

THE AUSTRALIAN MINING REVIEW

PP100007123

Incorporating THE AUSTRALIAN ENERGY REVIEW

APRIL 2018

australianminingreview.com.au

A product of
Publications & Exhibitions Australia Pty Ltd

COMMODITY
FOCUS:
LITHIUM

NEWS **p18**



THE
MOTHER OF
INNOVATION

TOMAGO
ALUMINIUM **p42**



CERVANTES:
MARCUS FLIS

THE
INTERVIEW **p62**



MAJOR COMMODITIES SNAPSHOT **p4**

GAME PLAN

Mineral sands miner Iluka may have flown under the radar during the resources rally. But with great assets, a shrinking debt pile and first rate management – not to mention some of the best market conditions in 5 years – Iluka is ready for a year of delivery at its Sierra Rutile, Jacinth-Ambrosia and Cataby projects.

FEATURE **p38**

Image: Iluka Resources.

EMS
GROUP

GET RUNNING, STAY RUNNING
WITH THE BEST VALUE
SKILLED LABOUR AND
EQUIPMENT SOLUTIONS

Contact us for an obligation free proposal



emsgroup.com.au/amr

What stories matter to you?



reuben@miningoilgas.com.au

NEWS	1
Commodities Snapshot	4
Explorers on the Move	10
The Contractors	12
Technology & Innovation	14
International	16
Commodity Focus: Lithium	18

SPECIAL FEATURES	
Evolution Mining	19
Newmont Tanami	22
Resolute Mining	26
Galaxy Resources	28
Bald Hill Lithium Mine	30
Bauxite Mining in Cape York	34
Iluka Resources	38
Hillgrove Resources	40
Tomago Aluminium	42

INDUSTRY SPOTLIGHT	
Companies Gearing Up	48
Bus & Coach Services	52
Coagulation & Flocculation	55
Condition Monitoring	58
Hydraulics & Pneumatics	60
Mobile Plant Maintenance	61

UNDER THE SPOTLIGHT:

CERVANTES CORPORATION

the interview p62

RIO

COMPLETES COAL EXIT

news p8

ACTING

BOLDLY

EVOLUTION MINING

feature p19

BAUXITE

BOOM

CAPE YORK

feature p34

PUBLISHED BY
ABN 28 112 572 433



A product of
**Publications &
Exhibitions Australia Pty Ltd**

GENERAL MANAGER

Brad Francis
brad@miningoilgas.com.au

MANAGING EDITOR

Reuben Adams
reuben@miningoilgas.com.au

JOURNALISTS

Cameron Drummond
cam@miningoilgas.com.au

Elizabeth Fabri
elizabeth@miningoilgas.com.au

GRAPHIC DESIGNER

Charlotte Lufino
charlotte@miningoilgas.com.au

Moe Aung
web@miningoilgas.com.au

SALES EXECUTIVES

Beej Francis, Penny West, Daniel Mott

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.

GOLDRUSH TOURS
GRT Minesite Transfers

08 9092 6000
www.goldrushtours.com.au

info@goldrushtours.com.au | 19 Epis Street, Kalgoorlie



Transporting the Mining Industry's **Most Valuable Asset** for **Over 40 Years**

EURO AUCTIONS

BRISBANE Australia

161 Sandmere Road, Pinkenba, QLD, 4008

Buyers commission 2.5%

OPEN TO THE PUBLIC - 100% UNRESERVED AUCTION



Wednesday 18th April 2018 @ 8.30am



Unused Hitachi
ZX470LC-5G



2011 CAT 329DL



2002 Doosan SL250LC-V



2016 JCB 110W - choice



Unused Case CX80C



Unused Yanmar VI055-5B



14-15 Doosan DA40
- choice



11-12 CAT D8T - choice



2013 CAT D6T



2014 CAT D6K-2 XL - choice



2014 CAT 140M - choice



2012 CAT 12M - choice



2013 CAT 972K



Unused CAT 950GC
- choice



Unused CAT 432F2 - choice



2014 CAT CP54B - choice



2015 Terex Finlay 694+
Supertrak Triple Deck 4 Way
Split Track Screener



2018 Barford S104 Inclined
3 Way Split Screener

Brisbane Office (QLD)
T. 0736 074800
E. info@euroauctions.com

Paul Haynes (NSW)
T. 0429 534493
E. phaynes@euroauctions.com

Craig Hart (QLD)
T. 0417 927337
E. chart@euroauctions.com

Jacob Webber (QLD)
T. 0413 172700
E. jwebber@euroauctions.com

Visit our website for full inventory

www.euroauctions.com



TSURUMI

Extreme conditions reveal TRUE VALUE

Deep well dewatering through to slurry pumps

- Cast iron, 316 stainless & Titanium
- Heads to 200m
- 1000v options
- Japan's largest manufacturer
- 3 year warranty

FREE selection guide
02 8865 3500

Aussie Pumps



AUSTRALIAN PUMP INDUSTRIES PTY LTD
info@aussiepumps.com.au
www.aussiepumps.com.au

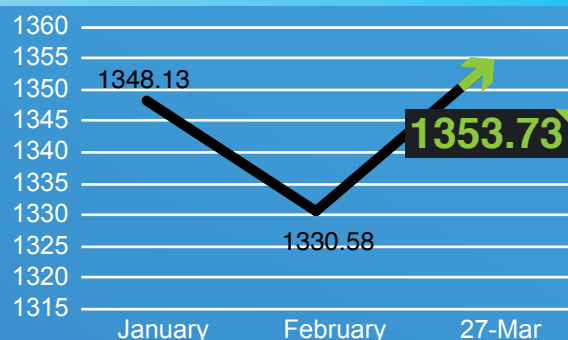
MAJOR COMMODITIES

SNAPSHOT

GOLD

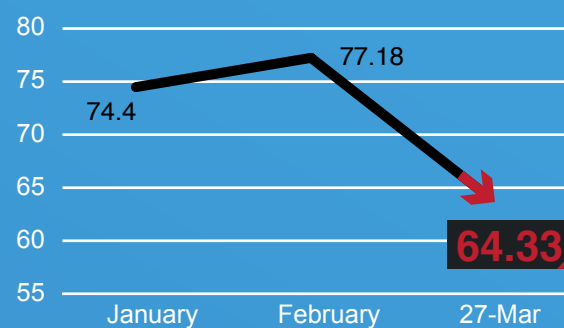
\$US/oz

Gold fell slightly in the first three weeks of March, but has rebounded to stay above the \$US1350 level by April due to market uncertainty.



IRON ORE

\$US/t
62% Fe CFR China

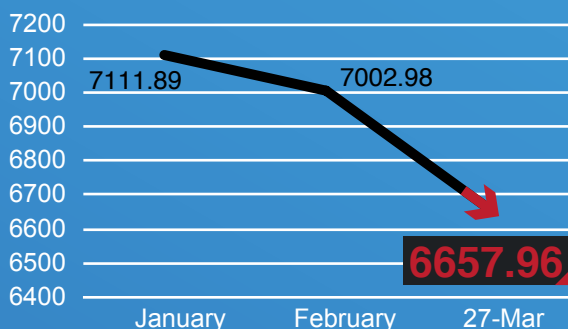


Iron ore had continued its bull run ahead of 2018 forecasts, hovering around \$US75/t, however Chinese steel stockpiling has caused uncertainty on the demand side causing prices to drop below \$US65/t.

COPPER

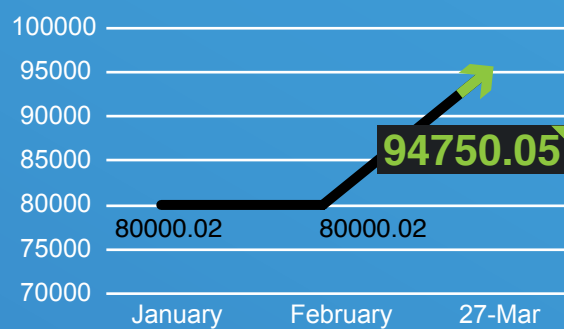
\$US/t
LME Price

Copper has continued its decline a three month low amid volatile demand from importers.



COBALT

\$US/t
LME Price

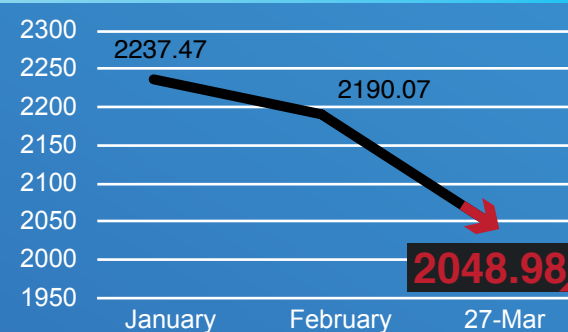


Cobalt has surged once again, rising almost \$US20,000/t since the start of the year on the back of high demand for its use in the manufacture of lithium-ion batteries.

ALUMINIUM

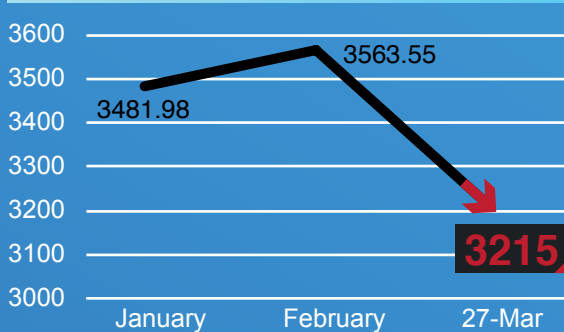
\$US/t
LME Price

While Australia has avoided a 10 per cent tariff on aluminium imports into the US, spot prices for the commodity remain at its lowest levels since mid-December.



ZINC

\$US/t
LME Price

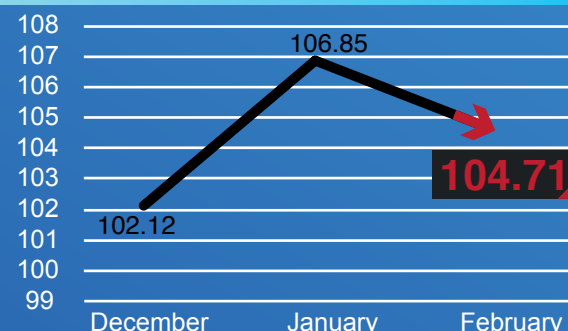


While recently flat, zinc has also dropped during March in line with other steel making raw materials.

COAL

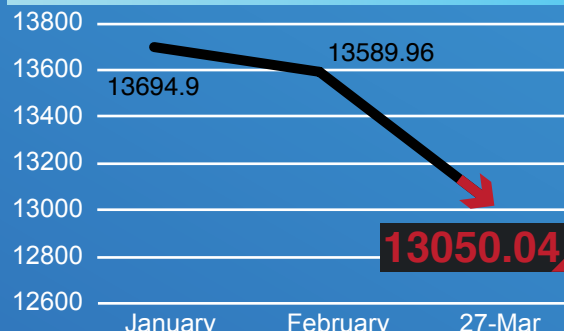
\$US/t
Australian Thermal

High demand for quality thermal coal has kept prices above \$100/t despite China's winter shutdown of industrial facilities.



NICKEL

\$US/t
LME Price



Nickel prices have been affected by market instability across the commodity sector.

COMMODITY FOCUS > LITHIUM PG 18

VIRTUAL REALITY TRAINING FOR:

- PRE-EMPLOYMENT SCREENING
- HAZARD AWARENESS TRAINING
- WORKPLACE PROCEDURES
- SUPERVISOR TRAINING
- EVACUATION TRAINING
- MINE INDUCTIONS

Can your operators immediately recall the correct response to an emergency event?

From pre-employment screening to supervisor training, WorksiteVR™ Quest is a cost-effective tool to reduce hiring costs, improve safety awareness, increase identification of safety and productivity risks and build confidence when facing emergency events.

WorksiteVR Quest is the winner of the CME Innovation Awards 2016 and already showing quantifiable results for **Mine inductions** and **Safety training**.

REQUEST A DEMO TODAY

Mention: Quest Demo

Call: +61 8 9347 9000

Email: Enquiries@ImmersiveTechnologies.com

Visit: www.ImmersiveTechnologies.com/quest

IMMERSIVE
TECHNOLOGIES

EXPECT RESULTS



LEADERS IN LITHIUM

PRIMERO ARE AN INDUSTRY LEADER IN THE ASSESSMENT AND DEVELOPMENT OF HARD ROCK LITHIUM PROCESS INFRASTRUCTURE PROJECTS GLOBALLY. WITH A DEEP UNDERSTANDING OF LITHIUM MINERALOGY AND SUBSEQUENT CONCENTRATION AND CONVERSION TECHNIQUES PRIMERO IS YOUR IDEAL PROJECT DEVELOPMENT PARTNER.

THE BALD HILL STORY

Primero were engaged by the Tawana Resources (Tawana) and Alliance Mineral Assets Limited (AMAL) joint venture to complete the design, procurement, construction and operation of the Dense Media Separation (DMS) circuit at their Bald Hill Lithium and Tantalum mine in the Eastern Goldfield region of Western Australia.

Priorities for the JV were to gain first mover advantage over their peers and capitalise on heightened demand for spodumene concentrate by fast-tracking the project's development. Primero were able to deliver on promise in meeting the challenging schedule, reaching practical completion and first concentrate production in March 2018.

"The project has already been billed as one of the swiftest to production in the history of mine development in Australia"

PROJECT HIGHLIGHTS

- + Maiden lithium resource to concentrate production in 9 months.
- + Completed on time and to budget.
- + Incident free.

Primero is delighted to continue supporting the JV as we continue to operate the process infrastructure at Bald Hill and wish to congratulate the Tawana/AMAL team on the production of first concentrate.

PRIMERO

A MULTI-DISCIPLINARY ENGINEERING GROUP WHO DESIGN, CONSTRUCT AND OPERATE MINERAL PROCESSING FACILITIES AND THEIR ASSOCIATED INFRASTRUCTURE.

DRIVING
PROJECTS
FORWARD
PRIMERO.COM.AU

IN BRIEF

Koolyanobbing
mine closure
looms

WA

US-based iron ore miner Cleveland-Cliffs will wave off its last shipment from its Koolyanobbing iron ore project in June.

The 11 million tonne per annum project, near Southern Cross in WA, has exported iron ore out of Esperance since 1994, and delivered hundreds of jobs for the local community.

In January, Cleveland-Cliffs announced it would close its Australian operations in 2018 amid market appetite for higher grade ore.

The Southern Ports Authority and mining staff have since been notified of the closure date.

“As a result, the confirmation of this action will result in a big change not just to the port, but to the broader Goldfields-Esperance community,” Southern Ports chief executive Nicolas Fertin told staff.

Centrex sells iron
ore mine

SOUTH AUSTRALIA

CENTREX Metals has sold its South Australian iron ore assets, Wilgerup and Kimba Gap, to GFG Alliance subsidiary SIMEC Mining for a \$10 million royalty.

Under the deal, SIMEC will pay a royalty upon commencement of mining, which would be capped at \$5 million for each project.

If SIMEC does not commit to mining at the project within the next decade, Centrex has the option to reclaim ownership.

The sale marks Centrex’s move away from iron ore to focus on its fertiliser mining developments, including the Ardmore phosphate rock project in QLD.

OZ Minerals
bids \$444m for
Avanco

COPPER

Mid-tier copper miner Oz Minerals has made a \$444 million offer to snap up junior copper explorer Avanco Resources.

The Avanco board has advised shareholders to accept the offer, with two major shareholders representing 30 per cent indicating their support for the takeover.

The prize asset for OZ will be Avanco’s asset portfolio in the world-class Carajas region in Brazil.

“OZ Minerals’ offer is at a significant premium to recent trading levels and provides an attractive opportunity for Avanco shareholders to both crystallise value today whilst also maintaining base metals exposure through their holding in OZ Minerals, one of Australia’s leading base metals producers,” Avanco managing director Tony Polglase said.

Industry supports revived TPP

REUBEN ADAMS
INTERNATIONAL

THE Minerals Council of Australia and nine other national industry groups have expressed strong support for the resurrected Trans-Pacific Partnership (TPP), which was formally signed in Chile by 11 nations after the US backed out last year.

Ministers and senior officials representing Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam, signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership on 8 March.

The TPP-11 will enter into force 60 days after at least 50 per cent of the original signatories to the Agreement have notified each other of the completion of their domestic legal procedures.

US President Trump’s decision to withdraw the world’s largest economy from the deal was one of his first actions as President, but the newly signed TPP-11 agreement could still eliminate more than 98 per cent of tariffs in a trade zone with a GDP of \$13.7 trillion that spans the Americas and Asia.

Economic modelling released by the Minerals Council and nine the industry bodies claimed the current TPP would boost the value of Australia’s exports by \$30 billion – or four per cent – and increase Australia’s GDP by \$18 billion, or 0.5 per cent.

“Australia is a trading nation – 2.7 million Australian jobs rely on trade and trade accounts for 40 per cent of our economy,” the report stated.

ELIZABETH FABRI
NATIONAL

THE amalgamation of three of Australia’s largest unions to form a new 144,000 member-‘super union’ has received a strong response from industry.

In early March, the Fair Work Commission (FWC) approved the formation of the new union, CFMMEU, comprising the Construction, Forestry, Mining and Energy Union (CFMEU), Textile Clothing and Footwear Union of Australia (TCFUA), and Maritime Union of Australia (MUA).

Mr Crumlin said the approval of the merger was a “historic day” for Australian workers.

“Wherever there is a need to defend the interests of Australian workers, we will be there with them in their workplaces and communities,” Mr Crumlin said.

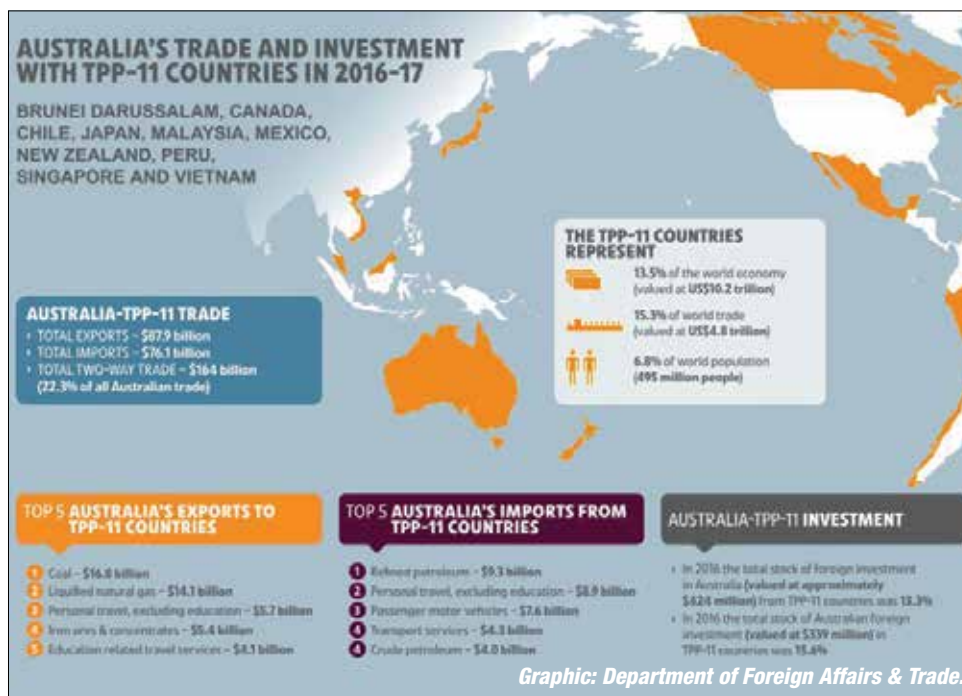
However the move was met with opposition from mining and construction employer groups the Australian Mines and Minerals Association (AMMA) and Master Builders Australia (MBA).

AMMA and MBA lodged an appeal against the FWC decision, arguing the merger “will put the economy and jobs in jeopardy”.

“The MUA and CFMEU appear to share a common belief that they are above the law and are renowned for using tactics such as bullying, intimidation, and industrial thuggery on anyone who disagrees with them,” MBA chief executive Denita Wawn said.

“Merging these two unions into one new, militant ‘Super-Union’ will see these illegal tactics become more prevalent, giving them even greater power to coerce business, put jobs at risk and bring the economy to a standstill.”

Federal Workplace and Deregulation



“That means it is in Australia’s interests to resist protectionist pressures.

“Modelling shows that if countries around the world imposed extra tariffs of just 10 per cent, Australia’s economy would contract by 1.4 per cent, risking higher unemployment and lower incomes.

“This means supporting the TPP would be a strong statement in favour of international trade and open markets, which are critical for Australian prosperity and for our long-term strategic interests as a nation.”

According to the Department of Foreign Affairs and Trade, Australian exports of resources and energy products to TPP-11 countries are valued at around \$42 billion.

“The TPP will create new opportunities for Australian mining and mining services exports in the Asia-Pacific – opportunities which will benefit all Australians by supporting jobs, living standards and economic growth,” the Department stated.

The TPP-11 would eliminate tariffs on key Australian minerals, petroleum and LNG exports and lock them in at zero, and improve regulatory environments for Australian miners and oil and gas companies seeking to find and develop reserves in the region.

Australian Mining Equipment, Technologies and Services (METS) businesses also stood to benefit from better market access conditions.

‘Super union’ merger sparks debate



Union leaders celebrating the win.

minister Craig Laundy also criticized the decision, stating the union could have an impact on supply chains economy wide, far beyond their respective sectors.

“In particular if you look at the CFMEU side of this merger, we’ve currently got 77 individuals before the courts, and over the past two to three years around \$13 million in fines issued,” Mr Laundy told ABC.

“The problem now is that this union would have yearly revenue of around \$150 million and the risk is they’ll treat those fines as a cost of doing business without thinking more broadly the damage they could be doing.”

CFMEU national secretary Michael O’Connor said the group will “hit the ground running immediately”.

“Big Business has too much power, we have record levels of inequality in our community, and working families are finding it hard to make ends meet,” Mr O’Connor said.

“It’s time for big business to stop riding on the coattails of everyday working Australians, time the banks stopped ripping people off, and time for every business in this country to pay tax.

“Nearly 700 big corporations pay no tax, which is a national scandal.”

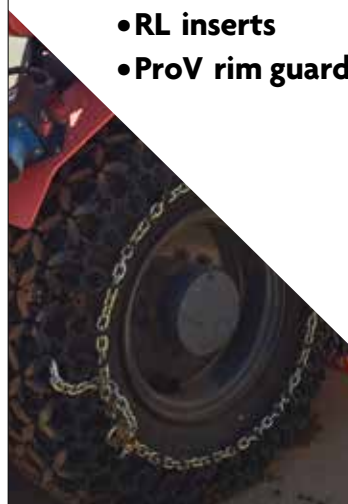
Image: CFMEU.



Specialising in Earthmover / OTR

- Tyre protection chain sales
- Tyre sales - Michelin & Goodyear distributor
- Rim sales — ProV rims up to 63"
- Complete wheel assemblies — CTR, CT, TR
- Rim certification & repair
- OTR tyre repair
- OTR tyre handler / site service trucks
- RL inserts
- ProV rim guard

T: 08 9358 3286 W: www.tyrechainsaustralia.com E: tca@provideaustralia.com



PROVIDE Australia

OUR MODULAR WASH BAY SYSTEMS HAVE ARRIVED!

- ✓ Fully self-contained & environmentally friendly — process any volume of wash water with full recycling, filtration and conditioning systems and easy waste solids disposal
- ✓ Modular system — allows for flexibility in size and configuration
- ✓ Industrial strength — hot galvanised and stainless steel components ensure corrosion free operation in the toughest working conditions
- ✓ Requires no site works or external plumbing
- ✓ Special features — crane slot, 3m drive on access ramps, 3.5t deck trolley
- ✓ Suitable for Mining, Agriculture, Industrial & Commercial Properties our bays are the answer for any wash requirements.



Contact our team to find out more: E: Sales@provideaustralia.com, Rod: +61 418 909 596

Business conditions “robust”

REUBEN ADAMS
NATIONAL

NAB has recorded a 3 point jump in its Monthly Business Survey to +21 index points for February, the highest level since the survey began in March 1997.

On a trend basis, the survey recorded strongest conditions in construction, mining, finance, and property and business services. Mining and construction were also the most confident industries.

NAB Group Chief Economist Alan Oster said the results indicated that business activity in Australia was robust across the board.

“The survey results for February reinforce our views on the outlook for the Australian economy,” he said.

“After last week’s release of below expectation GDP growth data, the strength in business conditions and leading indicators makes us more confident that Australia will see stronger economic growth in coming quarters on the back of LNG exports, and business and Government investment.”

This would sustain jobs growth, reduce unemployment, and put gradual upwards pressure on private sector wages, Mr Oster said.

“We expect by late 2018 the RBA will feel relaxed enough about the domestic fundamentals to cautiously start withdrawing the stimulatory policy stance it is currently running,” he said.

“However, it will depend heavily on the data flow and the risk is that the RBA will delay rate rises until early 2019.”

Rio completes coal exit



Rio’s 80 per cent stake in Kestrel was bought by a consortium headed by private equity manager EMR Capital.

ELIZABETH FABRI
QLD

RIO Tinto has completed its exit from the coal industry after agreeing to sell its remaining QLD coal assets for \$US4.15 billion.

The mining giant has been on a selling spree in recent years, letting go of assets such as its \$US2.7 billion Hunter Valley Operations (HVO) to focus on growth in iron ore and copper.

In March, Glencore was named the winning bidder for Rio’s 82 per cent interest in Hail Creek open cut mine and its 71.2 per cent interest in the undeveloped Valeria project, paying \$US1.7 billion for the assets.

Days later, Rio entered a binding agreement

to sell its 75 per cent interest in Winchester South undeveloped coal project to Whitehaven for \$US200 million.

The next project on the chopping block was Rio’s 80 per cent interest in Kestrel, which was sold to a consortium comprising private equity manager EMR Capital and Indonesian listed coal company PT Adaro Energy Tbk for \$US2.25 billion.

