

# THE AUSTRALIAN MINING REVIEW

PP100007123

Incorporating THE AUSTRALIAN ENERGY REVIEW

A product of  
Publications &  
Exhibitions Australia Pty Ltd

ISSUE 120, DECEMBER 2017

**THE \$800M  
CAIRN  
HILL MEGA  
PROJECT**

NEWS **p6**



**BACK TO  
BLACK**

MINING IN  
THE HUNTER  
VALLEY **p19**



**PETER WRIGHT  
BASS METALS**

THE  
INTERVIEW **p63**



**MAJOR COMMODITIES** SNAPSHOT **p4**



## BALANCE OF POWER

**Preparing to step down after six and a half eventful years at the FMG helm, Nev Power is leaving behind some mighty boots to fill.**

**FEATURE **p23****

Image: FMG.

## SPECIALISTS IN HEAVY DUTY VALVES

SLURRYTUFF™ valves excel in some of the toughest environments imaginable.



Manufactured by Upwey Valve & Engineering Pty Ltd

### EZI-VAC

Air Release/Vacuum Break Valve

- Self-operating
- Rotating float design
- Optional drain/flush point
- Manufactured in Australia
- Suitable for extreme conditions



(03) 9754 7700

[www.upwey.com](http://www.upwey.com)

[info@upwey.com](mailto:info@upwey.com)



## NEWS

1

Commodities Snapshot	4
The Contractors	12
Technology & Innovation	14
International	16
Commodity Focus: Copper	18

## SPECIAL FEATURES

The Hunter Valley	19
Fortescue Metals Group	23
The Upper Spencer Gulf	25
OZ Minerals	31
Rio Tinto Amrun	33
Pacific National	35
Sandfire Resources	37

## INDUSTRY SPOTLIGHT

Companies Gearing Up	38
Conference & Function Venues	40
Corrosion Control	41
Drug & Alcohol Education	44
Haul & Mine Road Management	45
Industrial Tarpaulins	48
METS at the Mine Site	50
Renewable Energy	53
Risk Management	56
Sweeping & Scrubbing	57
Synthetic Ropes	58
Technical Writing	59
Transport & Logistics	60
XRF & XRD Testing	63



"I struggle to see where the supply comes from to balance this demand."

**PETER WRIGHT**  
BASS METALS  
the interview p63

## CU AT THE TOP

### COMMODITY FOCUS: COPPER

news p18

## OUT OF THE ABYSS

### THE UPPER SPENCER GULF

feature p26

## METS

### UNDER THE MICROSCOPE

feature p50

PUBLISHED BY  
ABN 28 112 572 433

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

**GENERAL MANAGER**

Brad Francis  
[brad@miningoilgas.com.au](mailto:brad@miningoilgas.com.au)

**MANAGING EDITOR**

Reuben Adams  
[reuben@miningoilgas.com.au](mailto:reuben@miningoilgas.com.au)

**JOURNALISTS**

Cameron Drummond  
[cam@miningoilgas.com.au](mailto:cam@miningoilgas.com.au)

Elizabeth Fabri  
[elizabeth@miningoilgas.com.au](mailto:elizabeth@miningoilgas.com.au)

**GRAPHIC DESIGNER**

Charlotte Lufino  
[charlotte@miningoilgas.com.au](mailto:charlotte@miningoilgas.com.au)

**SALES EXECUTIVES**

Beej Francis, John Carter,  
Chris Foley, Penny West,  
Andrew Collett

**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](mailto:editorial@miningoilgas.com.au)

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

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

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

**NOTICE TO ADVERTISERS:**

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

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

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

**PENALTIES:**

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

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

## YOUR 12 MONTH HARD COPY SUBSCRIPTION TO THE AUSTRALIAN MINING REVIEW

- ⊕ Original commentary and analysis ⊕ Interviews ⊕ News
- ⊕ In-depth company and project profiles ⊕ Cutting edge technology, products and services

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

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



# MAXIMUM STRENGTH MAXIMUM DURABILITY

West Coast Poly's commitment to excellence in manufacturing produces the highest quality polyethylene tanks suitable for a wide range of mining applications. The tanks versatility and resistance to weathering makes them the ideal choice for potable water, process water and chemical storage in the harsh mining regions of Western Australia.

