a win-win scenario for all involved and it is not one sided.

Q. You've had some drilling success across other areas at Lake Carey recently. Can you describe the significance of recent results?

We desire to have a large gold producing company as quickly as possible.

Matsa currently has just under half a million ounces of good quality gold in resource. We have got the Red October gold mine and we are working very hard to get that into production, which we hope we will be able to do in the near term.

We have got the Fortitude gold mine that has approximately 340,000 ounces of gold in resource that we hope to get into production by early next year, and of course we have Red Dog.

To make Matsa a convincing long term gold play we need to find more gold, and we think that we are on the cusp of a significant discovery just north of the Fortitude gold mine.

We are currently drilling 4km north of Fortitude at our prospect called Fortitude North, and are hoping to get results next month.

I note that a lot of our ground is part of Lake Carey – any ground in the Lake Carey region that is on the lake has been very poorly explored in the past. Drilling on a lake historically has been very difficult and very expensive.

In fact, AngloGold Ashanti vice president WA Mike Ericson said at Diggers and Dealers that in his opinion Lake Carey is one of the hottest exploration areas in Australia and we totally agree with that concept because it has been poorly explored.

Q. What is your plan after the three month mining campaign at Red Dog?

We expect to make more than \$5 million profit in this three month period and we will immediately turn our hand at getting Red October into production.

We think Red October will be a significant high value gold mine for the company..

We will then also turn our hands simultaneously to get Fortitude into production, and of course we will continue exploration and hopefully by then be onto something that is already significantly discovered.

Q. How do you see the resources sector evolving in the next few years, and how will that affect the way Matsa Resources does business?

I think that the resources sector is a very good place to be.

I know right now and the last couple of months has been a difficult area of the market. It has been quite negative.

But it is my opinion this fall in metal prices is overdone, not sustainable and I believe that the metal prices will recover.

The impact on Matsa will be significant. Our resources, especially Fortitude Gold, are directly correlated to the gold price.

If that price goes up Fortitude really comes in to play.

Red October is profitable now if we can get enough reserve behind us, which we think we can.

But Fortitude, which is very sensitive to the gold price, if that can go to production Matsa can be quite a good gold producer. It could be approaching 50,000 to 60,000 ounces per annum.

For a company that only has a \$25 million dollar market cap that we speak of today with quite a small number of shares with little debt of \$3 million – an increase in gold price would be a significant positive effect on our production capacity and will have a significant effect on our share price.

A LONG WAY TOGETHER



BKT
GROWING TOGETHER

TFT
TYRES
1300 916 556