Rio Tinto chief executive J-S Jacques said the sale of the coal assets was in line with its strategy of strengthening its portfolio, and allocating capital to the highest value opportunities.

“The sale of Kestrel, together with the announced divestments of Hail Creek and our undeveloped coal projects, delivers exceptional value to our shareholders and will leave our

portfolio stronger,” Mr Jacques said.

In a statement, Glencore – which purchased a 49 per cent interest in HVO following Yancoal’s acquisition of Rio’s Coal & Allied business in June 2017— said its Australian coal division produced more than 87 million tonnes of saleable coal in 2017 from 17 operational mines in QLD and NSW.

Hail Creek will add a further 9.4 million tonnes of coal to Glencore’s annual production.

Australian resources private equity firm and new Kestrel owner EMR Capital has also been making moves in the industry with nine operations worldwide, including the Golden Grove base and precious metals mine in WA.

The three sales were expected to finalise in the second half of 2018, subject to regulatory approvals.

Cadia shutdown after dam collapse

ELIZABETH FABRI
NSW

NEWCREST Mining will fall short of its production guidance in FY18 after a tailings dam wall collapse at Cadia gold mine last month forced operations to a standstill.

While it was too early to provide an indication of damages, the miner said the dam collapse would “adversely impact guidance for FY18”.

The tailings wall breach on 9 March involved a limited breakthrough of material at the northern dam embankment, which was contained in the adjacent tailings dam to the south.

Newcrest said cracks were identified earlier that day during a regular inspection before the dam failed later that evening.

“When such cracks were noticed the site team quickly engaged an independent geotechnical consultant to assist Newcrest’s geotechnical engineers at Cadia with an inspection and preliminary assessment of the embankment,” it stated.

At the time, Newcrest confirmed there were no injuries or further threats to safety, but as a precaution it would suspend all mining and processing operations at the mine until further notice.

On 27 March, after a two and a half week break, Newcrest recommenced mining operations

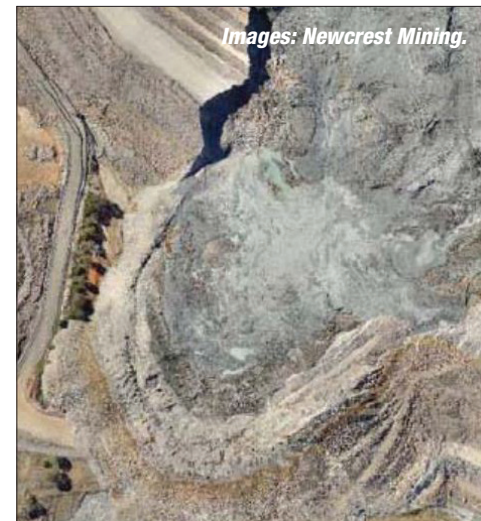


The Northern and Southern (forefront) tailings dam at Cadia.

at Cadia East with mined ore to be stockpiled at surface until processing resumes.

Newcrest said it was undertaking work on multiple recovery scenarios, including alternative tailings locations such as the old Cadia Hill open pit.

“Newcrest continues to work with the NSW regulators on permitting the Cadia Hill open pit tailings option and has commenced procurement of some of the necessary equipment to allow this possibility to be utilised if approved,” Newcrest stated.



An aerial view of the failure zone.

“A prohibition notice issued on depositing tailings in the northern tailings facility remains in place.”

Newcrest managing director and chief executive Sandeep Biswas said the miner did a group wide review of all of its tailings facilities following BHP’s Samarco tailings dam disaster in Brazil in November 2015, with Cadia’s dams reviewed independently in 2016 and 2017.

“This was a total surprise to us given all of the reviews of the dam and certification that we’ve got so we will have to do a little bit of soul

searching there clearly,” Mr Biswas said.

This wasn’t the first time Cadia production has taken a hit.

In April 2017, a magnitude 4.3 earthquake near Cadia forced the mine to shut for three months, which resulted in a 48 per cent drop in profits for Newcrest.

Newcrest previously declared it would produce between 680,000 and 780,000 ounces of gold and about 70,000t of copper out of Cadia in FY18; in the first half, Cadia produced 300,737oz of gold and 30,459t of copper.



Control System and Electrical Engineering Specialist

TURNKEY PROJECTS

OPERATIONS

MAINTENANCE

OPTIMISATION

TRAINING

Technical design, specialist engineering precision, flawless control systems and operator interface. Our vast experience in PLC's, SCADA, DCS, and control system design & integration gives our customers a solid foundation on which to base their projects. Our experts bring reliability, efficiency and innovation whilst eliminating downtime and increasing output to your operations.

➤ PLC / SCADA / HMI / SAFETY PLC
SOFTWARE DEVELOPMENT

➤ RADIO / TELEMETRY

➤ ELECTRICAL ENGINEERING DESIGN
(FRONT END, CONCEPT, DETAILED)

➤ SOLAR FEASIBILITY & DESIGN

➤ MANUFACTURE / SUPPLY OF CONTROL
PANELS AND MCC's.

➤ NETWORKING AND COMMUNICATION

➤ COMMISSIONING & TESTING

➤ PERFORMANCE / OPTIMISATION

➤ INSTRUMENTATION

➤ FUNCTIONAL SAFETY

➤ TRAINING AND AUDITING

➤ PROJECT MANAGEMENT

ISO:9001:2015 Quality Management Certified
Integrator partners include: Schneider, Siemens, Rockwell and GE amongst others.



08 9477 3919 | info@megatronicpower.com | megatronicpower.com

Nordberg® HP Series™ cone crushers provide higher production with less downtime

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

Nordberg® HP Series™ cone crushers feature a unique combination of crusher speed, throw, crushing forces and cavity design. This field-proven combination provides higher capacity and superior end-product quality in all secondary, tertiary and quaternary applications. Compared with equivalent-sized crushers, Nordberg HP has a larger output capacity, higher density in the crushing chamber and a better reduction ratio. This enables you to produce prime quality end products with lower energy consumption.

Find out more about Metso's crushers at www.metso.com

#TheMetsoWay



Nordberg HP4



IN BRIEF

Rothsay project gets funding

WA

EGANSTREET Resources has secured \$11.9 million in funding to progress exploration and development at its Rothsay gold project in WA.

The explorer obtained funds through the exercise and underwriting of the company's listed options, both from existing shareholders and an oversubscribed underwriting agreement.

"This is a fantastic result for EganStreet which ensures that we are now fully-funded through to a decision to mine at Rothsay, putting us firmly on track to join the ranks of Australian gold producers next year," EganStreet managing director Marc Ducler said.

EganStreet plans to deliver an updated Mineral Resource estimate and Definitive Feasibility Study in the June quarter.

Interim reveals 'world-class' vanadium resource

QLD

EXPLORATION junior Interim Resources has revealed a large, high grade vanadium mineral resource at its Richmond project in North QLD.

Drilling activities have revealed an inferred mineral resource of 2.579 billion tonnes grading at 0.32 per cent vanadium, making it one of the largest vanadium deposits in the world.

Additional metallurgical test work is being conducted and initial results are expected in the June quarter this year.

"The Richmond project hosts a globally significant vanadium resource amenable to low cost, shallow open cut mining in close proximity to existing road, rail and ports," Interim managing director Jon Price said.

Galena to begin drilling at Abra

WA

BASE metal explorer Galena Mining will start an aggressive drilling campaign at its wider Abra tenement package where high-grade historic intersections of copper, silver, lead and zinc have been identified.

Exploration will be conducted at the Woodlands, Quartzite Well and Manganese Range prospects as part of a pre-feasibility study for Abra, scheduled for completion in Q4 2018.

"Whilst Abra as a standalone and globally significant lead-silver project is the core focus of the company we are also particularly interested in giving some attention to the Woodlands, Quartzite Well and Manganese Range prospects," Galena chief executive Ed Turner said.

\$100m JMEI boosts exploration

REUBEN ADAMS
NATIONAL

LEGISLATION introducing the four year, \$100 million Junior Minerals Exploration Incentive (JMEI) was successfully passed by the Senate in March.

Replacing the former Exploration Development Incentive (EDI), the JMEI meant greenfields exploration programs could distribute their tax losses as a credit to Australian resident shareholders.

WA Finance minister Mathias Cormann said the tax incentive was based on industry feedback and would encourage junior explorers to take risks.

"We want to back these businesses," Minister Cormann said.

"We are working to get the economic fundamentals right to build a strong prosperous Australia, improve the business climate and unleash our economic potential."

The ability of an exploration company to give up their tax losses to distribute credits to investors as a tax offset will make investing

in a junior explorer much more attractive, Minister Cormann said.

"It aims to improve on the timeliness of the offset and to target new investors that participate in new capital raisings," he said.

"This will help maximise the incentive for additional investment in minerals exploration."

Association of Mining and Exploration Companies (AMEC) chief executive Warren Pearce said the passage of the Bill demonstrated clear bipartisan support in Parliament for this legislation.

"AMEC has fought long and hard for the realisation of this legislation," Mr Pearce said.

"The JMEI is desperately needed to support Australian mineral exploration. The decline in greenfields exploration over the last decade is a significant concern, and one that threatens to undermine the future growth of the mining industry in Australia.

"Greenfields exploration is where Australia will make the next big discovery that will power the Australian economy for years to come."



EDI & JMEI: WHAT'S THE DIFFERENCE?

Like the EDI, the JMEI provides a tax incentive to invest in small exploration companies undertaking greenfields minerals exploration in Australia.

Australian resident investors of these companies receive a tax incentive where the companies choose to give up a portion of their tax losses relating to their exploration expenditure in an income year.

Unlike the EDI, under the JMEI:

- Eligibility is limited to investors that purchase newly issued shares
- The incentive is allocated between eligible exploration companies on a first come, first served basis until the annual cap is reached
- A cap on the amount of credits allocated to an entity of 5 per cent of the total amount available for each year.
- The scheme applies from 1 July 2017 to 30 June 2021, with total credits limited to \$100m

Tawana plans non-core spinoff

CAMERON DRUMMOND
WA

LITHIUM producer Tawana Resources will spin out three non-core assets to focus efforts on its flagship Bald Hill lithium project.

The restructure involves the transfer of the Cowan and Yallari lithium projects in the Eastern Goldfields, as well as the Mofe Creek iron ore project in Liberia, into a wholly-owned public company 'SpinCo', before undertaking a capital reduction and distribution of 85 per cent of all SpinCo shares to Tawana's shareholders.

The new company would not initially seek an ASX listing, but this would be considered by the SpinCo board in due course, Tawana stated.

"Following the recent commissioning and first spodumene concentrate production at Bald Hill, Tawana's primary focus is to ensure effective ramp-up of production and to ensure exploration activities are focused 'near mine' to drive growth in mineable reserves and extend associated mine life at Bald Hill, of which the company has explored less than 5 per cent of the known prospective area," Tawana managing director Mark Calderwood said.

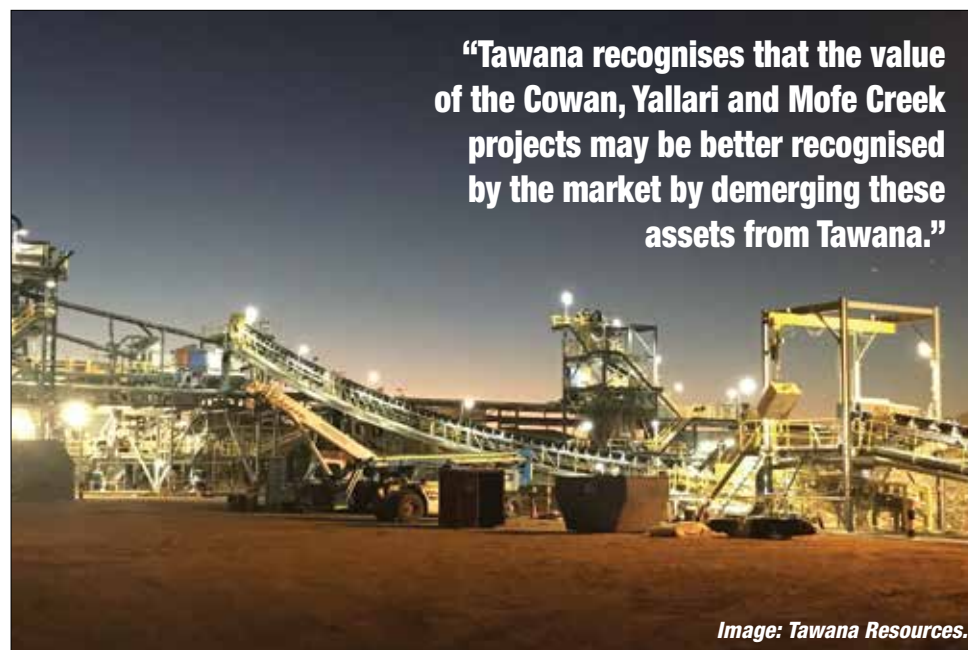


Image: Tawana Resources.

Tawana said the spin out would unlock better asset value for SpinCo shareholders.

"Furthermore, the board of Tawana recognises that the value of the Cowan, Yallari and Mofe Creek projects may be better recognised by the market by demerging these assets from Tawana to form a new standalone exploration company.

"Following the proposed transaction, both

"Tawana recognises that the value of the Cowan, Yallari and Mofe Creek projects may be better recognised by the market by demerging these assets from Tawana."

companies, Tawana and SpinCo, will be better placed to advance their respective asset portfolios, which are at different stages of maturity.

"Demerging the prospective assets should unlock better value for SpinCo shareholders."



PROK

TRUST THE NUMBERS

PROK CONVEYOR COMPONENTS PARTS AND SERVICE YOU CAN COUNT ON

PROK has a long history of manufacturing quality conveyor components for local and international markets dating back to 1880.

PROK pioneered the development of quality conveyor pulleys and idlers in the Australasian market and we are proud of our continued support of local Australian industry and local manufacturing.

We are an expert conveyor components and conveyor systems OEM, with manufacturing facilities in Australia, Germany, Sweden, Finland, South Africa and Brazil, servicing 66 countries.

PROK Conveyor Components the reliable partner for quality conveyor components.

Quality Conveyor Components

prokcc.com | +61 8 9347 8500 | 1800 PROKCC

PROK

Thiess secures extensions



Image: BHP.

Mount Arthur Coal mine.

ELIZABETH FABRI
QLD, NSW

CIMIC Group subsidiary Thiess has secured \$375 million in contract extensions at Anglo American's Dawson South coal mine in QLD and BHP's Mount Arthur Coal mine in the Hunter Valley.

On 15 March, Thiess announced it had entered a three-year \$190 million contract to continue coal mining, overburden removal and

run of mine rehandling services at Dawsons South.

Thiess' history at the mine dates back to 1962, when it was part of the original joint venture of Thiess Peabody Mitsui Coal at the then Moura Mine.

The previous contract, starting January 2016, ran for two years and was worth an estimated \$115m.

CIMIC Group chief executive Michael Wright said the contract extension built on its long-standing relationship with Anglo

American.

"We've been working with Anglo at Dawson for eight years, and I'm pleased the relationship continues to prosper," Mr Wright said.

In late March, Thiess also entered a \$185 million contract to provide additional mining services at the Mount Arthur coal project for 15 months.

Thiess had provided load and haul services to Mount Arthur since December 2016.

The new contract extends the scope of its existing operations and includes mining overburden and coal at the southern end of the operation.

Thiess managing director Douglas Thompson said the company had a long history in the Hunter Valley dating back to the 1940s, and currently provided mining services at three mines.

"We look forward to continuing to support BHP, while creating opportunities for local jobs and local suppliers," Mr Douglas said.

Nolans moves closer to development

ELIZABETH FABRI
NORTHERN TERRITORY

ARAFURA Resources is moving closer to development of its Nolans neodymium and praseodymium (NdPr) project after awarding a key Definitive Feasibility Study (DFS) contract.

Engineering consultancy firm Hatch will take on the role as lead engineering study manager for the DFS into the NdPr project.

NdPr is a rare earth critical in the manufacture of high-performance magnets used by the automotive sector and in wind turbines.

"Having recently appointed Stewart Watkins as project manager, the company can now progress the DFS, anticipating completion by the end of this calendar year," Arafura managing director Gavin Lockyer said.

"Once that has been achieved, Arafura will be one of the few companies worldwide in a position to make a Final Investment Decision on the development of an NdPr project in what we anticipate to be a rising price environment for our products.

"We look forward to this outcome and are thrilled to have appointed such a high calibre lead engineer to assist us."

Mount Peak contracts granted

ELIZABETH FABRI
NORTHERN TERRITORY

A MCMAHON Services and Clough Projects Joint Venture will provide key engineering, procurement and construction (EPC) services to TNG's Mount Peake mine in the Northern Territory.

Mount Peake, a vanadium-titanium-iron deposit 230km north of Alice Springs, is currently in pre-development with a mining lease expected to be granted by mid-year.

As part of its JV contract, McMahon and Clough will review TNG's Definitive Feasibility Study (DFS) and evaluate preliminary construction management and procurement contracting services required for the project, together with TNG's engineering partner, German-based SMS Group.

TNG managing director Paul Burton said the miner had already established a strong relationship with SMS, and through the new agreement with Clough and McMahon it would build on and enhance that relationship.

"Having two of Australia's leading contracting groups as part of our construction consortium is a real positive for the Mount Peake Project," Mr Burton said.

Clough chief executive and managing director Peter Bennett said Clough looked forward to working with TNG on "such a significant project".

"We're embracing our status as preferred team and local delivery partner for the



Image: TNG.

Drilling at Mount Peake.

construction and installation of the process plant, along with EPC work for the project's balance of plant systems and non-process infrastructure," Mr Bennett said.

As part of the deal, McMahon will also work with indigenous contracting business Intract Australia in an effort to close the gap on Indigenous employment.

"The project will offer considerable Indigenous employment, training and long-term career paths throughout the life of the project," McMahon directors David and Andrew McMahon said.

TNG has also appointed Como Engineers to oversee key aspects of the project's construction and development.



**HAGSTROM
DRILLING**

EXPLORE MORE

WWW.HAGSTROMDRILLING.COM.AU

1800 082 200



ALROSA's Diamond Inspector can identify synthetic or treated stones.

Alrosa unveils synthetic diamond detector

CAMERON DRUMMOND
DIAMONDS

RUSSIAN diamond giant ALROSA has launched a commercial diamond detector for polished diamonds in an effort to thwart dishonest suppliers who mix lab-grown synthetic stones with natural diamonds.

The ALROSA Diamond Inspector can detect natural, synthetic and treated and non-diamond imitations such as cubic zirconia, moissanite and others.

"One of the main competitive advantages of ALROSA Diamond Inspector is the use of three optical detection methods, which give high assessment reliability," the company said in a statement.

"This know-how is protected by an international patent and provides a lower price of devices compared to peers."

According to ALROSA Diamond Scientific and Technological Centre general director Vladimir Sklyaruk, the new device is to become an inexpensive and reliable tool for professionals dealing with diamonds.

"The detector is intended primarily for the use by diamond jewellery manufacturers, jewellery stores, pawnshops [and] gemologists – according to our estimates the number of potential consumers of such devices worldwide can exceed 350 thousand," Mr Sklyaruk said.

"Unfortunately, the cases of admixing synthetic rough diamonds and polished diamonds manufactured from them have been recorded in the world's largest diamond centres.

"Our device allows you to determine quickly and with a very high degree of accuracy the true origin of a polished diamond – whether it was made from a rough diamond grown in a couple of weeks in a laboratory or manufactured from a real natural rough diamond hundreds of millions and even billions of years old."

Pyrophos goes to market

Producers could save about two-thirds on capital costs using the Pyrophos process, while benefiting from substantially lower operating costs, the CSIRO stated.



Image: Jason Parker-Burlingham.

Global phosphate producers are contending with growing production costs, lower quality reserves, and stockpiling the waste by-product phosphogypsum.

REUBEN ADAMS
NATIONAL

A NEW CSIRO-developed process designed to make low grade phosphate reserves economical to mine while reducing problematic waste by-products will be commercialised by Australian company Pyrophos.

Phosphate producers are grappling with increasing production costs, low quality reserves, and the problematic waste by-product phosphogypsum.

For every tonne of phosphate produced using

wet acid, about three tonnes of phosphogypsum waste is created; resulting in about three billion tonnes of waste being stockpiled each year, according to the CSIRO.

In contrast to wet acid, Pyrophos' new smelting-based process involves applying heat to phosphate ores, resulting in a safe gravel by-product which could be used as a road base aggregate or in Portland cement production.

The Pyrophos process also has a much smaller plant footprint than the wet acid process and replaced the more expensive sulphur with coke.

Producers could save about two-thirds on

capital costs using the Pyrophos process, while benefiting from substantially lower operating costs, CSIRO stated.

"CSIRO has developed the core IP and will be the R&D centre supporting our design engineers for our work with individual producers," Pyrophos managing director Mark Muzzin said.

"We bring industry knowledge to the partnership – from the economics, to the processes and people.

"It's now up to us to evolve the IP and convert it into commercially proven technology."

Future bright for battery tech

ELIZABETH FABRI
WA

WESTERN Australia could become the next global battery manufacturing hub as it edges closer to mining all the necessary materials for lithium-ion battery production.

Speaking at day one of the Battery Minerals Conference in Perth, Mineral Commodities business development manager Daniel Hastings said the State was expected to become "the only jurisdiction in Australia and possibly the world" producing all raw materials for battery production, including nickel sulphate, lithium carbonate and hydroxide, and potentially battery anode material such as graphite.

"We take the view – like most other companies – that the current energy revolution has just begun and the outlook for battery raw materials is extremely positive," Mr Hastings said.

"The State will soon be well positioned to entice battery manufacturers to invest in infrastructure."

Mineral Commodities is currently undertaking a pre-feasibility study into the development of its Munglinup graphite project, 100km west of Esperance.

The company has identified graphite as a commodity to watch as environmental issues in China and the average grade of Chinese deposits bodes well for demand and pricing, as well as battery producers' desire to diversify geographical sources of graphite.

Midas Engineering Group director Damian Connelly echoed Mr Hastings views and said the sector was "misjudging" the full impact that battery minerals demand will have in the short to medium term.

"Make no mistake – the demand for battery minerals will create a WA boom bigger and more sustained than the gold boom of the 1990s," Mr Connelly said.

"Make no mistake – the demand for battery minerals will create a WA boom bigger and more sustained than the gold boom of the 1990s."



Image: Supplied.

Mineral Commodities business development manager Daniel Hastings.

"The market and financial institutions are underestimating the huge disruptive change and the speed of change occurring in the technology of the battery market.

"Plans and structures put in place now will heed well for the future."

WA Mines and Petroleum minister Bill Johnston said WA was "the logical place" to establish downstream processing and manufacturing infrastructure.

"Not only are we the largest producer of lithium in the world, we are also one of the only jurisdictions possessing most of the essential minerals needed for battery manufacturing," Mr Johnston told *The Australian Mining Review*.

"WA is also a world leader in the technology to find the resources, possesses a highly skilled workforce, and the research and development capacity that is so important for the future."

Mr Johnston said the McGowan Government was in constant discussion with all corners of the industry, domestically and internationally.

"Representatives of the WA Government have recently been promoting the industry and the opportunities our State can provide in South Korea, the European Union and South Africa," Mr Johnston said.

"Jobs are the main focus for the McGowan Government and we are very keen to support and develop the emerging battery materials industry."

He said WA was already a world-leader in mining equipment technology and services (METS), with an estimated 60 per cent of global mining software produced in Perth.

"Perth is at the leading edge of scientific and technological innovation, and the McGowan Government actively promotes this to our trading partners," Mr Johnston said.



LOCKOUT STAY SAFE

GROUP LOCK BOXES OF ALL SIZES

Using a group lockout box allows you to dramatically reduce the amount of locks required on a job, limit weight on each energy point by eliminating fasteners, plus it provides a quick overview of who is still working without going to each energy point.

MULTI-FUNCTION CABLE LOCKOUTS

The MFL-2 Multi Function Cable Lockout Devices from Cirlock are very versatile devices which can be used to lock out a number of different energy sources, such as large valves, steering wheels on vehicles, a number of circuit breakers or fuse holders.



Includes: GLB-2/3, GLB-4, GLB-5, GLB-6, GLB-7, GLB-8
GLB-6 and GLB-8 are not made in Australia

MFL-2

sales@cirlock.com.au F +61 7 5445 8612 T 07 5445 2910

Visit Cirlock Online Today

www.cirlock.com.au



A leading provider of managed labour, staffing and training services.

We recruit, deploy, manage and maintain a mobile workforce in excess of 15,000 per day across Australia and New Zealand.



Call us today on 13 STAFF (13 782 33)

zero/harm
programmed.com.au

IN BRIEF

Atrum receives Elan coal permits

CANADA

ATRUM Coal has received an exploration permit at its Elan South project in Alberta, Canada.

The permit, valid for two years, allows the company to conduct field exploration and drilling activities to define the projects coal resources, reserves and mining plans for that area.

Atrum managing director Max Wang said the exploration permit for Elan South as it was a significant milestone for the project.

“We have begun detailed 2018 field program planning including drilling, coal quality testing, geological modelling and analytical work, and expect to start the field work soon after site becomes accessible in May 2018,” he said.

“The recently announced successful fund raising will get Atrum fully funded for completing the Elan acquisition and the planned 2018 and 2019 exploration programs and beyond.”

Titan to acquire Andina

PERU

GOLD and base metals miner Titan Minerals will acquire unlisted public company Andina Resources as it looks to re-consolidate ownership of the Torrecillas gold project in Peru.

The deal would also help Titan avoid significant capital investment to build its own mill facilities due to the location of Andina's newly constructed Vista gold plant.

“By consolidating the Torrecillas gold project, Torrecillas gold mine, Tulin gold plant and the Vista Plant into one entity, Titan will be uniquely positioned to mill its own ore and retain the ability to process small batches of high-grade ore for artisanal miners,” Titan said.

Montepuez mining license approved

AFRICA

ASX-listed Battery Minerals is on track to begin commissioning at its Montepuez graphite project in Mozambique in November, after receiving a mining lease for Phase 1 and Phase 2 development.

Battery Minerals managing director David Flanagan said granting of the mining lease was a “significant milestone” for project, with binding offtake agreements now in place, and approval to produce at least 100,000 tonnes of graphite concentrate per annum.

“We now move to accelerate construction on all fronts and join the ranks of producers,” Mr Flanagan said.

The company said it expects to send off its first shipment in the March 2019 quarter.

Volatility fuels steel slump

CAMERON DRUMMOND
INTERNATIONAL

CHINESE steel stockpiles are growing as the country tackles industry reforms and slowing demand amid uncertainty in global markets.

The world's largest steelmaking nation is reporting an increase in steel stockpiles due to sluggish demand, which has led to decreased demand for raw steelmaking materials and a drop in iron ore prices.

Steel exports are down 30.5 per cent in 2018 compared with the same period last year.

According to data from Steelhome Consultancy, rebar inventories held by Chinese traders rose to 9.79mt during March, the highest since April 2013.

The looming possibility of a trade war between China and the US has also reduced confidence in the steel and ore markets, according to Platts.

Fortescue Metals, which produces iron ore content of between 56 per cent and 59 per cent, lowered its FY18 price guidance to 65 per cent of the average 62 per cent Fe CFR index due to sluggish Chinese demand.

During Q4 2017, Fortescue received 66 per cent of the benchmark price.

“The updated guidance reflects a slower than anticipated recovery in contractual realisations due to Chinese construction activity remaining subdued, the extension of temporary production restrictions in certain Provinces in China as well as speculation regarding the potential impact of global trade tensions,” FMG said in a statement to the ASX.

However, the miner was optimistic that market conditions would stabilise, as it expected stronger demand for lower iron



Image: Shagong.

China has increased its steel stockpiles in recent months.

content ores as steel mill margins moderate and end users looked to lower their raw material input costs.

The latest S&P Global Market Intelligence analysis shown at the 21st Annual Global Iron Ore & Steel Forecast Conference said many factors presented large-scale uncertainty for iron ore and steel markets.

“China's iron and steelmaking industries are experiencing difficulties as competition increases to determine industry champions,” S&P Global Market Intelligence senior commodity analyst Maximilian Court said.

“Supply-side reform is less encouraged by the industry's current economics than by Government policies, and these conflicting interests between Government and business will have to be carefully managed by market agents over the near term.

“We believe that short-term price

expectations for mid-grade iron ore remain skewed to the downside.

“We see prices declining this year to an annual average of \$US66 per dry metric tonne (dmt) CFR, and will continue to decline to an annual average price of around \$US64/dmt CFR by 2020.

“We continue to expect large-scale volatility as premiums on higher-grade iron ore products are contested and environmental trends, trade tensions and interest rates continue to add uncertainty to the global iron ore market.”

In the medium to long term, domestic demand, which currently accounts for about 24 per cent of steel production in China, is expected to steadily increase under China's Belt and Road Initiative – a new trade route from east to west that will require significant amounts of raw materials, including iron ore, in 2018 and beyond.

Glencore DRC projects under fire

ELIZABETH FABRI
AFRICA

GLENCORE has hosed down industrial union claims of ‘slavery-like conditions’ at its cobalt mines in the Democratic Republic of Congo (DRC).

In March, IndustriALL Global Union published a ‘fact-finding mission’ report at the request of IndustriALL affiliate TUMEC, which described harsh working environments at both the Kamoto Copper Company and Mutanda mines.

It alleged workers were only allowed 750ml of drinking water per 12-hour shift and were provided expired food and no “decent eating places” with protection against the elements.

It also claimed there was no “proper showers or ablution facilities” at the mines, and had been no salary increase for workers in five years.

The union said it had written to Glencore chief executive Ivan Glasenberg with a list of demands to improve the situation for the 15,000 workers at its DRC mines, and urged all car manufacturers – a key market for cobalt – to put pressure on Glencore to clean up its operations.

“Auto companies need to live up to their customers' expectations that the electric vehicles they sell are produced responsibly,” IndustriALL general secretary Valter Sanches said.

“Cobalt from Glencore, which is so critical for the batteries in those electric vehicles, is anything but.”

Glencore strongly rejected claims made by IndustriALL of poor working conditions.



Image: Glencore.

Copper cathodes at Mutanda.

“The statement contains a number of unfounded allegations based on factual inaccuracies,” Glencore said in an emailed statement.

“All our facilities have showers and ablution points and we are working with unions and site management to improve access and the number of points on site.”

Glencore said its workforce also had access to anonymous complaints mechanisms to raise any concerns they might have about labour practices.

“Any complaints of discrimination, harassment or unfair treatment are fully investigated at site and where appropriate reviewed by the Global Head of Human Resources,” Glencore stated.

“We have a constructive and open dialogue with the labour unions present at our operations and have had no strikes or industrial action at Mutanda or KCC.

“In the DRC, all our employees receive, in addition to basic salary and annual salary increases, free general and occupational medical care for employees and dependents, free transport to/ from the workplace, payment of children's education fees, and a monthly food allowance.”

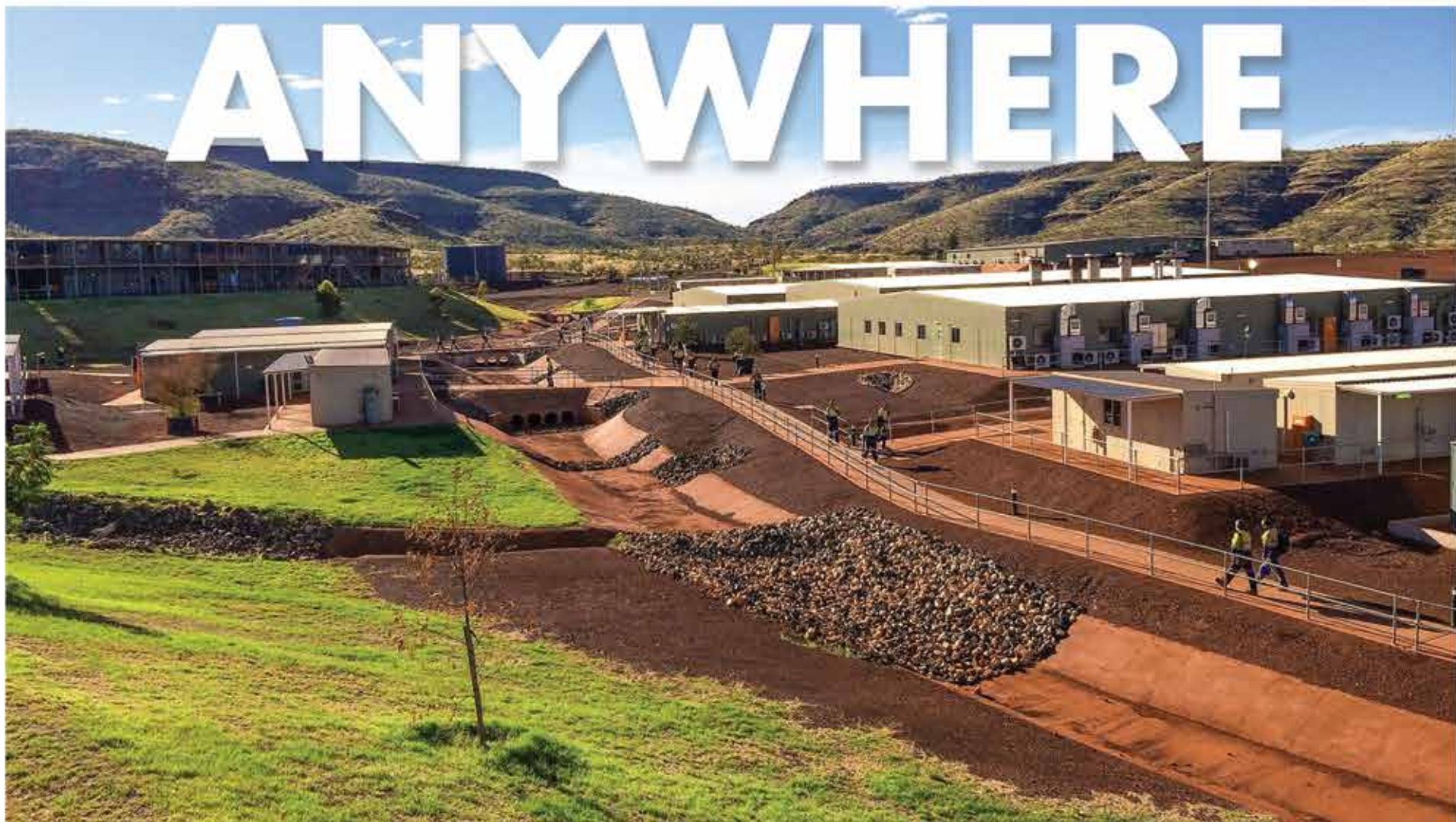
The report followed the deaths of seven workers in 2016 at Glencore's Katanga mine in DRC when the wall of an open pit mine collapsed.

Glencore said since this tragic incident the miner has conducted a full review of its practices and approaches, and introduced further safeguards to monitor and control safety risks.

“Since that incident, there have been no fatalities at KCC, while Mutanda has been fatality-free since 2012,” the company stated.

“We seek to engage with all our stakeholders in open and constructive dialogue.”

ANY VILLAGE, ANYTIME, ANYWHERE



- MINING CAMP CONSTRUCTION
- PORTABLE BUILDING INSTALLATION
- MODULAR HOUSING
- REFURBISHMENT
- RELOCATION & DEMOBILISATION
- INTERNAL & EXTERNAL MAINTENANCE



Grounded Construction Group is your remote community construction specialist.

We offer services that reach from civil scope through to commissioning of entire camps and every construction activity in between.

We provide our clients with everything from landscaping, construction, concreting, fencing and maintenance right through to hydraulic and electrical install and commissioning. We pride ourselves on delivering industry leading results – for captains of industry like Rio Tinto, FMG, Iluka Resources & Roy Hill. These are repeat customers of ours due to on time, on budget and safe project execution.

Image: Albemarle.

UNLOCKING VALUE

BEARS VS BULLS

Lithium stocks have been subjected to drops in value as plans to increase supply in Chile and forecast drops in seaborne spot prices for the commodity cause a wave of uncertainty. However, those in the industry believe bearish analysis far underestimates current and future demand.

CAMERON DRUMMOND

A BEARISH outlook for lithium from Morgan Stanley has drawn criticism from industry, after the analyst group predicted a 45 per cent fall in lithium prices by 2021.

Morgan Stanley was critical of Chile-based lithium producer SQM's expansion plans and believed oversupply would eventually decrease spot prices in the global market.

"A host of lithium projects and expansion plans — including increased production by low-cost Chile brine operator SQM — threatens to add 500,000 tonnes (t) to global lithium raw material supply by 2025, swamping forecast demand growth," Morgan Stanley said.

SQM hit back at the prediction in its Q4 earnings report in March, saying its production past 2019 would be driven by global demand and the company was not out to cause oversupply issues.

It said it would only commit to spending an initial \$US170 million to expand its annual production capacity of lithium carbonate from 48,000 tonnes (t) to 70,000t this year, and then to 100,000t by 2019.

"We will evaluate the timing for future expansions in the Salar de Atacama based on market conditions," SQM chief executive Patricio de Solminihac said.

Morgan Stanley analysts expect lithium carbonate prices to peak at about \$US13,000/t this year, before declining to about \$US7000/t by 2021.

They have also predicted a surplus of 190,000t in 2022.

"We assume that the large premium that has opened up since 2015 between China spot prices and Chile contract prices will endure only as long as the market remains tight — once large surpluses build, global prices will realign.

"China's lithium reserves are estimated at 3.2 million tonnes (mt), and while exploitation has been constrained to date by high magnesium content in brines and lack of hard rock development, this is evolving.

"Battery makers we have spoken to in China report that domestic supply is improving 'in leaps and bounds'.

"We see significant upside risk to China's domestic supply by 2025 against our base-case forecast, and expect costs to fall over that time period."

However, Australian near-term producer Pilbara Minerals disagrees with the Morgan Stanley report.

"I am firmly of the view that everyone, including Morgan Stanley, is grossly underestimating how quickly the market is moving on the demand side," Pilbara Minerals Ken Brinsden said at a mining conference in Florida.

Research group Benchmark Mineral Intelligence managing director Simon Moores, through Twitter, labelled the Morgan Stanley forecast "ridiculous".

"When you understand even the basics of lithium, cathode and battery plants, and auto majors plans you realise the Morgan Stanley scenario has a 1 per cent chance of happening," he said.

Australia's Potential

Australia is already the world's largest lithium

producer, accounting for about 60 per cent of production with several new hard rock lithium mines and processing facilities under development.

During 2017, it was also the top destination for lithium exploration with 26 per cent of exploration spending globally.

Current production comes from the world's largest lithium mine, Tianqi Lithium/Albermarle's Greenbushes; Galaxy Resources' Mt Cattlin; Mineral Resources/Jianxi Ganfeng Lithium's Mt Marion, and Tawana Resources/AMAL's Bald Hill, all in WA.

Two more mines are expected to come online this year — the Pilgangoora projects being developed by Altura Mining and Pilbara Minerals.

Currently, these projects are, or will, produce spodumene concentrate before being shipped to offshore refineries — the first stage in the lithium processing chain.

In its February report *A lithium industry in Australia*, the Association of Mining and Exploration Companies (AMEC) said there were substantial value-adding opportunities along the transformation chain from mineral extraction to end-product lithium, calling for further downstream processing and refinement of concentrates before export.

"As a result of the chemistry of lithium in concentrate, the act of processing concentrate further into battery grade product delivers a more than six-fold efficiency in transport and logistics," the report stated.

"Accordingly, by building this processing closer to the mine, value is also created by significant cost savings."

So far, the only lithium hydroxide processing plant in development is Tianqi Lithium's \$700m Kwinana facility in WA, with Stage 1 expected for completion in late 2019.

"While a current hub location is effectively emerging in Kwinana, it is interesting to imagine other possible locations," AMEC said.

"As an example for regional Australia, an estimate of the cost of construction of a production facility in the Pilbara would be in the order of 1.3 times that of an existing industrial hub (extrapolating from Regional Development Australia report on the cost of doing business in the Pilbara).

"Accordingly, a target construction cost of a 20,000 kilotonnes per annum (ktpa) facility would be in the order of \$US350m.

"This cost per ktpa would be on a par with large plants in Argentina and Bolivia, and well below smaller scale plants in Argentina and Finland."

Another factor supporting further value for local downstream facilities is Australia's accessibility to 13 out of the 14 typical reagents used in the next phase of processing, which amount to about 40 per cent of plant operating costs.

Only Soda Ash is currently imported since the closure of Penrice's Osborne plant in 2013.

"The evidence indicates that, pending detailed cost and risk analysis, any sufficiently large battery chemical plant in Australia will be globally cost effective, and would likely have more predictable per tonne operating costs (compared to brine-based lithium) due to the dependability of hard-rock supply," the report concluded.

"I am firmly of the view that everyone, including Morgan Stanley, is grossly underestimating how quickly the market is moving on the demand side."

Image: Albemarle.

Albermarle's Silver Lake lithium brine project in Nevada, USA.

"As a result of the chemistry of lithium in concentrate, the act of processing concentrate further into battery grade product delivers a more than six-fold efficiency in transport and logistics."

Image: Altura Mining.

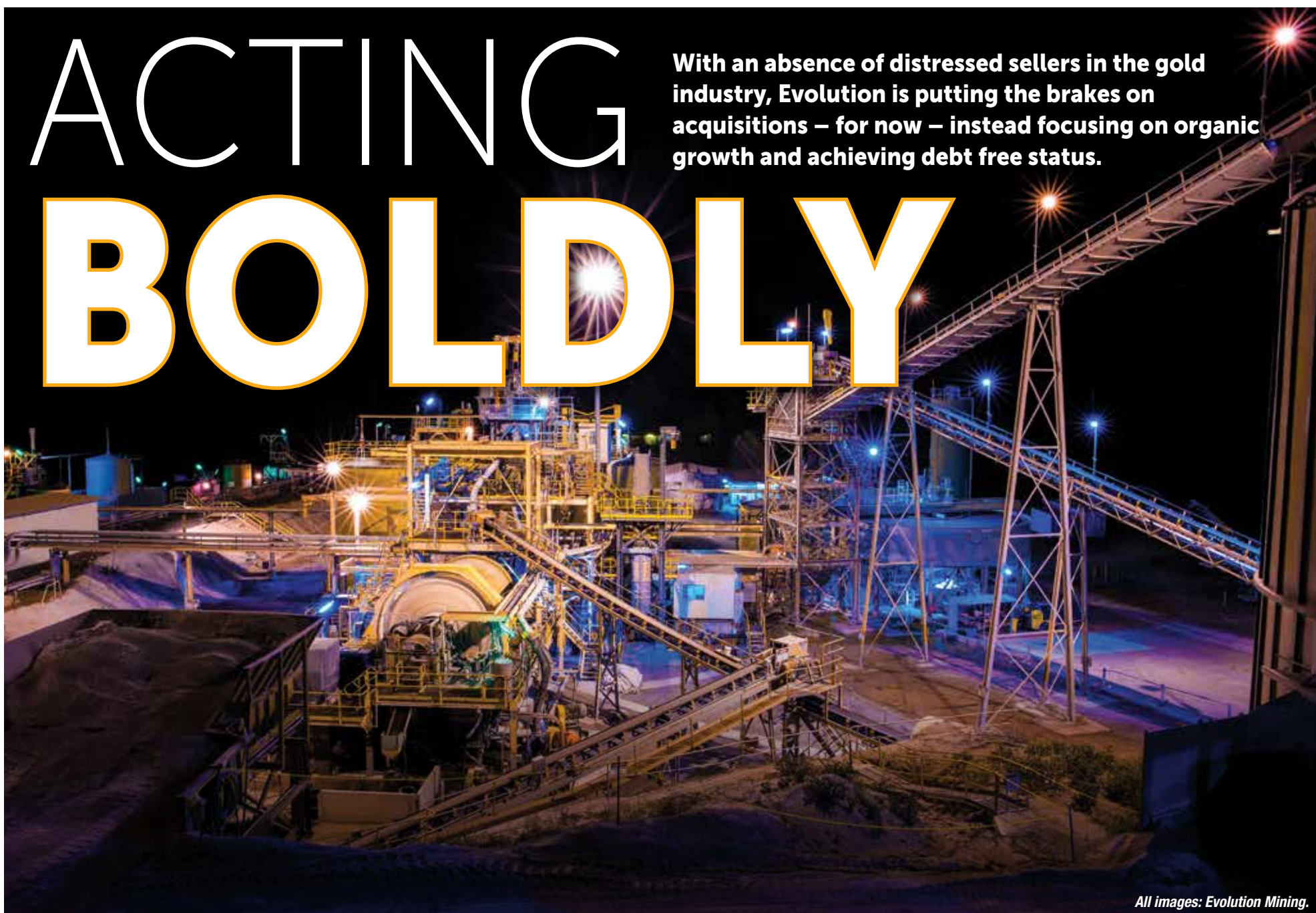
Altura Mining's Pilgangoora hard rock lithium project is targeting first sales in Q2 this year.

SPECIAL FEATURES

EVOLUTION MINING

ACTING BOLDLY

With an absence of distressed sellers in the gold industry, Evolution is putting the brakes on acquisitions – for now – instead focusing on organic growth and achieving debt free status.



All images: Evolution Mining.

ELIZABETH FABRI

IF gold and copper prices remain where they are today, Evolution Mining could be debt free by the end of the calendar year, according to executive chairman Jake Klein.

In the last two and a half years the miner has slashed more than \$687 million in debt from its balance sheet and returned \$190 million to shareholders in dividends.

What's more, group All-In Sustaining Costs (AISC) were cut by 20 per cent to \$784 per ounce in the last 12 months, making Evolution one of the lowest cost gold producers in the world.

So as Evolution nears net cash, the question is – what's next for Australia's second largest gold miner?

After an active couple of years in the M&A space inking landmark deals with larger miners, such as Glencore and Barrick Gold, Mr Klein said investors could expect "more of the same from Evolution" through its continued drive to improve the quality of the portfolio.

Naturally, an acquisition was the next possible play after the divestments of Pajingo in late 2016 and Edna May in September last year.

But acquisition opportunities that fit the bill were few and far between in the current market, with miners less motivated to sell at the right price when gold prices have been so favourable.

And even as Evolution nears a 'debt-free' position, Mr Klein was cautious of not chasing growth for growth's sake.

"We have a lens through which we are



Cowal Goldmine in NSW.

looking at everything; does it improve the quality of our portfolio (acquisition or divestment), and is it accretive to our shareholders," Mr Klein said.

"It is the second one which presents a bigger hurdle today because for it to be accretive to shareholders there are really two scenarios where it can be in our view.

"One is where there is some distress or you have a motivated seller, and that was largely in 2015 and 2016 when the larger resources companies needed to deleverage, and they sold some assets; our acquisition of Cowal and our economic interest in Ernest Henry are good examples of that.

"The second scenario is where our geological or discovery team believes there is

more upside than what is currently defined in the resources and reserves, and that is still an opportunity but it requires a geological call."

Currently, Evolution operates five wholly-owned mines in NSW, QLD and WA, as well as an economic interest in Ernest Henry in QLD.

Its roots lie in Australian soil, but the miner was not shy of venturing overseas if the right geological opportunity presented itself.

"It's difficult for us to see where we add value to a South American opportunity so that's not an area of focus," Mr Klein said.

"But we do have experience in Asia in our team, so we'd say it would have to be

for a wonderful geological opportunity to compensate for the country risk or the increased geopolitical risk.

"North America too presents an interesting opportunity because the geopolitical environment is complimentary to ours and is of an equal status.

"We have some experience in our team [in North America] but we'd be looking for a partnership or a team that is there and capable of executing on the ground there."

Organic growth

As Evolution patiently keeps an eye out for the next acquisition opportunity, it will focus on internal growth, increasing its exploration budget to \$40 million in FY18.

Mine life extensions were the biggest pillar in this strategy, especially at projects such as Cracow and Mungari where there is less time on the clock.

"We've gone from a mine life on average in our portfolio in 2014 of just over five years, to now (based on our last reserves statement) a mine life close to eight and a half years," Mr Klein said.

"We're working very hard on extending mine life and certainly replacing reserves continues to be a focus and then discovery; we're investing about \$30 million in discovery in addition to the resource and reserve definition drilling that we do as well."

Aggressive drilling campaigns continue across the board with total drilling of 39,024 metres (resource definition) and 37,417 metres (exploration) in the December quarter alone.

(CONTINUED OVER)

Discovery drilling at Cowal is also expanding a newly identified zone of mineralisation, at Mungari resource definition drilling at the north end of White Foil nears completion, and at Cracow infill drilling confirmed strong grade continuity on the Coronation-Imperial-Empire.

Out of the projects, Cowal had the longest mine life to 2032, followed by Ernest Henry, Mr Rawdon, Mt Carlton, Mungari and Cracow.

At Cowal, the company will spend about \$300 million over four years, with plans for a Stage H cutback scheduled to be complete in FY21, and a Float Tails Leach to begin commissioning in the second half of this year.

"The Float Tails Leach project will improve recoveries at Cowal by between 4 per cent and 6 per cent," Mr Klein said.

Investments in new technologies such as this will continue, he added.

"We're at the early stage of that journey, and that's what makes me optimistic that there is still tremendous opportunity in front of us," Mr Klein said.

"We are starting to use big data much more efficiently, but trying again to be focused on ensuring that we're not just overwhelmed by big data but we're capturing the right data and using that data.

"There's been areas where we have been investing. [I'm] not sure you would call it new technology, but things that are making step changes in our profitability at the mine sites, like a gravity circuit at Mt Carlton that now captures 20 per cent of the gold without it needing to be concentrated in China."

Lowered AISC costs have also been achieved through transitioning to owner-operator at some sites, and introducing a centralised procurement function that has enabled Evolution to aggregate procurement power and deliver savings.



An aerial view of Mungari mine in WA.

Making mining attractive again

Despite the progress made internally, industry-wide issues still weigh on the company; predominantly the emerging skills gap brought on by the lack of graduates choosing a career in mining, and existing workers that have either left the industry or falling behind as technology advances.

"I think that's a huge issue for the industry as a whole," Mr Klein said.

"If you look at the number of graduates coming through mining engineering and geology; we are at crisis levels.

"I think it's incumbent on all of us in the sector and Government to work together as partners in making mining a more attractive industry and career for young people.

"For example we have a graduate program where we take on graduates; that's a start."

Speaking on International Women's Day, Mr Klein also pointed to the disparity between the number of male and female workers in mining.

"We only have 15 per cent female participation in the mining industry and obviously they represent 50 per cent of the workforce or the population, so we are missing a lot of talent," he said.

"I think it is about the attractiveness of the industry and making it a place where people feel they have a career ... because if every time there is a downturn in prices and people start getting laid off and retrenched, you're not going to win the trust of people."

Mr Klein said he has actively tried to introduce a culture where everyone in the company acts like an owner; a strategy he said attributed to recent reductions in operating costs.

"I'm not saying we have completed that journey (we still think we have more opportunity), but if you can get every person in the organisation to act like an owner and treat the business as their own, you're a long way towards getting an efficient and productive operation," he said.

"We also talk about being different and not just doing what we may have done previously, or whatever everyone else is doing.

"We talk about keeping an open mind to opportunities, and very importantly we talk about acting boldly; if you want to be different, you are going to have to act boldly.

"From my perspective we also want to be humble and not believe that the success we achieved to date is going to be sustainable without a lot of hard work and effort, and that journey is still ongoing."



BMT's technology accurately measures blast movement to determine the actual location of the ore-body post blast.

Driving efficiencies at Cowal

NATIONAL

EVOLUTION Mining's cornerstone asset, the Cowal open-pit gold mine, measures 3D blast movement to increase ore yield and mill head grade.

Prior to blasting, the team place transmitters within the blast volume, and post-blast the geology team calculate the movement vectors and move dig lines to the true post-blast locations.

Blast Movement Technologies (BMT) helps resource companies improve

profitability, recently helping Cowal increase head grade by 7 per cent.

The company's unique solution accurately measures blast movement to increase ore recovery and minimise dilution in every blast.

Implemented at more than 90 mines in 34 countries for use in all commodities, including copper, gold, iron ore, nickel, platinum, silver and zinc, the BMT solution is also the corporate standard for grade control at the top four gold producers; Barrick, Newmont, AngloGold Ashanti, and Kinross.



COWAL gold mine

- 7% head grade increase
- Improved blasting practices

Find out how blast movement monitoring can get more from your resource bmt.com.au/evolution

Blast Movement Technologies
(07) 3122 2982 | office@bmt.com.au





Explosives supplier of choice for Evolution Mining

MAXAM is currently the leading blasting solutions and services supplier to the majority of Evolution Mining's gold mine operations across Australia: Cowal Gold, Mungari White Foil, Mt Carlton and Mt Rawdon Operations.

Explosives are the primary crusher and the tool to driving value throughout a company's operations. MAXAM's premium bulk explosive, RIOFLEX is a watergel technology which is unrivalled in performance and versatility.

RIOFLEX is unique to MAXAM in the Australian market, and is more energetic, contains less water content, has a greater range of densities, high water resistance, superior inhibiting and cross-linking properties. This makes RIOFLEX far superior to rival emulsion products.

maxam.net

COOKING WITH GAS

Fresh from completing a \$US120 million expansion at its Tanami operation, Newmont is spending big on a new power project that will see Tanami shift to natural gas from a current reliance on diesel fuel.



All Images: Newmont.

Newmont has expanded mill capacity from 2.3 million tonnes to 2.6 million tonnes per year.



A community school visit to the site in 2017.

ELIZABETH FABRI

NEWMONT has a lot to be proud of at its Tanami gold mine in the Northern Territory.

Since 2012, Tanami has more than doubled gold production and cut costs by two thirds.

In August, the miner completed a mine expansion to increase production by 80,000 ounces per year, lower all-in sustaining costs to between \$US700/oz and \$US750/oz, and add a further three years to mine life.

Newmont's Australia production was now expected to reach between 1.5 million ounces and 1.7moz in 2018, in part helped by this increased output at Tanami (FY18 production of between 425,000oz -475,000oz of gold).

But a spell of wet weather during early 2017 brought other operational issues to the fore.

Up until now, Tanami – which is one of the most remote mines in the country – has been powered by diesel generators, like many of its peers. But the fuel can only be trucked to the mine, meaning if roads are blocked no diesel could reach the operation.

This was what happened in January and February last year, when widespread rain hit the Territory.

Newmont Australia project director Francois Hardy said travel restrictions prevented essential deliveries of fuel to the site and led to a ramp down in mining and processing activities.

“Due to the remoteness of the site, there

is always between six and eight weeks' worth of diesel stocks; historically this has been adequate," Mr Hardy said.

"Tanami experienced the wettest December, January and February on record, with 743.4mm of rain between 21 December 2016 and 10 February 2017. The first 39 days of 2017 exceeded the average annual rainfall for the region."

The incident was unlikely to occur again in the near term, but as Newmont looks to further expand the underground operations, more power and greater energy security will be required for Tanami.

Power Plans

Newmont recently unveiled plans to build a new Tanami power project that will see a shift from its current reliance on diesel fuel to natural gas.

Newmont's plans involve building two power stations and a 450km natural gas pipeline connecting the Tanami site to the Amadeus Gas Pipeline.

Besides offering power reliability during extreme weather events, the move to gas would also increase available power, lower power costs by about 20 per cent beginning in 2019, and reduce carbon emissions by 20 per cent.

"The project is expected to result in net cash savings of approximately \$34 per ounce beginning in 2019," Mr Hardy said.

"Capital costs are estimated at between \$225 million and \$275 million, with annual cash lease payments over a 10 year term beginning in 2019 with approximately \$10 million of owner's costs paid in 2018.

"The project IRR is expected to be greater than 50 percent at \$0.75 AUD."

While the project was still in the permitting stage, contracts have been awarded to Power and Water Corporation for the gas supply, AGIT for the gas



Roads leading to Tanami during the 2017 rainfall event.

transport, and a power purchase agreement has been signed with Zenith.

Mr Hardy said the project's existing diesel power stations will be decommissioned following the build, and the two new power stations will include hybrid generators, that can run on either gas or diesel.

Further ahead, Mr Hardy flagged solar power an additional future source of power for the mine.

"Newmont will continue to investigate new technologies and alternatives, this includes the opportunity to utilise solar power, particularly at Tanami where the remote nature of the site means it needs to

“Due to the remoteness of the site, there is always between six and eight weeks’ worth of diesel stocks; historically this has been adequate.”

be self-sufficient," he said.

Tanami Expansion 2

A second expansion at Tanami was also in the planning stages.

(CONTINUED OVER)



More information can be found at: www.abco.net.au.

Quality water systems

WA

ANDREW Brown & Co (ABCO) was established in 1997 and has grown to become one of the largest privately owned water and wastewater treatment specialists in Australia.

With more than 20 years of experience, the ABCO Group has a diverse range of clients, both in Australia and overseas.

ABCO systems are designed and manufactured in-house, which allows

clients direct access to the design and manufacturing team.

"Our capacity to optimise the project cost, quality and schedule ensures we deliver the best possible 'whole of life' outcome to our clients," ABCO operations manager Kevin Roberts said.

"Some of our recent projects include the supply and install of a pump station and 1000kL ground water tank at Newmont's Tanami mining camp, and the replacement of tank liners to a waste water treatment plant and 400kL tank at the site."

WATER MANAGEMENT IN MINING

ABCO is an industry leader in the design, manufacture, installation, and commissioning of all water and wastewater related products in Australia.

OUR SERVICES

- Water supply pumping and sterilization treatment plants
- Reverse Osmosis (RO) water purification
- Ultra-Filtration (UF) water filtration
- Equipping of water bores, pipelines, and other water sources
- All forms and size of water tanks; galvanized steel, fiberglass, polypropylene up to 2 ML capacity
- Fire water tanks and Fire pumping systems

- Wastewater treatment plants, RBC, AS, IDEA, SBR and Trickle Filter.
- All pumping stations including sewerage and water transfer
- Vacuum and Pressure Sewerage Systems
- Effluent disposal
- Sludge handling, sludge thickening, sludge drying and Sludge Geo Bags
- Oily water separation
- Acid Mine Drainage
- Rental Systems, custom manufactured or from our ABCO fleet along with ex rental systems for sale.

(08) 9399 1662

sales@abco.net.au

abco.net.au



“While in pre-feasibility stage, Tanami Expansion 2 holds the potential to extend mine life by 12 years to 2040, for an investment of between \$US600 million and \$US700 million.”

The Tanami expansion launch in August 2017.

Tanami Expansion 2 focuses on maximising value from the deeper orebody (from 1200m to 2600m below surface) to significantly increase mine life.

It would involve construction of a vertical shaft and associated ventilation and optimising processing plant capacity.

Pre-feasibility studies were now

underway to improve orebody knowledge and optimise the approach to material handling, ventilation, and refrigeration.

“The project will be a significant investment in extending the life of the mine,” Mr Hardy said.

“While in pre-feasibility stage, Tanami Expansion 2 holds the potential to extend

mine life by 12 years to 2040, for an investment of between \$600 million and \$700 million.”

Newmont said it expected to reach a funding decision in the second half of 2019, with construction to take about two years.

Mr Hardy said Newmont will continue to invest in exploration across the region, and

if satellite deposits were found “would look to permitting them if economically viable”.

“Newmont has built Tanami into a long life, low cost operation, leveraged for future growth,” he said.

“It’s a key asset in Newmont’s portfolio and has been a significant contributor to the Northern Territory since 2002.”

TOUGH TANKS... TOUGH INDUSTRY

SPECIALISED SOLUTIONS WHERE EXPERIENCE COUNTS

Tanks West manufacture storage solutions for a variety of mining applications from camps to extraction sites and processing plants. We have delivered specialised storage options to the West Australian mining and industrial sectors for over 20 years and have extensive experience in a wide range of liquid storage, from water to chemical solutions.

Engineered to meet your specifications, storage tanks are certified to meet the requirements of Region “D” Cyclonic rating and are available in sizes from 1–65 cubic metres.

Our technical staff are on-hand to assist with your next project.

Call 1800 812 677

TANKS WEST

WE BUILD THE BEST

Factory: 5-7 Uppsala Place, Canning Vale
info@tankswest.com.au | 1800 812 677

tankswest.com.au  



Swick named contractor of the year



Swick Mining Services is proud to be the drilling contractor of choice for Newmont's Tanami operations.

NATIONAL

ONE of Australia's largest drilling contractors, Swick Mining Services has been named as *Mining Contractor of the Year* at the 2018 Australia's Mining Monthly Awards.

The top spot has come at a time where Swick has successfully positioned itself in the industry as a premium provider of

mineral drilling services. The *Mining Contractor of the Year* category recognises contractors that add consistent value to their clients projects or find ways to deliver real cost savings, productivity gains, and industry leading safety benefits.

Swick Mining Services managing director Kent Swick said the company's approach to manufacturing best-practice drill rigs and developing unique drilling practices has

set industry benchmarks for productivity, value, safety and versatility.

"Our unique, jumbo-mounted diamond drill rigs provide significant productivity and safety improvements over standard drill rigs, and are considerably more versatile in their drilling capabilities," Mr Swick said.

Having established its cornerstone underground diamond drilling division in 2004, Swick is fast approaching an amazing milestone of drilling its 10 millionth metre of

diamond core, which is expected to be drilled sometime in July 2018.

Swick has also recently achieved a remarkable result at Newmont's Tanami operations in the Northern Territory, drilling a staggering 1.5 million metres since operations commenced in 2007.

Starting with two drill rigs, Swick now operates eight rigs with another rig expected to mobilise to site in April.

CONGRATULATIONS SWICK

2018 Mining Contractor of the Year.

Innovative • Productive • Safe

swickmining.com

NEW YEAR'S RESOLUTION

Resolute Mining is in a period of transition as it charges ahead with expansions at its Ravenswood mine in QLD and Syama project in Mali.



The Ravenswood mine is 95km south-west of Townsville, QLD.

ELIZABETH FABRI

IN the first half of FY18, Resolute Mining saw a 40 per cent slide in net profit to \$38 million.

For the six months ending 31 December, the miner produced 142,748 ounces of gold at an All-In Sustaining Cost (AISC) of \$1395/oz; a sharp rise from FY17 AISC of \$1132/oz.

"Obviously that number [AISC] represents the reality that we had a challenging first half of the year," Resolute Mining managing director and chief executive John Welborn said in a February conference call.

"We always knew it was going to be a more difficult first half with the decline in stockpile grade at Syama and the transition we're making from underground mining at Ravenswood to a larger low grade operation.

"The narrative around the first half is

we are investing in a long term business."

Despite the challenging start, Resolute remained committed to its FY18 guidance of 300,000oz at an AISC of \$1280.

"Clearly the performance in the two quarters we have left are going to be significant," Mr Welborn said.

Mine Expansions

Increased performance will be accelerated through Resolute's two expansion projects.

At Syama, Resolute was undertaking a sublevel cave development to allow full underground mining to begin in December.

Over the coming months, cash costs and AISC were also expected to improve when a major roaster shut is completed, and production and circuit availability increases.

In the first half, Syama total

underground mineral resources improved by 39 per cent to 5.7 million ounces at 3.2 grams per tonne of gold.

"This significant upgrade, in addition to our investigations of the advantages of autonomous trucking and bogging, has identified further opportunities to enhance our development plans at Syama and contemplate future expansion of production rates," Mr Welborn said.

Resolute has also highlighted satellite underground mining opportunities, such as Nafolo, Tabakoroni and BA-01, to complement the existing Syama mine plan.

Meanwhile at Ravenswood, the miner has established a 13-year mine life based on a plan to return to a large-scale open pit mining operation at Nolans East, Sarsfield and Buck Reef West, as underground mining at Mt Wright comes to an end.

In November, Resolute entered a gold hedge to support the expansion work

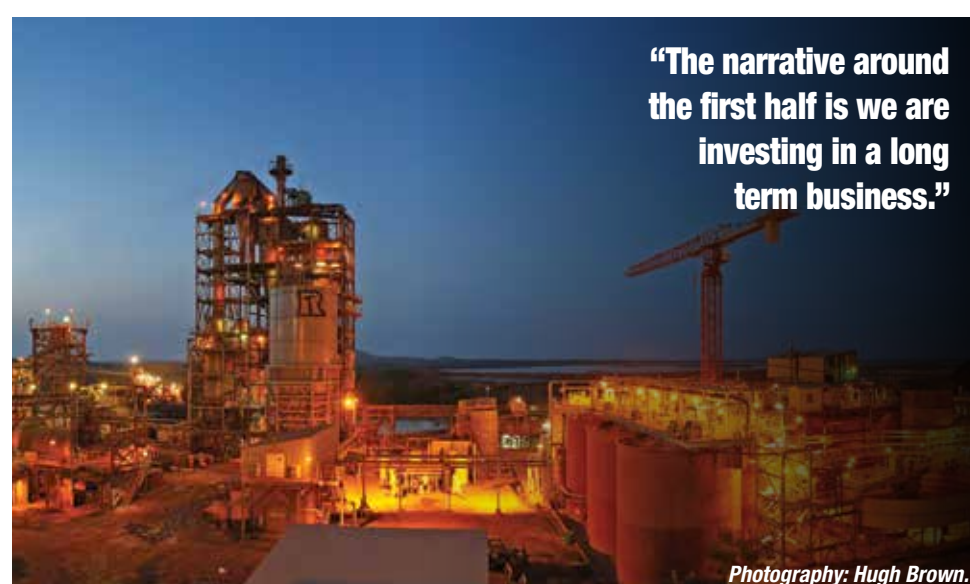
program, including 72,000oz of gold at an average price of \$1715/oz from December 2017 to May 2019; a significant premium above Resolute's budgeted gold price of \$1600/oz.

Resolute has since progressed approvals to begin an optimised feasibility study to modify mining schedules and tailings disposal strategies with the aim of reducing operating costs and project capital costs.

The study also includes an expansion of the processing capacity to the previous rate of 5 million tonnes per annum.

Mr Welborn said the miner maintained a "very conservative" balance sheet with all signs pointing towards strong cash reserves even after project completion.

"In terms of our forward cash flow we continue to show we will have a significant cash reserves even if we complete all of our existing projects on budget and on time, and the important thing is that all of those projects are



Photography: Hugh Brown.

currently on budget,” he said.
“There is a buffer there that we maintain.
“We also continue to look at how we are going to expand and when.”

Advancing Bibiani

Resolute’s next step was bringing its Bibiani project in Ghana into production.
The West African mine is set to add a further 100,000oz of gold per annum to the miner’s production profile at an AISC of below \$US858/oz.
In the December quarter, Resolute announced an updated Mineral Resource estimate of 21.7 million tonnes at 3.6 grams per tonne of gold for the project; a 40 per cent increase on the previous estimate.
The resource was now being

incorporated into an updated feasibility study, which was scheduled to be complete in the March quarter.
While timing on the project was still yet to be finalised, Bibiani has a short lead time to production of only 9 months from commencement at a capital cost of \$US72 million, including \$US29 million of underground mining equipment.
Like Syama and Ravenswood, Bibiani was expected to run for an estimated 10-years, in line with the miner’s strategy of pursuing long-life assets.
“We’re aiming to have at least a decade at Bibiani,” Mr Welborn said.
“That is a fantastic place to focus on as we distinguish ourselves by having long life mines that we believe have a lot more beyond them then we already see.
“Our key focus at the moment is the development programs that we have got on but we continue to invest in

exploration, both on our own account and also [through] investing in juniors.”
Gold Industry Consolidation
Mr Welborn said in the current gold price environment of near \$1700 per ounce, it was “likely there was going to be some consolidation” in the gold industry.
“From Resolute’s perspective we remain very committed to our existing assets and our current development profile,” he said.
“We have an industry leading organic growth profile at our existing operating assets, and a very interesting pipeline, most obviously represented by Bibiani, and the investments we continue to make in juniors and our own exploration program.”
In January the miner agreed to pour \$2

million into the ASX listing of Mako Gold, which has various exploration projects in Burkina Faso and Cote d’Ivoire.
Last year, the miner also purchased a 5 per cent stake in West African gold explorer Oklo Resources, which recently confirmed extensions to primary gold mineralisation at its Seko prospect within its Dandoko project.
Mr Welborn said Resolute remained “very ambitious” and it was a “very interesting time to be in the gold space”.
“The reality is with a completely unleveraged balance sheet we have significant capacity for other investments, and as we’ve shown in the past we have a range of bankers that have supported us with debt facilities, which we currently don’t have in place,” he said.
“Do we have the capacity for more ambitious acquisitions or transactions? We do.”



Bibiani was Resolute’s next development project.



Syama mine in Mali, West Africa.

Crushing records tumble at Syama

INTERNATIONAL

PARTNERING with Resolute to increase availability and operability at Syama, Primero Group is an Australian engineering group with a global reach.
While a number of incremental upgrades have been undertaken at the West African gold mine, the main project has been the sulphide crusher upgrade where Primero replaced the primary crusher, removed the secondary crusher, modified and installed a new product screen, upgraded a conveyor and installed a flop gate for steel ejection.
In the six months following the upgrade Resolute achieved record crushed tonnes at Syama and has been improving ever since.
The project’s success was attributed to a collaborative effort by marrying blue sky production ambition with innovative engineering solutions to deliver optimal project outcomes.
Beyond the sulphide crusher



The Syama project.

upgrades, Primero debottlenecked the oxide circuit, installed a sulphide trash screen and retrofit HP5 crushers, and designed Resolute’s underground pump station.
During the underground pump station design Primero utilised in-house virtual reality equipment to simulate the layout prior to construction.
Primero’s project delivery model is to provide mining customers with turnkey design, construction and commissioning solutions.

Its consulting and design team provide world-class engineering services across commodities and industry sectors and pride themselves on rising to the engineering challenges of clients to optimise plant productivity.

GLOBAL REACH

With its Australian assets in production, lithium-focused Galaxy Resources is progressing hard rock exploration in Canada and brine development in Argentina as it seeks to become a globally significant producer of the hot commodity.

All images: Galaxy Resources.

CAMERON DRUMMOND

GALAXY Resources has production facilities, hard rock mines and brine assets in Australia, Canada and Argentina. It owns and operates the James Bay lithium pegmatite project in Quebec, Canada and the Mt Cattlin mine in Ravensthorpe, WA, which is currently producing spodumene and tantalum concentrate. It is also advancing plans to develop the Sal De Vida lithium and potash brine project in Argentina.

Demand for lithium-ion batteries is forecast to increase, and Galaxy is working to position itself at the forefront of supply to the major markets of China, North America and Europe.

Mt Cattlin

Galaxy's maiden shipment of 10,000 dry metric tonnes (dmt) of lithium concentrate departed Esperance Port bound for China on 2 January last year.

During Q1 2017 Galaxy produced 23,467t of concentrate, in line with its ramp up schedule as the miner worked to finish plant commissioning at Mt Cattlin.

In February, a 50-year rainfall event in Great Southern Region of WA caused severe flooding and the temporary suspension of

mining activities, as well as temporarily cutting off key transport routes to the Esperance Port.

This, however, did not affect Galaxy's second shipment of 13,700dmt aboard the *M.V. Blessing* headed for China.

Over the rest of the year, production at Mt Cattlin steadily increased with 32,998t produced in Q2, 47,075t in Q3, and grew 11 per cent quarter-on-quarter for a record 52,139t during Q4 – above nameplate capacity – for an annual total of 155,679t.

December quarterly earnings from 58,094dmt of lithium concentrate generated an EBITDA of \$34.2m at an average realised sale price of \$US868 per tonne.

The company also entered into new, binding long term offtake contracts with multiple customers throughout Asia for 100 per cent of planned production from Mt Cattlin for five years, which commenced at the start of the year.

Pricing is based on either a cost plus insurance and freight (CIF) or cost plus freight (CFR) basis and will be subject to an annual pricing review between Galaxy and its customers in Q4 of each calendar year.

Galaxy managing director Anthony Tse said Mt Cattlin had experienced “very strong” interest from a wide range of current and new buyers after the consistent delivery of product throughout 2017, with significant increasing demand over the

five-year contract term.

“The Mt Cattlin team will be working on a number of initiatives through the first half of 2018, to provide its customers with the increasing volume and consistent quality of product they require as they continue to expand their own operations,” Mr Tse said.

“These agreements also underscore the strong relationship Galaxy has with its customers and consolidates long-term partnerships with a number of the larger and high quality chemical converters in Asia, who are in turn suppliers into the fast-growing lithium battery materials sector in that market.”

Technical evaluations of the construction and implementation of an ultra-fines DMS circuit, a secondary float re-crush circuit and a final product optical sorter were completed during the quarter that would support increased recoveries to 70 to 75 per cent, compared with average realised recoveries during 2017 of 56 per cent.

The construction and commissioning of the process plant improvements are planned for completion during early Q3 2018.

On the exploration front, Galaxy has commenced brownfield and greenfield drilling campaigns focused on proving up further resources, including pegmatite deposits east of Floater Road and southwest of the existing open pit.

James Bay

In March 2017 Galaxy begun a drilling campaign at its James Bay hard rock lithium project in Quebec to upgrade the resource estimate. The completed campaign showed intercepts of up to 1.78 per cent from up to 300m below the surface.

By December, Galaxy had almost doubled the mineral resources at James Bay to 40.8 million tonnes (mt) grading 1.4 per cent for 571,200t of lithium concentrate.

Galaxy managing director Anthony Tse said the resource increase confirmed James Bay as a world class hard rock lithium asset, as highlighted by the grade, quality and scalability of the deposit.

“One of the key attributes of the James Bay project is that due to its high grade, scale, low stripping ratio and superior location, it will be one of the lowest cost hard rock lithium projects in the world,” he said.

“The pegmatite system is substantial in size and the deposit remains open at depth and also open to the east, which offers significant potential for growth, both in terms of the resource and ultimately future ore reserve.

“This, combined with its strategic location and proximity to local infrastructure means that the project has very strong development fundamentals.



From above: The Mt Cattlin processing plant.



A diamond drill rig at James Bay, Quebec.



Piacentini&Son

Proud Service Providers to
Galaxy Resources



Piacentini&Son

Ph: (08) 9780 8900 PO Box 308, Bunbury WA 6231
www.piacentini.com.au

“Galaxy will now advance the studies necessary for the development of a mine and concentrate operations at James Bay, as well as the planned downstream lithium conversion facility to be located in Quebec Province.

“The experience we have gained with the restart of the highly successful hard rock operations at Mt Cattlin in WA will be utilised extensively to assist with the development of the James Bay project.”

Sal De Vida

Nestled in what is known as the “Lithium Triangle” – home to 60 per cent of the world’s lithium from brines – Galaxy’s \$US1.4 billion Sal De Vida project in Argentina has a reserve estimate of 1.1mt of lithium carbonate equivalent and 4.2mt of potash.

According to a 2013 definitive feasibility study, this would equate to an annualised production of 25,000t of lithium carbonate and 95,000t of potash over a 40 year mine life.

A revision of the study in 2016 showed Sal De Vida would have average annual revenues of \$US354m and an operating cashflow of \$US273m before tax.

At the start of last year, Galaxy weighed up the prospect of selling a 30 to 40 per cent stake in the project to reduce Galaxy’s share of the capital cost and provide funding for the remaining portion of an estimated \$US376m development bill.

However, a month later the miner went to market instead, raising \$61m for “funding flexibility” for the development of both its Sal De Vida and James Bay projects.

Galaxy conducted initial activities at Sal De Vida during Q1 2017, including drilling two deep production wells to feed brine into



Sal De Vida is located in the South American lithium triangle.

test ponds and a third exploratory well to extend the brine reservoir.

In its December quarterly, the company said planning had commenced for the test evaporation pond and a continuous pilot plant to be operational during 2018.

“This larger scale test environment will provide data to further validate process design parameters which form a key element of the feasibility study work,” the company stated.

“Pond construction will be largely undertaken utilising Galaxy personnel, which will provide an opportunity to train and upgrade the skills of the local workforce, whilst readying the team for future full scale production.”

Primero follows Galaxy into Canada



Primero has opened a Canadian office to continue its successful relationship with Galaxy at its James Bay lithium project.

INTERNATIONAL

PRIMERO Group are a leading provider of mineral processing solutions to the global resources industry and are excited to announce the establishment of a Canadian office to better service the needs of its American clients.

Led by Primero general manager Jacques Parent, the Canadian team specialise in process design and, in time, will locally construct and service mining infrastructure projects.

Primero’s Canadian ambitions crystallised when the company was awarded Galaxy’s James Bay definitive feasibility study for both the upstream mine site processing facility, as well as working on the test work and scoping level requirements for a downstream conversion facility.

Scheduled for completion in 2018, Primero were awarded the studies after successfully rendering takeover construction and commissioning support at Mt Cattlin.

“It’s an exciting achievement for the business as we heighten our commitment to becoming a truly global organisation,”

Primero managing director Cameron Henry said.

“The move has been well received and our recognition of becoming a bankable alternative to the tier 1 service providers is what we set out to achieve.”

Primero’s project assessment, engineering study and technical due diligence services help projects navigate their way from concept to operation.

By partnering through the pre-feasibility, bankable feasibility, economic analysis and preliminary design stages of a project, the company’s study teams facilitate informed decision making throughout the financial investment decision and approval process.

Its multi-disciplinary engineering team are able to draw upon metallurgical, process, mechanical, electrical, structural and civil experience when evaluating a projects technical and commercial viability.

As a designer, constructor and operator, Primero approaches every study with the end in mind - ensuring that constructability, operability, affordability and safety remain priorities when providing development options.

All images: Tawana Resources.

NEXT CAB OFF THE RANK

Australia's newest lithium mine, the Bald Hill joint venture, kicked off production in March. With a burgeoning electric vehicle market spearheading demand for lithium-ion batteries, Tawana Resources is already pushing full steam ahead with expansion plans.

CAMERON DRUMMOND

LITHIUM production has commenced at the Bald Hill lithium-tantalum mine in the Eastern Goldfields region of WA.

Bald Hill, a 50:50 joint venture (JV) between operator Tawana and Singapore-listed Alliance Mineral Assets Limited (AMAL), is the first Australian mine to commence spodumene production since Galaxy Resources' Mt Cattlin in 2016.

Bald Hill was originally a tantalum project operated by Cannington Mines between 2002 and 2005.

It was then shuttered until Tawana's JV partner AMAL refurbished the tantalum plant in 2016; however the project did not go into production due to depressed prices.

In July 2016, Tawana decided to buy into Bald Hill for \$12.5m, earning a 50 per cent stake.

The company immediately began drilling and proving up lithium resources in the area to fast track development and meet overseas demand, with tantalum becoming a secondary focus.

After a preliminary feasibility study (PFS) showed a maiden resource of 18.9 million tonnes grading at 1.18 per cent Li₂O, the JV decided to go straight into construction, skipping the next traditional step of undertaking a definitive feasibility study (DFS) prior to development.

"We didn't go beyond the PFS because the project's economics were so strong and we felt it would have been a waste of time," Tawana managing director Mark Calderwood said.

At a capital cost of about \$75m – of which \$30m was spent on the refurbishment of the plant – Bald Hill is one of the lowest cost lithium mines to come online in Australia.

"The fact it was a brownfields project as a tantalum mine meant we could get the project up and running fairly quickly," Mr Calderwood said.

To help fund construction, Tawana and AMAL were prepaid a total of \$25m in an offtake agreement penned with Hong Kong-based Burwill Holdings in April 2017.

The funding was used towards meeting the remaining capital costs of Stage 1, leaving Tawana virtually debt free into production.

Under the agreement, Burwill will receive 100 per cent of Stage 1 lithium concentrate produced from Bald Hill over a five-year term at 2018 and 2019 prices of \$US880 per tonne (t).

The prepayment is interest free, and will be repaid from 20 per cent of the income from each lithium concentrate shipment until it has been repaid.

At estimated shipping volumes, Tawana expected those repayments to be finalised before the end of the year.

"Roughly monthly, we will send shipments of between 10000t and 15000t of production during 2018," Mr Calderwood said.

After 2019, shipment prices will be settled annually for the remaining three years of the contract.

Seven Months to Production

Lithium concentrate is being produced through a newly constructed and commissioned 1.2 million tonne per annum (mtpa) dense medium separation (DMS) circuit, which will be ramped up over several months to produce its nameplate capacity of 155,000tpa.

Within its first two weeks of operation, the DMS circuit performed to nameplate capacity of 162 tonnes per hour (tph), and the first of three performance tests achieved positive results.

4152 tonnes of ore was processed over a 24-hour period at an average rate of 173tph, with initial primary concentrate sampling returning a grade of 7.03 per cent spodumene and less than 1 per cent mica.

Tawana said the results were achieved on low-grade commissioning ore and the plant performance was consistent with test work results achieved in the development and design phase of the project.

"To produce concentrates with more than 6 per cent lithium oxide within the first two weeks of ore commissioning exceeds expectations given the initial low feed grade ore being used for commissioning start up," Mr Calderwood said.

"The high-quality of concentrates appears to be a testament to the favourable mineralogy-metallurgy of the Bald Hill deposit and the bespoke design of the DMS circuit."

Mr Calderwood said it was a great effort by everybody involved to take Bald Hill from maiden lithium resource to production in nine months, including only seven months of construction from the ground up.

"The focus now is to achieve steady state production from the Stage 1 DMS circuit and optimise lithium yields," he said.

He admitted that the company had felt it was in a race to develop the mine

and secure offtake agreements as soon as possible, however demand for lithium had since picked up pace and was growing exponentially.

"Previously there was a major sense of urgency when we weren't sure how deep the market was, but I believe people have realised it is a lot deeper than they anticipated," Mr Calderwood said.

The change in market sentiment has spurred the Tawana board to advance plans to increase production by installing a Stage 2 fines circuit to process stockpiled fines under 5.6mm.

For a projected capital expenditure of under \$10m, the fines circuit would boost mine production capability by an estimated 20 to 25 per cent to 220,000tpa.

The company also expects to begin shipping a minimum 600,000 pounds of tantalum concentrate from this month until the end of 2020 to German offtake partner HC Starck Group, with pricing above what had been anticipated in the PFS.

Expansion

High demand from offtake partners will drive an increase in production and exploration activities this year at Bald Hill, according to Tawana.

Speaking at Paydirt's Battery Minerals Conference in Perth last month, Mr Calderwood signalled 2018 would be a pivotal period of growing the mine's resource base and expanding production rates.

"We could easily take this project up from a 155,000tpa nameplate capacity up to 220,000tpa, and an extra DMS circuit could double that to 440,000tpa quite easily with a low capital cost."

To meet those production rates, Tawana is accelerating plans to prove up further reserves and extend Bald Hill's current mine life of just 3.6 years.

Mr Calderwood said that tenements surrounding Bald Hill had been vastly underexplored while the company was commissioning the plant and getting into production.

"It's been pretty quiet over the last six months as we first focused exploration on the existing mining license to get into production quickly," Mr Calderwood said.

"However, we are about to fire up exploration again over about 1600sqkm.

"With AMAL, we have 770sqkm locked up under the JV, and in our own right have

about another 770sqkm to explore in the region."

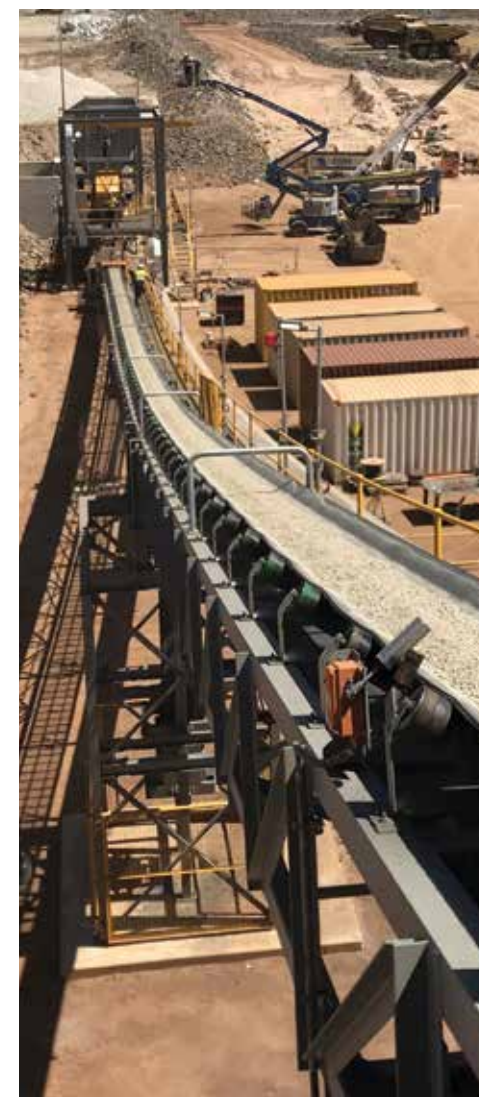
With the resource open in all directions from the plant site, the company said it would conduct an aggressive infill and extensional drilling campaign this year.

"Initial data has uncovered vast pegmatite fields covering over at least 200sqkm of the Bald Hill project area so far," Mr Calderwood said.

"Unlike gold projects, where finding enough resource tends to be an issue, these pegmatite fields can be fairly large.

"I have full confidence in our exploration team to prove up further reserves and we should be able to reveal two or three reserve upgrades this year.

"Due to the size of our project area we have at least a decade of exploration ahead of us to grow production as the market grows."



Bald Hill is Australia's fifth producing lithium operation.

Technology-led drilling solutions

NATIONAL

ESTABLISHED in 2010, JSW Australia is one of Australia's largest and safest drilling companies with operations throughout all regions of WA and across Australia.

The company offers a unique "one stop shop" for all drilling applications for the discovery and verification of all types of ore bodies, and the development and operation of mines and infrastructure projects.

JSW's ability to service all aspects of the operation from identification through to closure while integrating the latest technology and systems ensures a sustainable reduction in the projects operating expenditure.

Since inception, JSW has carried out drill and blast, mineral drilling, water and energy drilling, and provided specialist and project management services for a number of Australia's prominent 'Blue Chip' resources companies.

As a specialist in a full suite of drilling services, JSW can offer a wide range of solutions with reduced overheads, infrastructure and management costs.

JSW partners with its clients to optimise economics through customised technology, offers technology-led drilling solutions, and is an employer of choice that promotes honesty and integrity in its workforce.

JSW has a full time staff of more than 200 employees, which combined with a strong focus on structured career path development, ensures that project completion of the highest quality is offered to its clients.



JSW's REICHdrill Rig 50 currently operating at Bald Hill.

Primero achieves 7pc grade at Bald Hill



The Bald Hill processing plant.

WA

TWO weeks after the production of first concentrate at Bald Hill, Primero Group's operation and maintenance team are exceeding the nameplate production capacity of the plant and are achieving an unprecedented 7 per cent spodumene concentration.

These initial results were achieved with low grade commissioning ore.

Bald Hill is the first Australian mine to

commence spodumene production since 2016.

Ore commissioning through the newly constructed Dense Media Separation (DMS) circuit has made significant progress in the first two weeks of operation.

The circuit has exceeded expectation with nameplate capacity of 162tph being surpassed within the first two weeks of commissioning.

"This is testament to what can be achieved with a great team and a motivated client," Primero director of development Brett

Grosvenor said.

"A big thanks to the Bald Hill JV team for their support throughout the project."

Primero is an industry leader in the assessment and development of hard rock lithium projects globally.

With a deep understanding of lithium mineralogy and subsequent concentration techniques Primero were engaged by the Tawana and AMAL joint venture to complete the design, procurement, construction and

operation of the DMS circuit at their Bald Hill lithium and tantalum mine in the Eastern Goldfield region of WA.

Priorities for the JV were to gain first mover advantage over their peers and capitalise on heightened demand for spodumene concentrate by fast-tracking the project's development.

Primero were able to deliver on promise in meeting the challenging schedule, reaching practical completion and first concentrate production just nine months after the maiden resource was announced.

Cape secures key lithium contracts



Cape undertaking pipeline construction for Pilbara Minerals.

WA

CAPE is a trusted WA company that provides innovative and cost-effective solutions to businesses operating in the resources, utilities and infrastructure sectors.

Cape's core services include; mobile crushing and screening, mine site services, TSF lifecycle management, and pipelines, power and communications cable

installation.

In January the company was awarded a four-year crushing operations contract with the Bald Hill Joint Venture for Alliance Minerals Assets Limited and Tawana Resources at their Bald Hill project in the Eastern Goldfields.

Cape's contract will see it crush, stockpile and feed approximately 6 million tonnes of lithium and tantalum ore into Bald Hill's

processing plant.

Cape chief executive Peter Rowles said the contract was a significant win for the Cape business.

"The Bald Hill JV has trusted us with a critical part of their maiden operation which is a direct reflection on our innovative and cost effective capability," Mr Rowles said.

Cape has also secured contracts with other lithium providers in recent times,

including an 18km borefield pipeline for Pilbara Minerals' Pilgangoora project.

"We are delighted to secure a pipeline project within the lithium sector where we have recently been successful with crushing and screening awards," Mr Rowles said.

"Our specialist MFT20 Fast Fusion welding machines were critical in ensuring a cost-effective and efficient solution for Pilbara Minerals."



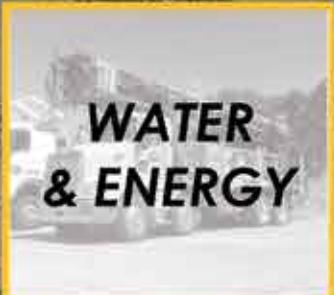
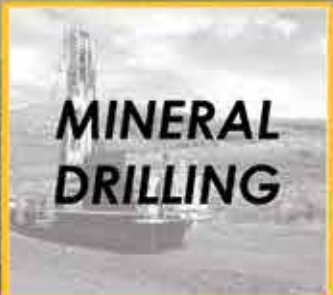
Specialists in Mining Services and Utilities Installation

Cape is a trusted and respected company with over 30 years' experience providing innovative and cost effective solutions to the resources, utilities and infrastructure sectors.

CORE SERVICES

- ▶ Crushing & Screening
- ▶ ROM Management
- ▶ TSF Construction & Maintenance
- ▶ Pipeline Construction
- ▶ Dewatering Operations
- ▶ FOC & Power Cable Installation
- ▶ Mine Site Services

Industry Leaders through Innovation



JSW offers a unique "one stop shop" for all drilling applications including:
Discovery and verification of all types of ore bodies.
Development for mines and infrastructure projects.
Production Applications for Minerals, Water, Gas & Infrastructure systems.

Partnering to optimise client economics through the provision of
customised technology led drilling solutions

www.jswaustralia.com

+61 (8) 9494 1352



Image: Rio Tinto.

BAUXITE BOOM

Growing Chinese demand is driving big investment into the bauxite-rich northwest tip of the Cape York Peninsula, with almost 30mtpa of extra supply due to come online by the end of 2019.

CAMERON DRUMMOND

AN estimated 53 per cent of Australia's vast bauxite resources come from the Cape York Peninsula in Far North QLD.

The region's operating bauxite mines are known for their high quality ore; determined not just by the aluminium content, but also by minerals such as iron oxides and titanium oxides, as well as the low amount of reactive silica which reduces processing costs.

The fundamentals of the bauxite market remain strong, helped in part by China's crackdown on illegal and environmentally damaging mining practices and declining ore grades at many Chinese mines.

These factors have led to increased Chinese bauxite imports in recent months – a record 7 million tonnes (mt) for December last year – and the opening of new provincial markets in the country.

It's projected that China's annual bauxite import requirements will rise from 40mtpa in 2014 to between 65 million tonnes per annum (mtpa) and 75mtpa by 2020.

This has spurred expansion and development of bauxite operations in Australia, with projects on the western Cape York Peninsula leading the charge.

Currently, Rio Tinto is the only producer in the region with two mining operations (South Embley and East Weipa), and a third, Amrun, coming online by the end of 2019.

Other projects are in the late development phase, including Metallica Minerals' Urquhart, Metro Mining's Bauxite Hills, and Glencore's Aurukun.

Amrun

Rio approved the \$US1.9 billion Amrun expansion on the Cape York Peninsula in 2015.

Initial output of 22.8mtpa will replace production from the depleting East Weipa mine and increasing total bauxite production by 10mtpa, with an option to further expand up to a run rate of 50mtpa.

Production and shipping from Amrun is expected to commence in the first half of 2019, ramping up to full production by the

end of that year.

The construction workforce would be 1400 people at its peak, with about 80 per cent sourced from QLD.

So far, Rio has awarded more than \$1.37bn worth of contracts to QLD suppliers, making up more than two thirds of the \$1.93bn in contracts awarded to Australian suppliers for the project to date.

More than 704 QLD businesses have been engaged directly and indirectly to supply goods and services to the site, and a total of \$218m of the commitments can also be attributed to the Western Cape York, where 70 companies have been awarded aspects of the overall project.

"From the very beginning of the Amrun project in 2015 we have been committed to prioritising Australian, and in particular

QLD companies for goods, services and expertise," Rio Amrun project director Marcia Hanrahan said.

"It is important to us that the benefits of our investment are returned to home soil and that we play an active role in developing sustainable Australian communities for the future."

QLD Premier Annastacia Palaszczuk said the significant investment in local and regional suppliers provide a tremendous boost to the State's economy.

"The Amrun project will ensure QLD businesses and their employees will continue to reap the benefits of many development opportunities for years to come," Ms Palaszczuk said.

"It is a best practice example of encouraging local and Indigenous

participation with substantial employment targets already agreed with many key suppliers."

Bauxite Hills

Metro Mining's \$36m Bauxite Hills project contains 92.2mt of bauxite reserves for an initial 17-year mine life. Projected underlying earnings out of the mine will be an estimated \$2.5 billion.

Production is on schedule to commence in April at a run rate of 2mtpa, with a planned \$36.7m expansion to increase throughput to 6mtpa by 2021.

Metro also has environmental approvals in place for an expansion of up to 10mtpa,

(CONTINUED ON PAGE 36)

"It's projected that China's annual bauxite import requirements will rise to between 65mtpa and 75mtpa by 2020, up from 40mtpa in 2014."



Image: Rio Tinto.

Amrun has created thousands of construction jobs in the region.

PROJECTS

AMRUN

Project Cost: \$1.9bn

Output: 22.8mtpa

Production Start: Late 2019

BAUXITE HILLS

Project Cost: \$36m

Output: 2mtpa - 6mtpa

Production Start: April 2018

URQUHART

Project Cost: \$1.1m

Output: 1.5mtpa

Production Start: 2018



Wave International is a consulting firm specialising in the execution of Engineering, Project Delivery and Asset Management services across Australia and internationally.

ENGINEERING

- Structural Mechanical Piping (SMP)
- Civil and infrastructure
- Process Design
- Electrical Instrumentation and Controls (EI&C)
- Land Development

ASSET MANAGEMENT

- Strategic assets management
- New and existing plant services
- Work management support and development

PROJECT DELIVERY

We are able to provide either comprehensive Project Delivery Management for an entire project or individual Project Delivery services in an advisory capacity.

- Project management
- Feasibility Studies
- Project services
- Construction management
- Environmental services



"At Wave International, we pride ourselves on always putting the client and project first. We focus on determining and designing innovative and tailored solutions that are delivered on time and within budget."

GET IN TOUCH

☎ (08) 9204 0700 (PERTH)
☎ (07) 3226 3700 (BRISBANE)

✉ enquiries@waveinternational.com
🌐 www.waveinternational.com

leaving it well-positioned to ramp up production in response to market demand.

In December last year, Metro signed a Memorandum of Understanding (MoU) with Chinese state-owned enterprise SPIC Aluminium and Electric Power Investment Co (SPIC) for the supply of 6.5mt of bauxite over four years.

This added to previous agreements with Chinese end users to cover 100 per cent of planned 2018 and 2019 production, and 90 per cent of expanded capacity in 2020 and 2021.

Metro managing director Simon Finnis said the MoU was another important milestone for the Bauxite Hills project.

“Once again this demonstrates the strong appetite for our bauxite in the Chinese refining market, and validates our mining and marketing strategy,” Mr Finnis said.

“Construction at the Bauxite Hills mine is virtually complete, and is on schedule to commence production in April 2018, following the end of the Cape York wet season.”

Urquhart & Glencore

Metallica's Urquhart bauxite project, 5km southwest of Weipa, is a fully funded 50:50 joint venture with Chinese investor Ozore Resources with a production target of between 5mtpa and 7mtpa of bauxite over an initial three to five years.

In January, Metallica took another step closer to tapping into Urquhart's three billion tonnes of undeveloped bauxite with the granting of its mining lease.

QLD Natural Resources and Mines minister Dr Anthony Lynham said the lease would allow the project to progress into operations later this year.

“The granting of this mining lease will support up to 26 jobs and allow the new mine to produce bauxite for export until 2033,” Dr Lynham said.

“Once again this demonstrates the strong appetite for our bauxite in the Chinese refining market, and validates our mining and marketing strategy.”



Australia is the world's largest bauxite producer.

The company is awaiting final approval of its haul access road, after which the mine would be up and running in between four and six weeks.

As yet exploration and expansion plans for the project are on hold until Urquhart's initial ramp up to production.

“The Urquhart bauxite project adds to the project pipeline and follows the recent granting of the mineral development license to Glencore for 283-million tonne Aurukun bauxite project,” Dr Lynham said.

The nearby Aurukun project is also starting to gear up, with QLD Government approval given to Swiss-based miner

Glencore.

In late 2017, Glencore was granted a mineral development licence or “MDL” over the Aurukun resource, which allows feasibility studies to commence.

Now the MDL has been granted, Glencore would assess the feasibility of developing the Coconut deposit through a bauxite mine that could produce up to 6mtpa over a 20 year mine life. Aurukun bauxite project director Julian Farrugia said the granting of the licence meant that Glencore could now build on its significant community engagement work.

“Since we first began regularly visiting

Aurukun four years ago, we have engaged openly and transparently with the local community and traditional owners, the Wik and Wik Way People,” Mr Farrugia said.

“We have been very pleased with the welcome and support that we've received during this time. “With the permission and assistance of the traditional owners, we've completed a number of initial on-ground environmental and technical studies during 2017 and we look forward to continuing to work with the community and our key stakeholders throughout the next phase of the project.”

Unlocking value

NATIONAL

WAVE International is an active participant in the Far North QLD bauxite industry.

For more than five years the company has worked across a number of greenfields and brownfields projects in the region, delivering feasibility studies, and covering development, infrastructure, asset management and capital works programs.

According to Wave International, a key element of unlocking value from the Far North QLD bauxite assets is robust infrastructure.

Major infrastructure includes roads, water management, and export facilities to enable the reliable operation of mining operations and delivery of product to the seaborne market.

It is in this space where Wave's expertise in enabling infrastructure and regional project delivery has supported the ongoing growth in the region.

Metro Mining's Bauxite Hills project is a prime example of where effective planning has allowed the delivery of a feasibility study and construction to an operational site within 12 months.

The Bauxite Hills project comprises a resource of 144.8 million tonnes, with a stage 1 capacity of 2 million tonnes per annum (mtpa) and ability to expand to 6mtpa.



More information can be found at: www.waveinternational.com.

In order to make this resource accessible to the international market, enabling infrastructure including 20km of haul roads, mine infrastructure, new camp facilities and a barge loading facility (including materials offloading berth) was required.

The delivery of this significant

infrastructure in such an accelerated time frame was made possible through detailed planning in the feasibility study stage.

The key elements of the planning were establishing a work breakdown structure, contracting strategy/contractor selection, engineering standards and an efficient

management team.

This same expertise that supported Metro's entrance into the market is also currently deployed to the other major bauxite projects, unlocking further economic benefit to the region.







Ontime in Full

ENZED Weipa

14 Iraci Crescent. 07 4090 5566.
Email – sales@enzedweipa.com.au





CISS CAPE INDUSTRIAL
SERVICE AND SUPPLY





14 Iraci Avenue, Weipa, Queensland 4874



07 4090 5500



www.capeindustrial.com.au







A YEAR OF DELIVERY

Iluka reported substantially higher revenues in 2017 achieved on the back of improved prices and product demand. Now, with the company's transition largely complete and a confident outlook for the period ahead, delivery is Iluka's core focus for 2018. **Reuben Adams** spoke with Iluka Resources chief financial officer and head of Strategy and Planning **Doug Warden**.

All images: Iluka Resources.



Iluka Resources chief financial officer and head of Strategy and Planning Doug Warden.

REUBEN ADAMS

Q. During Iluka's 2017 full year results conference call chief executive Tom O'Leary said "we're not looking to push prices so hard that we invoke substitution and a shrinking of the overall global demand profile, as happened earlier in the decade".

How will you ensure that price increases are sustainable, and how does this differ from Iluka's approach during the mineral sands boom a few years back?

Iluka is focussed on delivering sustainable, long-term value from all of its products, including zircon.

In 2015, the company established a zircon reference price, which provides transparency and reduces speculation about what Iluka is doing in the marketplace.

We have also invested in gaining a better understanding of the trigger points for zircon substitution and thriving.

Armed with this knowledge, the company is better able to make informed decisions on the consequences of its production and pricing actions.

Most recently, Iluka has adjusted its pricing period for zircon from quarterly to include periods of up to six months.

This 'smoothing' assists our customers in passing on changes to their customers and reduces volatility in pricing.

Q. The company noted that prior to the Sierra Rutile acquisition, Iluka's reserve base had not been replenished despite consistent exploration effort.

Do you believe there are still substantial high-grade low cost deposits

to be found, or is the focus now on operational performance to make lower quality deposits economically feasible?

To sustain and grow Iluka's business over the short to medium term, the company's resource development activities are focussed on the delivery of expansion projects at both new and existing mines.

This includes the Cataby Project in WA; the expansion of the Jacinth Ambrosia operation in South Australia; and expansions and improvements at various sites in Sierra Leone.

Iluka is also progressing a portfolio of longer-term organic growth options, with a time horizon of approximately two to five years.

These include both conventional resource development initiatives, such as the Puttalam project in Sri Lanka; as well as those based on innovation and technical development, such as the Balranald Project in NSW and the Fine Minerals Project in Victoria.

The company maintains an active exploration programme, with activities currently taking place in Africa, Kazakhstan, Canada and Australia.

As in most commodities, the likelihood of discovering the 'easy' high-grade deposits at surface has reduced.

However, innovative generation and target testing in new terrains, especially under cover, means discovery of high-grade, low-cost heavy mineral deposits remains possible and will still deliver significant value.

Q. How is tendering and construction process tracking at Cataby?

All critical path activities for Cataby are

tracking in line with Iluka’s schedule to see the project delivered in Q1 2019.

execution expected to commence in H2 2018, subject to Board approval and market conditions.

Q. What logistics are involved in relocating the 1100tpa Newman wet concentrator plant and other equipment to Cataby from Eneabba and Douglas? Is that process underway?

Separate work packages have been awarded to companies that successfully bid on the relocation of equipment from Eneabba (WA), Ouyen and Douglas (Victoria).

The use of this relocated equipment has had positive impacts on the capital cost for Cataby.

Relocation, refurbishment and installation works are on schedule, with subcontractors present on all sites.

Q. You mentioned that the positive market environment led to the restarting of Jacinth-Ambrosia in December. Was there a quicker than expected drawdown in HMC stockpiles last year?

Mining and concentrating activities at Jacinth-Ambrosia were suspended in April 2016 to accelerate HMC inventory draw-down during a period of subdued market demand.

In announcing the suspension, Iluka stated it would be for a period of 18 to 24 months.

In line with both the company’s expectations and improved market conditions, these activities recommenced in December 2017 – amounting to a suspension period of about 20 months.

Q. What mine optimisation initiatives are you looking at for Jacinth-Ambrosia?

To offset declining ore grades, Iluka is planning to expand the operation, increasing plant throughput by about 30 per cent.

The scope includes an upgrade of the wet concentrator plant; a second mining unit to handle additional ore; and a capacity increase at the site’s accommodation camp.

The expansion is expected to cost about \$40 million, with completion scheduled for Q2 2019.

A definitive feasibility study is expected to be completed by mid-2018, with project

Q. Where does Balranald fit into the company’s longer term plans after 2019?

Balranald is a large, deep, rutile-rich deposit in the northern Murray Basin, New South Wales.

Because of the deposit’s depth (approximately 60 metres underground), Iluka is pursuing an innovative, unconventional approach to this development, with a mining method based on directional drill technology.

Advantages of this approach encompass a minimal environmental footprint versus conventional mining; potentially lower capital intensity; scalable operations; and portfolio flexibility.

The company is taking a staged approach to potential production start-up in 2021.

This includes continued de-risking in 2018, with a third production trial scheduled at a cost of approximately \$25 million.

Q. Why was the Metalysis investment impaired to nil in December? What other innovation opportunities is Iluka exploring?

Metalysis is an unlisted UK-based technology company focused on solid state manufacturing of metal powder.

Iluka’s investment in this early stage technology was intended to promote new markets for our products and provide an opportunity to generate new revenues through participation in metals manufacturing.

The write down occurred following Iluka’s decision not to participate in Metalysis’ most recent round of funding.

Metalysis’ focus has shifted away from titanium, which was the original basis of Iluka’s investment in the company.

Despite this disappointing development, innovation remains a key element of Iluka’s operating model and the company is committed to exploring opportunities to improve and grow its business.

Notable innovation opportunities include the Balranald and Fine Minerals projects respectively, among other initiatives.

PROJECT SNAPSHOT

JACINTH-AMBROSIA [Eucla Basin, South Australia]

- December 2017 restart following 20 month suspension
- Restart costs: ~\$7 million
- 80 employees and 95 contractors on site
- Group zircon production of 300,000t expected in 2018
- \$40m upgrade project subject to ongoing mine optimisation work

CATABY (Perth Basin, WA)

- Mine life: 8.5 years
- Capital cost: \$250m-\$275m
- Offtake agreements secured for 85% of synthetic rutile production for minimum 4 years
- Construction period: ~18 months
- First production: H1 2019

SIERRA RUTILE (Sierra Leone)

- Resource mine life: +50 years
- Iluka’s first full year of ownership
- Significant operational improvements in 2017, including increased heavy mineral recovery and concentrate grades
- Expansion projects progressed and on track

BALRANALD (Murray Basin, VIC)

- Potential production start-up: 2021
- Large, deep, high grade rutile-rich deposit
- Progressing detailed feasibility study using innovative, unconventional underground mining method
- Planning for final \$25m field trial underway



Jacynth-Ambrosia.

“The [Jacynth-Ambrosia] expansion is expected to cost about \$40 million, with completion scheduled for Q2 2019.”



Piacentini & Son

has been in a dedicated working relationship with Iluka Resources for over 40 years, providing services in their Mining, Fixed Plant, Heavy Haulage and Rehabilitation Operations.



Piacentini & Son

Ph: (08) 9780 8900 PO Box 308, Bunbury WA 6231

www.piacentini.com.au

DIGGING DEEP

After a near death experience in 2016, Hillgrove Resources is on the rise with company finances looking healthier and a number of growth opportunities on the horizon.



Image: Hillgrove Resources. Photography Dragan Radocaj.

Kanmantoo copper mine is 55km from Adelaide in South Australia.

ELIZABETH FABRI

TWO years ago, Hillgrove Resources was in financial distress as it struggled to overcome cash shortfalls during a significant downturn in the copper market and underperformance at its flagship Kanmantoo mine.

During the \$70 million cutback of Kanmantoo the company's financial position left it with no choice but to restructure costs, which included a 10 per cent wage deferral, and renegotiated contract and creditor arrangements.

Hillgrove Resources Kanmantoo general manager Lachlan Wallace, who headed up the mine during this time, said 2016 was a challenging year.

"We had confidence that we would be able to work through it, and instigated a number of initiatives to defer cash outflow," he said.

"We met regularly with executives and the board to ensure we always maintained a solid operation."

It was not until December 2017 that Hillgrove Resources turned the corner after completing the Kanmantoo cutback.

In December, Kanmantoo produced 1785t of copper; the highest monthly production since 2014.

"We finished the pre-strip and are now mining more ore than the mill can process," Mr Wallace said.

"[We] have stockpiled in excess of 750,000t over the last three months.

"That transition has enabled us to enter into a cash generative stage of the operation which is enabling the exploration activities to kick off in earnest, prior to the completion of the existing open pit in about 2020."

Going Underground

Open pit mining is expected to continue for another 12 to 15 months, before the company considers the transition to an underground operation.

"Around the middle of 2019 the mining will wind up," Mr Wallace said.

"Processing then continues for about another 12 months post that period to process the stockpiles we have on site."

Kanmantoo's underground mine would access ore from a number of higher grade copper-gold ore zones that are extensions of the zones mined within the open pit.

The overall target for the underground operation is between 5 million tonnes and 10 million tonnes grading 1.7 to 2.2 per cent copper and 0.4 to 1g/t gold.

If this is achieved Hillgrove could produce a copper production profile similar to current output from the open pit for several years, the company said.

The first of these zones is the Nugent deposit, 180m from the open pit haul road. The Nugent zone has a target of 0.8 to 2 million tonnes grading 1.5 to 2 per cent copper and 1.5 to 2.5 g/t gold.

Mr Wallace said the company hopes to make an early start and begin a small-scale underground operation prior to the open pit closure.

"We have the intent to have the Nugent underground mine up and running prior to the conclusion of the open pit, and the remaining Kanmantoo ore zones in production sequentially thereafter to eventually enable full optimisation of the milling operations post 2020," he said.

The good news was most of the capital development required to access the new underground target was essentially already completed.

"Effectively, the existing haul road with the open pit goes down 360m from surface, so the concept has always been to utilise that haul road as if it was a decline that was already established and paid for by the open cut operation," Mr Wallace said.

"We also have the processing plant which is established and fully paid off, as well as the tailings dam which was established, permitted and paid off.

"So in terms of critical infrastructure it's all sitting there ready for a relatively low capital underground exploration

development."

Over the coming months, Hillgrove will continue drilling the various higher grade copper-gold ore zones, including Nugent, to define the down dip extensions of the deposit.

Pumped Hydro

Hillgrove is also currently assessing options to build a pumped hydro energy storage project to utilise a portion of the open pit void when mining winds up.

A summary of the project received considerable interest at the Pumped Hydro Energy Conference in Sydney in March.

Since September last year, the miner has been in discussions with energy investors to progress the opportunity, which in theory could allow the pumped hydro and underground projects to operate simultaneously.

Mr Wallace said the company had received calls from a number of parties looking to potentially invest.

However, there was still design challenges that needed to be addressed given Nugent's close proximity to the open pit.

"At the moment, we are looking at the viability of mining the underground concurrently with a pumped hydro facility in place," Mr Wallace said.

"There is a larger crown pillar that has to be left in place to enable the pumped hydro and the underground operations to run concurrently, which removes some of the potential value of an underground mine, and also increases the development costs of any underground operation, but these are not insurmountable.

"We're looking at the trade-off of running both projects simultaneously versus either project on its own to try and understand what provides best return for shareholders, and our decision will be made on that.

"We have no bias one way nor another with regard to whether its wealth generation through mining or through

realisation of the pumped hydro."

Growth Opportunities

Beyond the underground opportunities at Kanmantoo, Hillgrove plans to develop a series of satellite deposits about 60km from Kanmantoo; Kanappa and Mt Rhine.

In May 2017, Hillgrove chief geologist Peter Rolley outlined a growth plan for the company that could see it not only maintain its copper production profile for the long term but turn it into a sustainable mid-tier copper and gold producer.

Mr Rolley said the Kanappa and Mt Rhine projects were still "a couple of years away from being turned into mining sites", and the team was scheduled to commence further drilling at the sites in the middle of the year.

"Rock chip sampling has identified peak values of 34 per cent copper and 4 grams per tonne gold at Kanappa, and 13 per cent copper and 49.8g/t gold at Mt Rhine," Mr Rolley said.

"These are sensational new exploration projects for a totally new mineralisation style in the Kanmantoo area."

Once developed, the plan would be to truck the material to Kanmantoo and utilise the existing processing and tailings infrastructure.

When asked about mine life for Mt Rhine and Kanappa, Mr Rolley said it was still too early to tell, but he remained positive.

"I'm an exploration geologist so I put my optimistic hat on and believe it is similar to Kanmantoo," he said.

"We've been operating here as an open pit for about seven years and we hope the underground goes for another 10 years thereafter, and that's the kind of model we will look at achieving at both Kanappa and Mt Rhine.

"It's quite a great time to be part of the organisation with these developments happening.

"I think everyone is quite excited about moving forward."

Australia-wide equipment repair



HEMS mechanics provide a full range of repair and maintenance services to the mining industry.

NATIONAL

HEAVYEQUIP Machine Services (HEMS) offers its clients the full range of mining equipment repairs, maintenance and services. The steadily expanding company prides itself on its ability to provide customers with superior workmanship and efficient delivery of equipment repairs and ongoing maintenance.

It has a growing team of highly skilled diesel mechanics that are on call and available to work anywhere throughout Australia. HEMS has more than 15 years of collective experience within the industry, which means clients can be rest assured that the job will be conducted and completed with the highest regard for safety and professionalism. HEMS specialises in both current and late

model Caterpillar earthmoving equipment repairs, support, and diagnostics. Its team can also service Hitachi and Komatsu equipment, all other civil and mining equipment, road going vehicles and other industrial machines such as forklifts, stationary and motors. HEMS also has a successful history with total machine rebuilds and can carry out

quality work on a range of drill rigs. The company's able fleet of service vehicles are tailored to mine specifications to meet all compliance regulations. Based out of Port Adelaide, HEMS' ability to respond swiftly to clients when needed is second to none. More information can be found at: www.hemservices.com.au.

EXPERTS IN LABOUR HIRE

QUALITY - RELIABILITY



At Heavy Equip Mechanical Services, we pride ourselves on our ability to deliver a quality service to our customers in a timely and efficient manner. Our able fleet of service vehicles are tailored to mine specifications to meet all compliance regulations. Each of our service vehicles is equipped with the specialised tools needed to ensure that we are ready to respond and resolve any client mechanical issues as quickly as possible.

OUR SERVICES INCLUDE

- Labour Hire
- Mechanical Repairs
- Diagnostics
- Mining Equipment Repairs
- Heavy Duty Fitting
- Machine Rebuilds
- Road Transport Repairs
- Drill Fitting and Repairs
- Hydraulics
- Auto Electrics
- Bolier Making
- Tyre Fitting



Stock image: UC Rusal

NECESSITY: THE MOTHER OF INNOVATION

A pending trade war, high energy costs and an unreliable NEM – a trifecta of potential issues for Australia’s largest aluminium smelter at Tomago. But buoyed by strong prices, Tomago Aluminium’s strong innovation culture is driving immediate benefits and future-proofing the business.

REUBEN ADAMS

Tomago Aluminium

STRONG pricing for aluminium in 2017 was propelled by demand from Australia’s largest consumer market China (32mtpa), which grew by 5.2 per cent year-on-year.

In December, the Office of The Chief Economist forecast a 19 per cent increase in the value of Australia’s aluminium exports to \$3.8 billion for 2017-2018.

Australia’s fifth largest export commodity remained steady in the New Year, with prices continuing to rally into February to reach their highest level since 2012.

Then there was a pullback on the London Metals Exchange (LME) in March as the US Government escalated it’s ‘who blinks first’ approach to international trade, putting world markets in a tailspin.

It may be pre-emptive to panic at the prospect of US tariffs on Australian steel and aluminium – and the fallout of a full-blown trade war with China – but at the time of writing the Trump administration had downgraded Australia’s previously unqualified tariff exemption to a ‘pause’ status.

To be fair, Malcolm Turnbull and Donald Trump had both ‘confirmed’ Australia’s exemption via social media, but as AI Group chief Innes Willox put it “this on-again, off-again and on-again stuff is no way to treat a serious trading partner”.

The Tomago Aluminium (TAC) joint venture between Pacific Aluminium, Gove Aluminium Finance (CSR and AMP) and Hydro Aluminium has been a Hunter region mainstay for 35 years, operating 24 hours a day since 1983.

As chief executive of TAC, Matt Howell has said he was less alarmed by the potential fallout from tariffs, telling the *Financial Review* in March that “we’ve got good strong contracts in place”.

A more pressing concern for TAC and other Australian smelters is escalating electricity costs over the long term and – more immediately – reliability of supply.

Aluminium smelting is an energy-intensive business. TAC is Australia’s largest aluminium smelter and NSW’s largest energy user, accounting for between 10 per cent and 12 per cent of total State power demand to produce about 585,000 tonnes of aluminium every year.

From a pricing perspective, TAC is currently about four months into an 11-year hedge contract with energy provider AGL.

According to a May 2017 release from TAC JV partner CSR, based on this contract power costs would increase by about \$250 per tonne of production. Mr Howell estimated the extra cost at \$100m per year.

Smelting is also fragile business.

Reliable electricity supply is critical, and interruptions to a smelter’s supply could cause a catastrophic potline freeze in a matter of hours.

This happened in December 2016 at the Alcoa Portland smelter in Victoria, which lost about 70 per cent of cells due to a potline freeze during an extended power outage.

Portland’s future was only secured when State and Federal Governments committed to a \$240 million rescue package in January 2017.

On 10 February last year, TAC was forced to conduct a managed shutdown to cut production by 30 per cent – saving 300 megawatts (MW) – to avoid blackouts in NSW, after a number of generators failed and reduced low priced supply in NSW by 1200MW.

It took about a week for the smelter to return to normal operations.

In a July 2017 submission to the ACCC Inquiry on *Retail Electricity Supply and Pricing*, TAC claimed that 5500MW of NSW coal or gas-fired generation had exited the market in the last five years, challenging the underlying volume, and reliability, of electricity supply in the NEM.

Looking forward, TAC and other vested interests are concerned that the 2022 closure of AGL’s aging Liddell Power Station in the Hunter Valley would remove 1800MW of reliable baseload power from

the grid.

TAC’s current 11-year hedge contract with AGL is independent of what happens to Liddell.

However, AGL – prior to its acquisition of the Macquarie Generation (MacGen) assets in 2014 – worked from “conservative modelling assumptions” that major customer TAC would close in 2017, which would mean Liddell was no longer required after that period.

It was an odd assumption to make, but this also helped drive the bargain \$1.505 billion price tag for MacGen; a purchase price which valued Liddell at \$0.

By October 2014 – post acquisition – former AGL chairman Jerry Maycock correctly predicted that TAC probably would not close in 2017 as assumed.

“If the Tomago smelter remains open, then Liddell will continue to operate and will provide incremental profits to AGL over and above that assumed in our base case valuation for Macquarie Generation,” Mr Maycock said.

Soon after, AGL began aiming for a 2022 closure at Liddell. AGL proposed to replace Liddell capacity with new wind farms and gas plants, battery storage, and an upgrade to its Bayswater coal generator, which – by its own calculations – would cost 20 per cent less to produce than if Liddell’s life was extended for five years.

(CONTINUED ON PAGE 44)

Long-standing alloying specialist



KBM Affilips' Dutch headquarters.

NATIONAL

WITH three plants in the Netherlands and Belgium, KBM Affilips specialises in the production of master alloys.

The offering of this alloying specialist may be seen as the 'spice rack' for the global metal sector, since master alloys are used to change compositions and properties of the alloys in a wide variety of metal industries.

Driven by the metallurgical needs of these industries, KBM Affilips offer a full range of master alloys based on aluminium, copper, nickel, zinc and other metals, which are often tailor-made.

As such, KBM Affilips is the alloying partner of many prominent metal companies, like Tomago Aluminium.

The relationship with Tomago goes way back and has proven to be very solid over years.

Tomago is considered a most loyal, reliable and trustworthy customer as well as supplier. Although both companies are located on the different sides of the globe, the same core values are shared.

KBM Affilips strive to be the reliable and hassle-free supplier of choice; a philosophy that meets broad appreciation among the companies clientele.

Being one of the largest master alloy

producers in the world, the company ships to destinations in more than 70 countries.

Its factories are conveniently nearby the busy port of Rotterdam, making intercontinental shipments a routine operation for KBM Affilips.

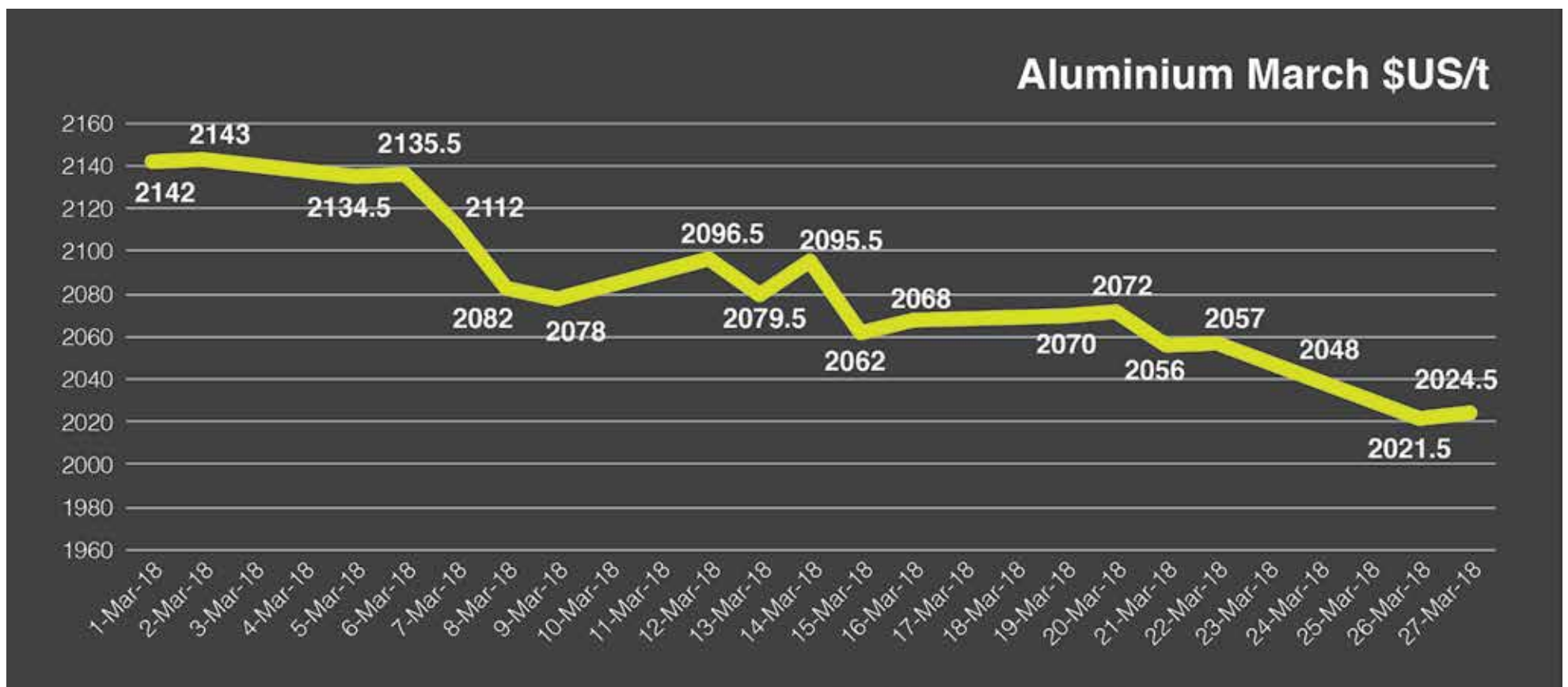
Its committed Australian agent, Farley Metals in Melbourne, ensures that customers of KBM Affilips in Australia and New Zealand are well taken care of locally as well.



www.kbmaffilips.com

Alloying partner of TOMAGO
Grainrefiners, modifiers and hardeners





Then there was a pullback on the London Metals Exchange (LME) in March but pricing for aluminium remains strong.

The Federal Government has voiced its concerns about the impacts of removing more baseload supply from the NEM.

In March this year, Federal Energy minister Josh Frydenberg said while AGL are willing to undertake all three stages of their replacement plan, the 100MW Bayswater upgrade is, according to AEMO, the “only committed resource at this point in accordance with criteria AEMO applies for determining new supply”.

“Without the implementation of AGL’s full plan or equivalent investment by others, AEMO has concluded there will

be an 850MW shortfall in dispatchable power and in their words “a high risk of load-shedding” following the closure of Liddell,” Mr Frydenberg said.

“The existence of a major shortfall in dispatchable power following Liddell’s closure would clearly present an unacceptable situation undermining the stability of the system.”

AGL stated that decisions for the investments were staged to enable flexibility to respond to the changing needs of the market and improvements in technology over the next five years.

A Culture of Innovation

Despite these potential headwinds, TAC is still a strong, profitable business buoyed by LME pricing for aluminium which – while volatile – remains about \$US150 higher than the same period last year.

According to key performance indicators, TAC had also decreased the amount of power needed to produce aluminium over the course of 2017, while metal purity was on the increase.

The smelter is constantly searching for

means to increase volumes, reduce costs and avoid loss and waste.

To facilitate this, TAC has built and maintained a strong culture of innovation that incentivises both employees and suppliers; an approach that can pay huge dividends over the long term.

For example – a number of significant projects are helping to combat escalating power costs.

One of the largest and most important of these projects is the Pacific Aluminium Low Energy Pot (PA-LE) pot, designed by the Pacific Technology Centre (PTC), which



web: instrocal.com.au
tel: 02 4952 8222
email: sales@instrocal.com.au



- Gas & Process Control Equipment
- Combustion Audits / Service / Breakdowns & Repairs
- Instrumentation & Calibrations
- Engineering & Design
- Gas Efficiency Improvements & Savings

Suppliers of



INSTROCAL.COM.AU

could deliver savings of up to \$10 million each year.

TAC has recognised that the key to a successful business is a strong supply chain, and works with suppliers to find better ways to deliver results through continuous improvement and innovation.

For the past 13 years the company has rewarded these partnerships – which include more than 500 businesses from the Hunter region alone – at its annual Supplier Event Awards.

For its 950-strong workforce, the Tomago Innovation Awards are one way TAC rewards those employees who contribute to this innovation drive. And there are many; the company’s *Wins of the Week* newsletter is replete with a number of very impressive employee-driven innovations.

The *Overall Excellence in Innovation* winner for 2017 was potline operator Nathan Bevear, who designed a lightweight, unhinged, removable aluminium door to replace the heavy hinged tapping doors on the 860 pots.

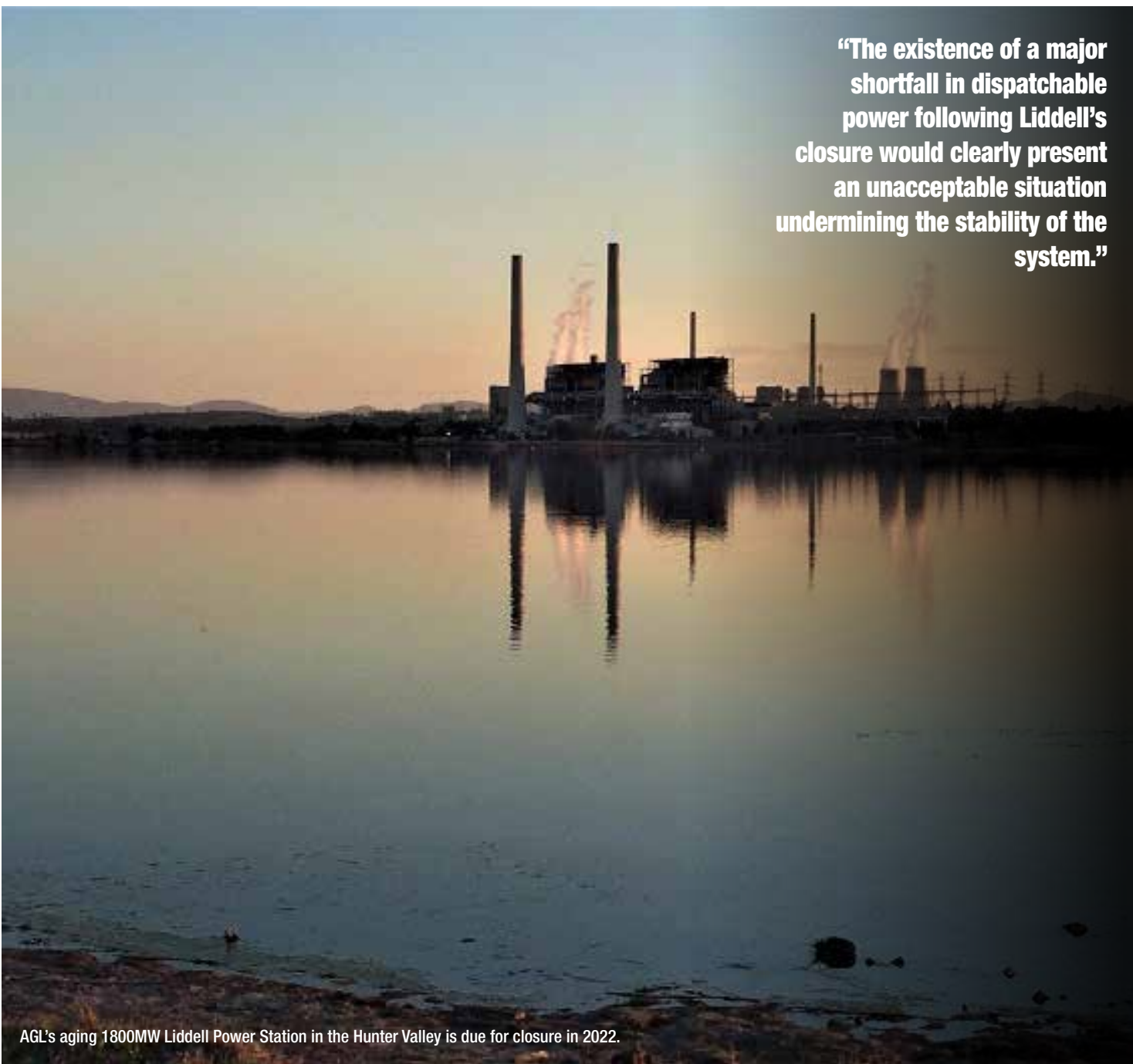
They were so successful the company has ordered at least 150 of them.

Mr Howell told the *Newcastle Herald* that Mr Bevear’s innovation increased safety for employees, reduced emissions, cut down on maintenance costs and showed Mr Bevear as “an extremely competent designer and engineer”.

“As well as the safety and health benefits that are an obvious part of the design, Nathan’s re-done doors are cheaper to manufacture than the previous doors and require less maintenance,” Mr Howell said.

Mr Howell said this innovation was a perfect example of challenging the accepted way of doing things.

“Innovation is the lifeblood of success and I’m proud to say, we have some of the best innovators in the business,” he said.



“The existence of a major shortfall in dispatchable power following Liddell’s closure would clearly present an unacceptable situation undermining the stability of the system.”

AGL’s aging 1800MW Liddell Power Station in the Hunter Valley is due for closure in 2022.



SERVICING THE HUNTER AND SURROUNDING AREAS FOR MORE THAN 30 YEARS

K&R Hydraulics is widely acknowledged within the industry as one of the Hunter region’s most experienced and reliable hydraulic sales and engineering groups. The company offers a range of services, from design and manufacture, to servicing and complete refurbishment to “as new” condition.

- Large Excavator Cylinder & Pump repair
- Hydraulic Sales, Service & Repairs
- Precision Honing
- CNC Machining
- On-Site Service



“We understand the cost of downtime to business in a very competitive marketplace and make it our goal to address critical breakdowns promptly and efficiently, as well as striving to ensure every job is delivered on time and on budget.”

“PROUDLY SUPPORTING TOMAGO ALUMINIUM”



Contact Us Now

(02) 4964 8636
sales@krhyd.com.au
www.krhyd.com.au

Extensive experience in CBF supply

NATIONAL

A CARBON bake furnace (CBF) can be described as a 'super-sized oven' which bakes carbon blocks, called "anodes" that are required in the aluminium production process.

Operating since 1974, D&N Engineering has worked extensively with Tomago & Hydro Aluminium providing solutions to assist in improving and maintaining its CBF processes.

This is why within the industry D&N are often referred to as "the carbon bake furnace specialists".

The company's extensive experience within the CBF field, has led it to design and produce a range of products that far out perform traditional models.

These products include high-quality peep hole covers, bake oven assemblies, D&N burner tips and flue baffles.

The new CBF peep hole cover anchors use advanced folding and laser techniques instead of welding.



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

This not only decreases the cost of labour but increases the strength and quality of the anchors.

With this process and other additional improvements, D&N have managed to decrease top plate heat by 14 degrees, and increase the lifespan of the peep hole covers by 2.5 months.

Traditional burner tips need regular replacement and offer little control in terms of heat output.

D&N Engineering has used its years of experience to design its new D&N burner tips, which have a more controlled flame output and an extended life cycle.

The company also produces robust flue

baffles which are light weight and fully adjustable, ensuring they can seal to any flue wall.

The design boasts changeable pads and components to extend the life of the product and save on replacement costs.

D&N also offer a range of other products that are suitable to the smelting process.



www.eng.com.au
contact@dn.eng.com.au
(02) 4952 6344

THE TRUSTED TEMPERATURE SENSOR SPECIALISTS

"We don't just sell products – we sell solutions."



Quality
ISO 9001
QEC29835



Thermowells



RTD Sensors



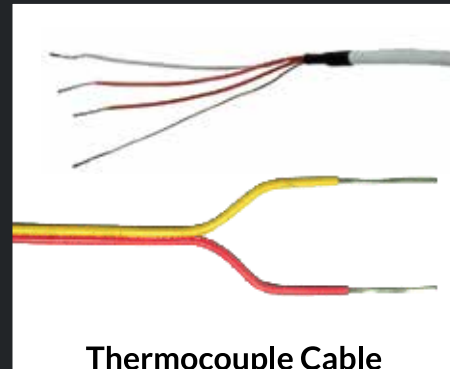
Float Probes



CNC Machining Services



Thermocouples



Thermocouple Cable



Thermocouple Connectors



Compression Fittings

D&N Engineering is Australia's largest regional manufacturer of Temperature Sensor requirements, CNC Machining Services, Turning & Milling

A proud partnership



More information can be found at www.fivesgroup.com.

NATIONAL

THE relationship between Tomago Aluminium and the Fives group dates back to 1983.

Fives ECL supplied the first pot room cranes, furnace tending cranes and cast house cranes, while Fives Solios supplied gas and fume treatment centres, a green

anode plant and crushing stations for a combined total of more than 50 major pieces of process equipment.

Since 2001, Fives Services has maintained equipment on behalf of Tomago Aluminium and since 2013, Fives has been a permanent on-site maintenance contractor, ensuring equipment availability.

Fives, an industrial engineering group, designs and supplies machines, process

equipment and production lines for the world's largest industrial groups including the aluminium, cement, minerals steel, glass, automotive, aerospace, logistics and energy sectors.

Located in more than 30 countries with almost 8400 employees, Fives Group is known for its technological expertise and competence in executing international projects.

"Having a permanent site based maintenance team gives us the ability to ensure high equipment availability, reliability and safety on a 24/7, 365 basis which is vital to ensure the continued success of Tomago Aluminium," Fives Services Australia managing director Goran Dahlgren said.

"We look forward to continuing our 35 year partnership with Tomago Aluminium well into the future."



Aluminium

An Extensive expertise in Industrial Process Engineering

- Reduction, Carbon and Casthouse Process Cranes
- Cranes & Materials Handling Equipment
- Gas & Fume Treatment Centres
- Green Anode Plants and Firing & Control Systems
- Cast House Melting & Holding Furnaces
- Engineering Design & Manufacture
- Industrial Maintenance & Site Services

Fives Services Australia
Brisbane - Newcastle
P: 07 3630 6600 - F: 07 3630 6625
www.fivesgroup.com

JV formed to deliver change

NATIONAL

HELLOWORLD Travel Limited and QBT have entered into a joint venture with In Travel Group to form Inspire Travel Management.

The JV marks the first-in-market enterprise forming a majority Indigenous owned travel management company in Australia.

Inspire Travel Management provides the opportunity to demonstrate best practice in the corporate travel sector, while combining real outcomes in the areas of Indigenous employment and procurement.

Inspire Travel Management provides the full range of corporate travel services with proven capability and support of more than 250 travel professionals operating in nine offices across Australia.

Using the latest in travel technology, the company's approach is not to deploy

technology just for the sake of it, but to enhance customer experience by improving speed, quality and convenience.

Its research and development time is not spent simply on improving appearances, but rather practical applications that benefit its clients.

Inspire Travel Management adopt the latest technology and make it simple, transparent and highly personal, so its customers get more of what they need and less of what they don't.

The business is led by Indigenous travel professional Dwayne Good, and aims to support and grow the Indigenous business sector by contributing to improved employment and economic outcomes, particularly in the travel industry.

More information can be found at www.inspiretm.com.au or by contacting Inspire Travel Management managing director Dwayne Good at dwayne.good@inspiretm.com.au or 0434 986 891.



Inspire Travel Management managing director Dwayne Good, and Helloworld Travel Limited chief executive Andrew Burnes.

Hagstrom experienced in all terrains

NATIONAL

FOR more than 25 years, Hagstrom Drilling has been drilling the most challenging terrain nature can provide, delivering exploration, construction and civil programs on land and over water.

Founded in WA, the company has successfully expanded on the quality results and the services it provides, and now also operates a permanent facility in Sydney, NSW and is delivering drilling projects nationally.

The diversity of geographical locations and project requirements certainly is a challenge, from drilling coal feasibility studies in western NSW, to providing exploration and VWP installations in WA.

Hagstrom has recently completed some technically challenging drilling projects providing deep and angled holes for the installation of VWP, Extensometers and Inclometers at some of WA's well known mines.

The combination of drilling experience and expertise while maintaining the highest HSE standards ensured an accurate and reliable completion of these challenging projects.

In NSW, Hagstrom has been providing geotechnical investigation drilling services to some of Sydney's iconic infrastructure projects including the Westconnex, Northconnex and the F6 extension to connect the growing populations of Sydney.

Supplying multiple jack up barges and drill rigs to conduct overwater drilling activities in Sydney and Middle Harbour for a recent, large scale geotechnical investigation saw Hagstrom drilling in

Australia's busiest waterway, bringing unique challenges which required the team to adhere to stringent operating restrictions and still meet project deadlines.

With investigations completed, the project was successfully and safely completed on time, budget and with zero injuries.

Hagstrom Drilling has also just successfully completed a four month overwater geotechnical drilling investigation as part of Melbourne's West Gate tunnel project.

Hagstrom is proud of its drilling personnel and their ability to achieve results where others fail.

Not only is it the skills of its workforce, but the investment by management to consistently achieve high results and succeed whatever the challenge.

Hagstrom has invested in Sonic, Aircore, RAB, Mud Rotary, Diamond, CPT and overburden drilling systems to meet the increasing demands of clients.

The company is also the only drilling contractor in Australia that owns and operates drill rigs, CPT equipment and jack up barges.

This unique combination of assets eliminates the requirement for multiple contracts, duplication and review of HSE Management information, providing a cost saving on any project.

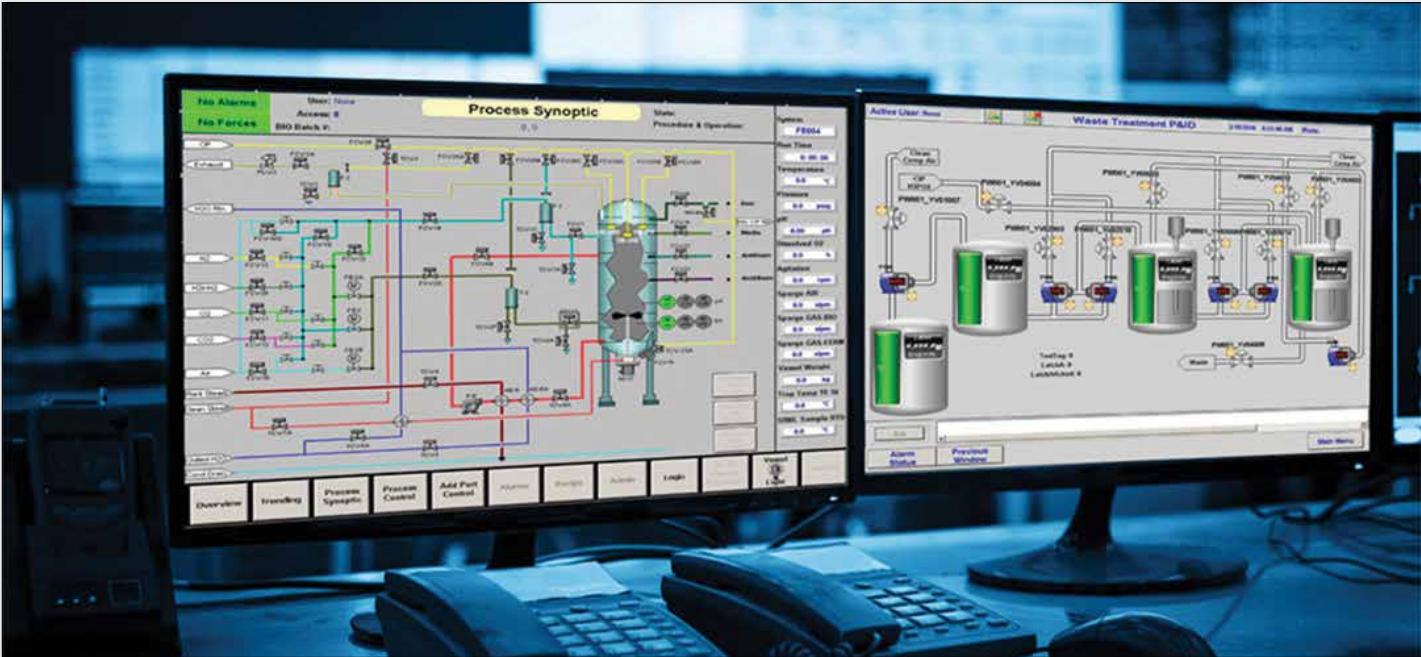
Poor methodology and techniques can be costly and time consuming, so by engaging Hagstrom Drilling, clients can be assured they will receive more than 25 years of industry experience.

Hagstrom maintains a track record of delivering, while remaining true to its "Quality Service Safely" motto.



The Hagstrom Drilling team have the experience and skills to complete the toughest of drilling jobs.

Powered by quality control



Megatronic's control systems provide a range of technical capabilities.

WA

MEGATRONIC Power Systems is a control systems and electrical engineering company based in Perth, WA, specialising in electrical and control systems design, commissioning, and maintenance.

The company was set up in 2013 to provide a trustworthy and efficient service with quality as its key objective.

Its team has demonstrated experience and expertise in engineering, design and project management of small to large projects; from concept and feasibility to completion.

From technical design and implementation, to operator interface, every detail receives specialist engineering precision that both its customers and the company can be proud of.

From an operation and maintenance perspective, Megatronic takes a proactive approach to identifying all risk to operations and advises on appropriate preventative action.

Its team of electrical and control system engineers have a vast range of experience in industries including mining, water treatment, power generation, manufacturing and process plants.

Megatronic is an ISO:9001:2008 certified company and its staff are proud of the quality management system which is the heart of the company's operations.

Through functional project planning, control of records and administration, combined with Megatronic's specialist technical abilities, projects are delivered on time and on budget, to a standard clients can trust.

It is the standout company when it comes to electrical and control system design and strives to stay at the top through its continual improvement policy.

Aussie exports test gear

NATIONAL

AUSTRALIAN Pump Industries has announced a major contract for the supply of 500 bar hydrostatic test gear for the Middle East.

Conceived, designed and built at Australian Pump Industry's 2.5 acre Sydney manufacturing base and headquarters, the big machines were chosen against stiff competition from both United States and European manufacturers.

The base product, called the Raptor 18 D/ HPT, offers users the capability of testing oil or water pipe lines up to 500 bar (7,300 psi).

The machines come with double gauge, double valve assemblies that enable the operator to easily read pressure losses in a wide range of applications.

These include pipelines as well as important oil industry equipment that includes valves, compressors, pressure tanks and pumps.

The heart of the system is a "Big Bertie" Bertolini 500 bar Triplex pump that develops 18 litres per minute flow.

The pump has a 316 stainless steel pump



The first shipment of the order "prepped" for delivery. Note the front mounted throttle control and easy access to gauges and valves.

head and features stainless steel valves and solid ceramic pistons with a big capacity finned crankcase that ensures cool running even in the high temperatures of the Middle East.

The drive is from a 2-cylinder Kohler air cooled diesel engine driven through a 2:1 reduction box ensuring a totally dust free drive line.

The engine developing 26hp at 3000 rpm, provides loads of power for the 'Bertie' pump.

The whole machine is encapsulated in a heavy duty stainless steel frame mounted on four big steel wheels with pneumatic tyres.

The machines are highly portable and the frames include an integrated lifting bar that enables units to be easily moved around on mine sites.

Australian Pump is Australia's leading manufacturer and designer of electric motor and engine drive hydrotest equipment.

The company offers a comprehensive range that is widely used in government, construction, pipeline management and the rental industry.

Further information including a full product line profile is available from Australian Pump Industries at www.aussiepumps.com.au or by contacting Aussie Pump Industry's High Pressure Equipment Division on 02 8865 3500.



Certified ANSI IEEE 515.1 Products



COST EFFECTIVE BUILT TO LAST QUALITY ASSURED

Heatech Systems Pty Ltd is the leading vendor specialist supplier of world-class Themon heat tracing systems to the South Australian and Northern Territory's oil, gas and mining industries for more than 30 years.

Our clients are provided with fully qualified consultation, design, installation, site supervision and training for all our products.

(08) 8235 9059
sales@heatechsystems.com.au

www.heatechsystems.com.au



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

Safety assured with Group lock boxes

NATIONAL

LOCKOUT equipment physically locks machinery in a safe mode, ensuring energy cannot be restored while someone is still working on the plant.

Tagout is the labelling used during the lockout process.

If more than one person is working on the same plant, each person should attach their

own lock to the isolation device to prevent the isolator being opened before all locks have been removed.

A group lock box is often used to avoid the need for multiple locks on each lockout point; it can also reduce the amount of locks required on a job; and can eliminate the need for multiple lockout hasps and provide an overview of who is still working on the plant.

Under this system, each lockout point

is locked by one lock only (supervisor lock), and these keys are placed inside a group lock box.

Each worker places their personal lock on the outside of the box, securely locking the isolation keys away.

As each worker's task is completed, he or she removes their personal lock, and when all locks have been removed, an authorised site supervisor verifies all workers are out of danger before reactivating power supplies

or equipment.

Cirlock stocks options from 16 to 84 padlock holes, in varying designs to cater to the needs of the job.

Larger group lock boxes also include storage hooks for padlocks and instruction holders can be fitted to some models.

Gearing up its range in 2018, Cirlock will be offering additional colours of the GLB-4 by popular demand.

Proudly supporting mining

NATIONAL

PROGRAMMED Skilled Workforce (PSW) has provided skilled, and safety focused workforces to the mining industry for more than 50 years.

The company was also the first service provider in the industry to be AS/NZS 4801 certified.

Its reputation as the premier employer across mining and resources nationally helps it attract the highest calibre workforce.

In addition, it's rigorous assessment and screening processes make sure that the team select only the best available talent for their customers.

Programmed currently manages thousands of people, including trainees and apprentices, across major mining sites in Australia, working in disciplines such as: operational, trades, professional/technical, administrative and stores personnel.

"We are proud to support the mining industry in Australia through providing safe workers and also nurturing the workforce of the future through our apprenticeship and traineeship programs," Programmed national coal manager Craig Allen said.



More information about Programmed can be found at: www.programmed.com.au.

With branch locations close to key mining sites across the country, Programmed staff are nearby to support employees and customers, and maintain a

regular onsite presence.

"Our team understands the needs of the mining industry and have the expertise required to help support our customers,

from industrial relations advice through to increasing participation of Aboriginal and Torres Strait Islander people," Mr Allen said.

A global footprint

NATIONAL

ASTEC is a global manufacturer of equipment for the mining, aggregate, infrastructure and energy industries.

Initially founded in 1972, the company has over time incorporated businesses with more than 100 years of manufacturing history.

Today, Astec manufactures more than 220 products and its goal is to design, manufacture and provide the most innovative and reliable equipment for the industries it serves, coupled with unparalleled customer service, training, education and support.

Astec's drive for innovation has produced a stream of new patents, meaning that Astec Industries businesses have become leaders in their respective markets, giving customers the means to be more productive and profitable.

As a global manufacturer, Astec has a broad footprint with operations in North and South America, Europe, South Africa and Australia.

In the Australasian region, Astec is ably represented by Astec Australia which is responsible for direct sales and support of Astec products from its offices in Brisbane, Melbourne and Perth.

For the Australian mining sector, Astec offers a range of solutions, including crushing and screening equipment, apron and vibrating feeders, mobile stacking and bulk reception conveyors and fixed Rockbreaker boom systems.

This equipment provides solutions for equipment replacement or new greenfield projects.

All equipment solutions, while offering the latest of innovations, come with years of deep use and global reference sites with full engineering and application support.

Astec also offers the underground mining market a range of innovative service and support vehicles, including mobile and trailer mounted Rockbreaker



Astec businesses provide a large range of equipment solutions to the mining industry.

Boom systems, mobile scaling, blast hole charging vehicles and the recently launched Minerunner multi-role underground light vehicle (LV).

For underground mining operators seeking a replacement for easily worn-out and overloaded light vehicles, Astec has recently launched the Minerunner Underground all-purpose LV.

This vehicle is purpose-built for work underground, has increased payload, superior manoeuvrability, and reduced maintenance costs over traditional road going 4WD vehicles in underground mining applications.

Materials handling and processing

A recent acquisition into the Astec family of equipment has been the Telestack range of mobile stacking, reclaim and shiploading conveyors.

Telestack are also very well known for their mobile hopper feeding and truck unloading stacker conveyors.

The Telestack range is marketed as Astec Bulk Handling solutions and joins in with the existing Astec material handling equipment range.

For projects requiring superior feeding

and material control, Astec Apron Feeders balance ease of use and maintenance against brutal hard-wearing performance needs.

Astec has continued to refine the design of its Apron feeders over more than 40 years of operation.

Astec business Astec-BTI also currently supplies a full range of Rockbreaker Boom Systems, from the world's largest boom system to systems designed for working in underground mining applications.

The boom system range is complemented with state of the art Teleremote, perimeter restriction and automated movement functionality.



Quality assured mining transfers



GRT Minesite Transfers is committed to the safe, reliable, on time delivery of passengers travelling to and from remote sites across WA.

WA

AFTER more than 40 years in the driver's seat, Goldrush Tours subsidiary GRT Minesite Transfers is widely regarded as an industry leader in mine site transfers.

Headquartered in West Kalgoorlie with a satellite depot in Leinster and divisional offices in Tom Price, Paraburdoo and Pannawonica, the company conducts more than 4500 people movements daily to and

from mine sites peppered across regional WA.

The company currently employs more than 120 casual and fulltime workers with fitness for work and safety management systems in place that exceed industry standards.

"We only employ experienced coach drivers who pass our pre-employment driving test, drug and alcohol check, police clearance and license endorsement checks,

and fitness for work medical," GRT Minesite Transfers managing director Guy Brownlee said.

"Fatigue management training is also part of an extensive ongoing driver training program that includes daily fitness for work checks, periodical driving assessments and regular medical check-ups."

It is this rigorous employment standard and attention-to-detail that has earned GRT Minesite Transfers preferred supplier status

with corporate and mining industry giants such as BHP, Rio Tinto, Gold Fields Ltd and Sodexo.

Goldrush Tours' bus and coach charter division also specialises in event mobilisation and logistics management, moving upwards of 2000 people a day during major regional conferences and events throughout the year.

More information on how to get mining workers to and from site, safely and reliably, can be found at www.goldrushtours.com.au.

Transporting the Mining Industry's **Most Valuable** Asset for **Over 40 Years**

GOLDRUSH TOURS

GRT Minesite Transfers



Call us now!

08 9092 6000

www.goldrushtours.com.au

OHS Certified and Quality Assured, GRT Minesite Transfers transports more than 4500 shift workers to and from mine sites across WA every day, 24/7.

Get your people to and from work on time every time, rested and safe.

info@goldrushtours.com.au | 19 Epis Street, Kalgoorlie

Built tough and safe for mining

WA

ABLE Bus and Coach design and build robust, safe and practical 2WD and 4WD coaches to suit harsh and hazardous conditions.

For businesses looking to mobilise a mining workforce, ABLE is one of Australia’s most experienced manufacturers of purpose-built coaches.

It offers a variety of mine site coaches with a seating capacity of between 10 and 50 people.

All ABLE coaches are custom-built and meet or exceed Australian Standards and Australian Design Rules.

Since 1998, ABLE’s business philosophy has always been to build tough, yet safe, reliable and comfortable vehicles that meet the highest standards set by a customer base that includes BHP, Rio Tinto and Byrnecut, giving it a repeat business rate of more than 90 per cent.

Features such as exceptional ground clearance, ease of maintenance and access, practical comfort and safety are all designed in from the outset.

These include a built-in Roll Over Protection Structure (ROPS) to Australian Standards 1636.1 and 2294.2 and Australian Design Rule rollover compliance, full size coach seats with



ABLE is a premier supplier of mine-spec buses and coaches.

seat belts on all seats, driver’s air bag, speed limiter and lockable battery isolator switch.

All stages of production undergo

rigorous inspection to meet high standards of quality control and all engineering tests are validated.

To date, ABLE has developed and built

over 400 buses and coaches for clients Australia-wide.

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

10 SEAT ABLE CRUISER

NOTHING BEATS **ABLE** QUALITY AND SAFETY STANDARDS

✓ ROPs Compliant

✓ Meets ADR59 Rollover Strength

✓ 100kph Lane Change Tested

✓ Forward Facing Seat Belt Coach Seats

✓ Electronic Stability Control

✓ Module easily transferable onto new chassis

Kevin De Bruin

+61 418 984 544 | +61 8 9371 7100

kevin@ablebusandcoach.com.au

ablebusandcoach.com.au

Specialised vehicles for every job!



Whether you're looking for a bus to take the crew to site or a truck to get you out of trouble, Fleetspec Hire has it on hand. We specialise in providing current model trucks and buses which are mine site ready, complete with all the extras to get you on site quick smart. We can keep your team running reliably and on time, just like our fleet.

Call us today on **9244 4748**, and let's get things moving.

**EVERY TRUCK AND BUS
YOU'LL EVER NEED**

Fleetspec Hire

TRUCK & BUS

Visit **fleetspechire.com.au** or email us at enquire@fleetspechire.com.au

THE AUSTRALIAN
MINING REVIEW

FEATURES FOR MAY 2018

Aeris Resources
Arafura Resources
Atlas Iron
AuStar Gold
Centennial Coal
Doray Minerals
Empire Resources
Heron Resources
Independence Group
MACA
Mining in the Bowen Basin
MMG Dugald River
Monument Mining
Native Title
Newmont's Boddington Mine
Oz Minerals
St Barbara Resources
Westgold Resources

CALL US TO BOOK YOUR PLACEMENT TODAY

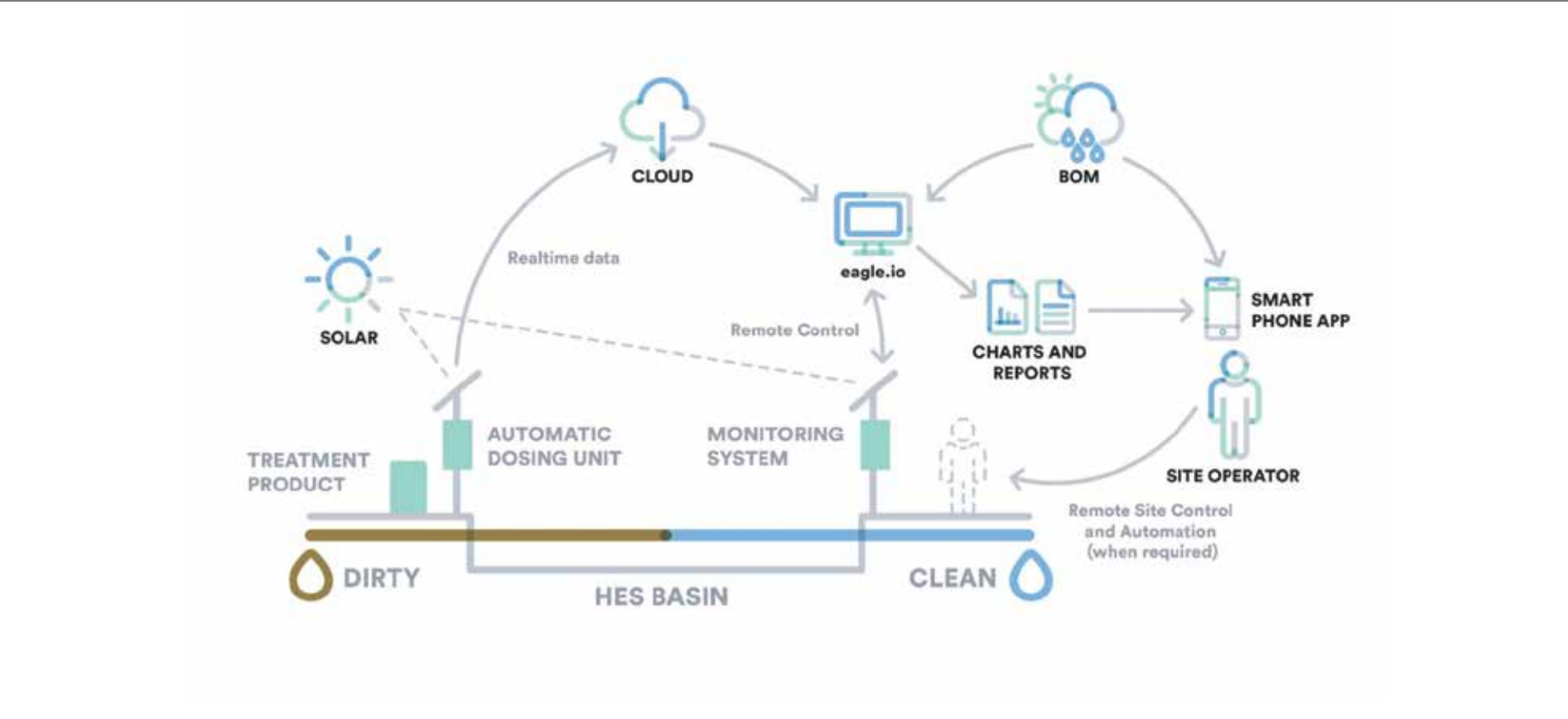
BOOKING DEADLINE: **April 20th 2018**

BRAD FRANCIS

☎ (08) 6314 0303 📞 0405 345 312

✉ brad@miningoilgas.com.au

Hassle free water treatment solutions



Turbid offer complete, innovative water management solutions to the mining industry.

NATIONAL

TURBID water solutions provide hassle-free compliance for mining and construction sites through innovative solutions that manage water and protect waterways.

Turbid can design, build and operate

(or any combination of) innovative 'fit for purpose' water treatment solutions for a site's de-watering and surface water management requirements.

Turbid's end-to-end process takes into account the site's variability in rainfall and soil landscapes, use of stored water as a resource, site specific constraints and

assets, and operational capacity to achieve water quality targets.

Its team of innovative engineers and scientists can help easily and efficiently achieve the site's water quality discharge criteria, and provide the satisfaction of knowing that a project's activities are not harming waterways.

That's why Turbid offers the complete solution with innovative designs, treatment and monitoring processes to ensure only clean water is leaving site without hassle or restraints to a project's operation.

More information on Turbid's water management systems can be found at: www.turbid.com.au.

DIRTY WATER?

Our team of environmental scientists and engineers provide innovative designs, treatment and monitoring solutions to ensure only clean water leaves your site, without hassle or restraints to your operations.

WE PROVIDE

- **On-site testing and treatment service** – allows for authorised discharge of water from your site, usually within hours.
- **Water monitoring and reporting** – both manual and automated water quality monitoring.
- **Treatment products** – fast acting, environmentally friendly coagulants and flocculants to treat water.
- **Training** – on-site training of personnel to effectively and rapidly treat dirty water.
- **Automated water treatment** – Turbid's High Efficiency Sediment (HES) basins deliver automated water treatment, reduced labour requirements and easily achieved compliance.



A market leader in flocculation

NATIONAL

SNF FLOERGER started from humble beginnings, manufacturing polyacrylamides in 1968 out of a refurbished horse stable in Saint Etienne, France.

By the early 1980s, a continuous expansion program led to the construction of production lines at the rate of one per year and saw SNF build the largest polyacrylamide plant in the world.

In 2000, SNF created 30 subsidiaries around the world in order to provide highly skilled, on-site technical support.

SNF provides speciality chemicals for the mining industry worldwide.

Its products deliver reduced operational and energy costs, along with reduced water consumption and environmental impacts.

SNF manufacture polyacrylates and polyacrylamides used as either dispersants or flocculants.

Specially designed flocculants (DRYFLOC) enable higher thickened slurry underflows leading to increased plant throughput and recoveries.

SNF also manufacture hydroxamated flocculants for the alumina industry and have two modern plants in China which produce Xanthate based collectors for the flotation market.



SNF's dynamic rig simulating flocculant response in a thickener feed well.

As part of its innovation strategy, SNF dedicates 2 per cent of its annual turnover to R&D.

The company also collaborates with customer research laboratories and prominent universities worldwide.

SNF's business is solely focussed on customer needs, and this drives its innovation of new products to further advance mining processes.

SNF's vision is to be the world's pre-eminent producer of water-soluble

polymers.

Its success story continues today, having established itself as a global leader in polyacrylamide manufacture with a capacity of 1 million tonnes per year.



SNF (Australia) Pty Ltd is a subsidiary of the privately owned chemical company SNF Floerger (headquartered in Andrezieux, France and Founded in 1978), the largest manufacturer of polyacrylamide flocculants in the world. This gives SNF the unrivalled opportunity for operating flexibility and reinvestment to meet global market demands.

SNF'S STRENGTHS LIE IN THE FOLLOWING AREAS:

- Unrivalled production capacity and security of supply (circa 45% of all global polyacrylamide at 1000KT across 23 facilities- more than three times that of the next largest manufacturer)
- Strong company growth and investment in people & production
- ISO9001 certified products
- Competitive pricing
- Substantial product stockholding within Australia
- Market leading technical service and support



CONTACT

SNF (AUSTRALIA) PTY LTD

PO Box 189 Corio, Victoria, Australia, 3214

+61 1300 763 287

+61 3 5275 8506

snf@snf.com.au

www.snf.com.au

Get more out of your ore



More information can be found at: www.kemira.com.

MINERAL processing is an energy–and water–intensive process.

We understand your needs for increased recovery of copper, gold or iron and help with chemistry for water conservation and process optimization.

Our approach covers the full mine-to-mineral or metal processing and tailings management, and we can

tailor a solution to help you improve your production yield and reduce your overall costs.

With Kemira, you get access to extensive applications experience in thickening, filtration and clarification – and nearly 100 years of experience in water treatment from different applications around the world.

World-class R&D solving customer challenges

In polymer technology, we have the best industry experts working in three R&D hubs globally, dedicated to solving customer process challenges.

With our own laboratories, we're able to work together with you to troubleshoot

and guide you with your options.

We also use direct feedback from the field tests and trials – every field is different. Best solutions are found together, in close collaboration.

Get in touch with us today to discuss your mineral processing challenges!

Drop us a line at water@kemira.com or call (03) 9702 3422.



ADDING TO YOUR EVERYDAY

Adding to process efficiency in metals recovery

With extensive experience from a broad spectrum of applications around the globe, we have the best industry experts dedicated to solving customer process challenges.

KEMIRA.COM

kemira

BCM system conveys big benefits

NATIONAL

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

This latest solution combines the features of the traditional CONTI®RipProtect and CONTI®CordProtect into one multifunctional system for increased features and connectivity.

With more than 100 units already installed worldwide, the Conti®MultiProtect 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.

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 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.

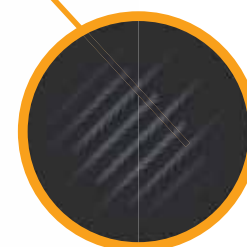
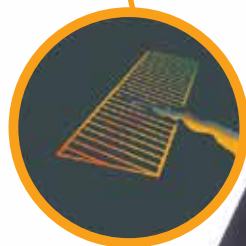
ContiTech Australia regional manager Ben Wood said there is a fair amount of flexibility in terms of system functionality.

“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.

Continental
The Future in Motion

Patented rip inserts allow rip detection in non-troughed and troughed areas.

Flat sensor array monitors cord damage and deviations in splices



Troughed sensor arrays identify rips immediately after critical load points.

Detect and prevent costly conveyor belt damage.

Our CONTI® MultiProtect belt condition monitoring system, ensures your conveyors deliver optimum availability and up time, through early detection of cord damages, splice failures and costly belt rips. Upon detection of any of these issues it can send an alarm to your nominated device. It even stops the belt automatically if necessary.

- Prevent costly damage • Prevent downtime incidents • Increase belt lifetime
- Increase up-time, system availability and reliability • Flexible operation according to your requirements

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



Monitoring is visible on demand from any nominated desktop, laptop or through alerts issued to site operational systems, email or SMS.

Fast, accurate tri-axial data collection



The ergonomic design ensures fatigue-free work and is suitable for both right and left-handers.

NATIONAL

PDS Condition Monitoring Services has supplied products and services to the sugar, mineral, refining, mining, paper and power generation industries across Australia for more than 15 years.

Its qualified registered engineers and Level IV certified vibration analyst and condition monitoring technicians have extensive experience in performing a range of services, including API certified tank and pressure

vessel inspections.

The team is also dedicated in the sales and support of Prüftechnik Alignment and Condition monitoring products in Australia, including the newly launched VIBSCANNER 2 model.

VIBSCANNER 2 is a high-speed data collector that has been cleverly designed to increase the efficiency of vibration-based condition monitoring of machines and plants.

Thanks to its forward-looking measuring principle and parallel acquisition of

measurement data, the VIBSCANNER 2 vibration measurement device collects all relevant machine condition data at the push of a button: measuring times are up to four times shorter.

When a machine's RFID tag is scanned with the integrated RFID reader, the device displays the next measurement location (e.g. SAP function location) along with the position and measurement direction and ensures that no measurement location is overlooked or incorrectly processed.

The automated RPM detection for variable

speeds is also a key feature of this device.

The device measures overall values, spectra and time signals synchronously in three axes. Also the handling of the device has been designed in such a way that even new or untrained personnel can effectively perform reliable error-free measurements, especially using the RFID tag option.

More information on PDS Condition Monitoring Services and the VIBSCANNER 2 can be found by requesting information via info@pdscms.com.au or calling (07) 4725 6117.

db PRÜFTECHNIK

Introducing VIBSCANNER® 2

High-speed synchronous triaxial data collector sets new standards

- **Fast** – Measurement up to 4 times shorter than industry standard
- **Intelligent** – Innovative RPM determination, triaxial sensor records vibration signals in three axes simultaneously
- **Durable** – Shock proof, dust and water jet proof, glove compatible
- **Long-lasting** – 10-hour battery life
- **Easy** – Intuitive operation thanks to the graphical user interface
- **All in one** – Comprehensive data collection at one push of a button

☎ 07 4725 6117 ✉ info@pdscms.com.au
🌐 pdscms.com.au



Couplings and more!

KTR manufacture a range of flexible couplings for power transmission including shaft-to-shaft, shaft-to-flange, and C.I. flywheel applications. KTR also manufacture ranges of oil/air blast coolers, bespoke multi-media coolers, industrial brakes of the hydraulic and electro-mechanical variety, as well as steel and aluminium tanks and other hydraulic accessories associated with power pack construction.

DEANQUIP
POWERTRANS & HYDRAULICS

BoWex®
FLE-PA



OAC



www.deanquip.com

THE AUSTRALIAN
MINING REVIEW

PROFILES FOR MAY 2018

2-Way Radio
Automation
Electrical Switchboards
Fatigue Management
Floating Pump Pontoons
Forensic Investigation
Foundries and Castings
Getaways and Escapes:
 Broome in Focus
 Snow Escapes
Health & Fitness
Industrial Cameras
Industrial Recycling Solutions
Industrial Sheds & Shelters
Industrial X-Ray and Non-Destructive Testing
Line Boring Services
Materials Handling
Mining Consultants
Office & Business Furniture
Private & Boarding Schools

CALL US TO BOOK YOUR PLACEMENT TODAY

BOOKING DEADLINE: April 20th 2018

BRAD FRANCIS

☎ (08) 6314 0303 📞 0405 345 312

✉ brad@miningoilgas.com.au

TED ups safety, reduces costs

NATIONAL

STARTED as a small family business with the launch of its Tracked Elevated Device (TED) in 2011, Nivek Industries has fast become synonymous with quality and safety in many mines across the country and to a growing extent, the world.

The benefits of having a remote controlled, all terrain belly plate jack able to carry out emergency maintenance safely in the field are massive.

Q. What do you think of TED in the pit?

It's worth its weight in gold safety-wise, and you get the job done quicker.

You're not in the line of fire, you're out of the way. It works well.

To pull belly guards off in the pit you need another truck and hook up slings around the belly guard to try and drop it down.

This has the potential of a belly guard falling off the slings and hurting someone. You've got a person in the line of fire.

You can't put money on safety, using TED, the downtime was easily halved; the team got the job done pretty quickly.

Q. What do you see as the main safety benefit?

Not having to climb under the machine to get rid of belly guards. Not having to be under the machine when you're lowering.

We've had fatalities in our industry from dropped belly guards, so being able to lower the belly guards without the operator being anywhere near the machine is fantastic. It's the number one safety priority for us.

The manual handling benefits are enormous; TED being able to do all the grunt work for you rather than the guys having to actually manually lift 40, 50, 60kgs into place. Even dropping it out of place, it's a really good benefit from the machine.

Q. If TED potentially goes into the pit to save floating the dozer back up to the pit, what would the saving be?

The downtime is in the hours, potentially a whole shift. With TED in the pit you could get a hose repair done in two hours; whereas previously, it would take a full shift to get that repair done.

It generally does take a full shift to get that repair done, depending on the hose, however TED has significantly reduced the amount of time required for in-pit repairs.

It's out in the field where TED really comes into its own.



Nivek's Tracked Elevated Device.



- Remote Controlled
- Mobile
- Hydraulic Power
- All Terrain

TED - making field repairs safer and easier

Being all-terrain, TED can facilitate repairs in the field, saving a fortune in float costs and downtime.

TED's skid steer tracks, low profile, and front blade attachment allow TED access just about anywhere, and the ability to create an even pad on which to carry out emergency repairs safely and efficiently.

Effortless, remote controlled operation keeps fitters out of the danger zone during the critical lift and lowering stages of belly plate removal.

With our versatile range of attachments, TED can now help with the maintenance and replacement of belly plates, steer cylinders, tie rods, Y-links, cutting edges and plenty more.



f TrackedElevatingDevice
globe www.nivekindustries.com.au
envelope admin@nivekindustries.com.au
phone (02) 6571 3703 **phone** 0418 517 359

"It's out in the field where TED really comes into it's own."
Dan – Maintenance Superintendant.

KEYS TO EXPLORATION SUCCESS

Being an exploration company has many hurdles, but the payoffs can be huge with a highly motivated and experienced team at the helm. This, according to Cervantes Corporation managing director Marcus Flis, is the philosophy behind his company's interest in the historic Payne's Find gold field.



An old headframe in the Payne's Find gold field.

CAMERON DRUMMOND

Q. What is your professional history?

The big end of town was my training ground. Multi-commodity exploration with CRA Exploration. Membership of "task forces" was a highlight of that experience. Later, work with Newmont Australia gave me very specific experience in various styles of gold deposits.

I was called back by Rio Tinto to head up a task force in the Hamersley Basin, following which I was appointed Global Director, New Business for Rio Tinto Iron Ore. That position gave me insight and understanding of how good deals are done and what drives a successful business.

I took those lessons into Royal Resources as managing director, where we gained control of arguably Australia's largest magnetite resource.

I have degrees in geosciences, am a Fellow of the AusIMM, and have been awarded *Best Emergent Company* (Diggers and Dealers) and *Explorer of the Year* (Australian Mining).

Q. Why are you re-visiting the historic Payne's Find gold field?

The Paynes Gold Field is a historically and geologically fascinating field. It was dominated by small mines extracting high grade gold – up to 150g/t. Since its discovery it has been locked up by prospectors, so little modern exploration had been applied to it.

That changed when Paynes Find Gold

(PFG) acquired it in 2010. Unfortunately, rather than pursuing a "big picture" target, they got bogged down in drilling the small, late stage quartz-vein gold that characterises the old mine areas.

Perhaps predictably, they intersected high grade gold, but no real tonnage that could form an economic resource.

Towards the end of their tenure, PFG brought in consultants to reinterpret the geology of the area. With a last hurrah, they tested that reinterpretation, did not get encouraging results, and withdrew.

PFG tested only about 500m of the mineralising Primrose Shear. That shear extends for more than 8km on Cervantes' ground. It traverses an area that is undercover, has no historic hard rock workings, yet sustained alluvial gold mining.

There is a lot of gold in this field waiting for someone to unlock its secrets, and we believe we now have the tools to do that. Given the focus, Cervantes calls this area the Primrose project.

Q. What are the foreseeable advantages of the project?

First and foremost is the observation that gold occurs as high grade. The old miners worked narrow-vein gold. Where the shear is intersected and shows ancillary features like alteration, the grades are still good, but the mineralised widths are much more attractive.

There is also now a good database to untangle the structure/alteration complexity. The old adage that 'it's not often the first explorer that wins the prize' may very likely be the case here. Understanding grows with new information; Cervantes has a real chance for discovery – there remains a lot of highly prospective, untested ground.

Importantly, the project is close to infrastructure, is free of Native Title, and is located in one of the world's lowest sovereign risk jurisdictions.

Cervantes means to see a mining operation here. For an emerging company, this field offers the opportunity to bring in short term cash flow while pursuing the ultimate prize of a large tonnage, good gold grade resource.

Q. Tell me about Cervantes' 2018 exploration campaign, and what you wish to achieve this year.

Cervantes has three exploration areas, of which the Primrose Project is the flagship prospect. A regional sampling of the Primrose Shear by aircore drilling is targeting four areas that show surface gold anomalism over kinks in the Primrose Shear. Additionally, the historic Pansy gold mineralisation will be drill tested with the view to proving up a JORC resource for near-term development.

A programme of infill drilling will be undertaken at Albury Heath to both expand that 390,000t at 2.15g/t gold Inferred Resource and possibly convert it to a higher category for discussions with local mills.

Finally, a surface geochemistry survey has started on Cervantes' Abbott prospect north-west of Meekatharra. This covers the northerly extension of a gold hosting structure currently being drilled out by Thundelarra.

Q. What makes a good exploration company, and what hurdles does one need to factor in working in today's mining climate?

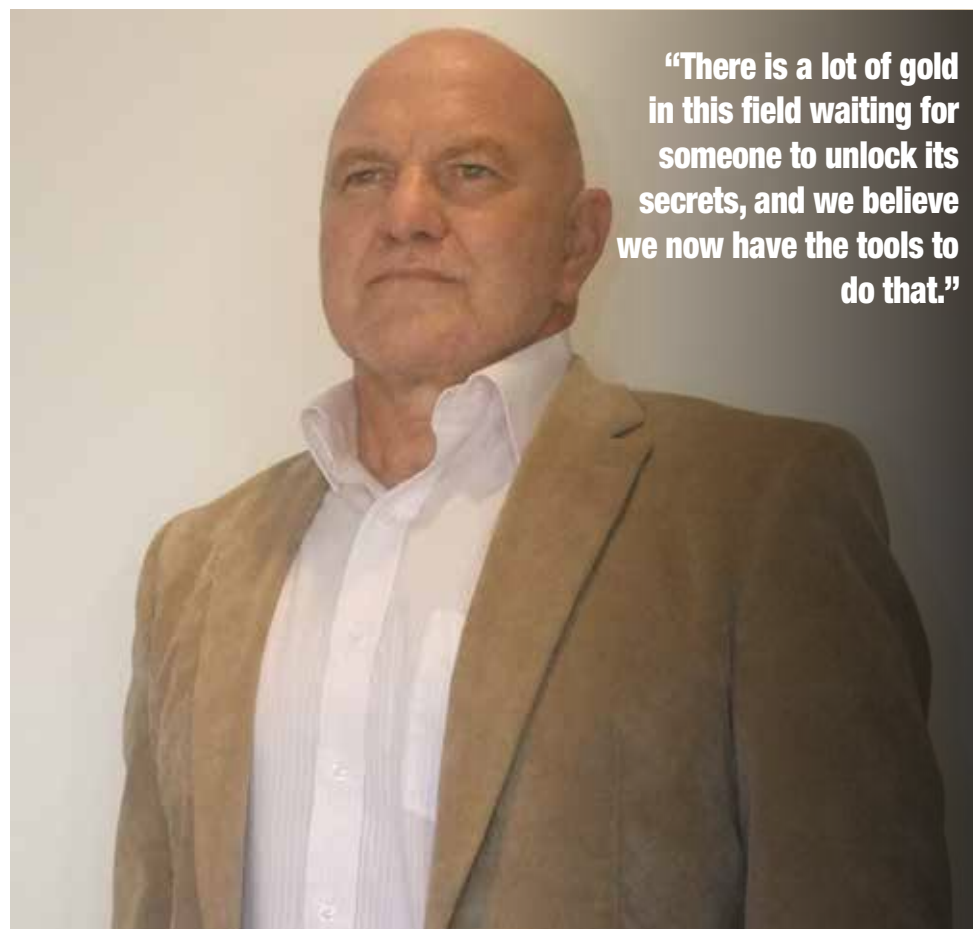
Persistence, with technical excellence and agility. We have put together a team that will deliver that excellence and have the flexibility to steer our efforts to success.

The major hurdle that explorationists face is red tape. Unnecessary and unproductive compliance costs are increasing and squeezing out new entrants from the industry.

Cervantes backs the call by the Minerals Council of Australia for a review of the Native Titles Act. But reform must go much further. Assessment and overview of proposed activities must be streamlined. The WA Government has gone some way down this path; Cervantes encourages them to continue.

Q. What is the best piece of advice you have been given in your career?

Love what you do, never stop learning about what you do and apply it.



"There is a lot of gold in this field waiting for someone to unlock its secrets, and we believe we now have the tools to do that."

Cervantes managing director Marcus Flis.



MINING TRAILER PRODUCTION BUSINESS FOR SALE

Rare Opportunity

Engineering company, Bosich (Est 1950), is known within the mining industry for the manufacture and maintenance of large, quality mine site low-loader floats and trailers. An opportunity is now available for expressions of interest, with this business and associated manufacture site available for new ownership.

Terms of sale are negotiable, and business and property can be split for separate purchase. For further information, please direct enquiries to Milan Bosich - milan@bosich.com.au



**3,000m² Factory incl.
Office, Machine &
Engineering
Workshop**

**Australian & US
Patents**

**Overseas
Manufacturing
Associates:
Indonesia (25yrs)
China (16yrs)**

**Manufacture, Spare
Parts and Onsite
Servicing**

**CEO to assist during
transition**

BOSICH

Forrestdale, WA, Australia
+61 8 9497 9443

www.bosich.com.au

Expressions of interest:
milan@bosich.com.au

DIESEL PARTICULATE MEASUREMENT



dPM-RT REAL-TIME DIESEL PARTICULATE ANALYSER

The dPM-RT is the tool that mechanical and workshop staff need in order to reliably identify high DPM emitters, and to validate the effectiveness of emissions-related maintenance.

- Real-time measurement of fine particulate levels in diesel exhaust
- Easy to use, on-screen prompts, minimal (<10min) training required
- Designed to handle the rugged demands of mining sites
- Auto-generates & displays Stall or Free Acceleration test results

The World Health Organisation has declared the black carbon particles emitted by diesel engines to be a Class 1 carcinogen (the highest risk level). Contributing towards achieving a healthy workplace, Pacific Data Systems Australia now introduces the **dPM-RT Real-time Diesel Particulate Analyser** - a rugged, no-frills tool designed to help minimise worker exposure to these dangerous particles.

Controlled using the **dPM-RT**'s single operating button, a simple, one-minute workshop test can immediately identify high emitters, and verify the effectiveness of emissions-related maintenance. Developed here in Australia, the instrument's internal workings literally do the task of a laboratory, but in a simple shoebox-sized case!



PACIFIC DATA SYSTEMS AUSTRALIA

27 HI-TECH COURT, EIGHT MILE PLAINS, QLD 4113 • +61 7 3361 2000 • www.pacdatasys.com.au

pacific data systems
Australia
Solutions. Technology. Simple.