Our experienced technical staff can assist with configuring a tank to YOUR specifications



Call 1800 555 185

e. [info@westcoastpoly.com.au](mailto:info@westcoastpoly.com.au) | Factory: Canning Vale, Perth

[westcoastpoly.com.au](http://westcoastpoly.com.au)



## 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



**Aussie Pumps**

FREE selection guide  
**02 8865 3500**

AUSTRALIAN PUMP INDUSTRIES PTY LTD  
[info@aussiepumps.com.au](mailto:info@aussiepumps.com.au)  
[www.aussiepumps.com.au](http://www.aussiepumps.com.au)



# MAJOR COMMODITIES

## SNAPSHOT

### WATCHLIST Copper Explorers

#### Minotaur Exploration

ASX: MEP

The explorer has confirmed high-grade copper-gold mineralisation from the first two holes at its Jericho target in north-west Queensland, part of the Eloise joint venture with OZ Minerals, and has committed to further drilling.

#### Alderan Resources

ASX: AL8

Listed on the ASX in June, copper hopeful Alderan Resources' shares have soared from 20c to a high of \$1.95 mid-November amid positive drilling work at the Frisco copper project in Utah.

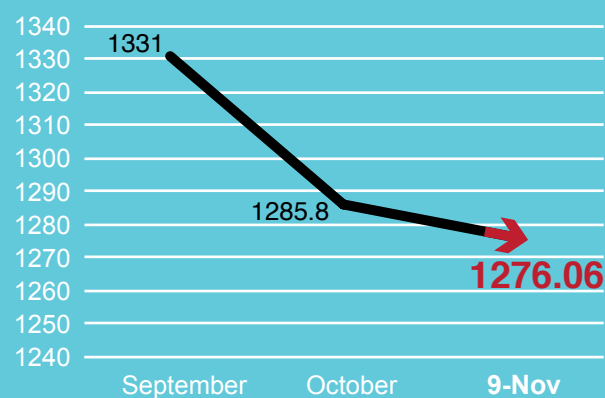
#### Venturex Resources

ASX: VXR

Additional thick high-grade copper intercepts have been confirmed at the explorer's Sulphur Springs project in the WA Pilbara. Six holes have been completed to date with a seventh now in progress.

#### GOLD

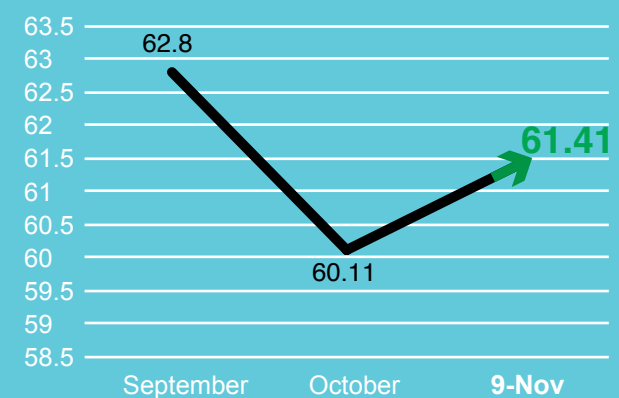
\$US/oz



#### IRON ORE

62% Fe CFR China

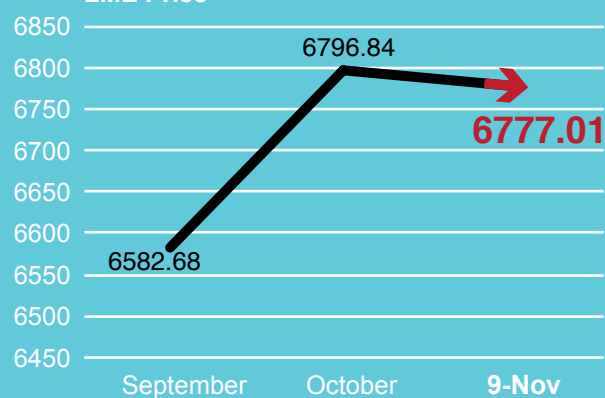
\$US/t



#### COPPER

LME Price

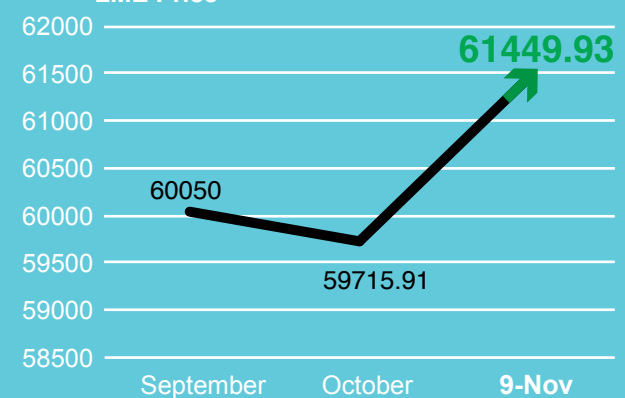
\$US/t



#### COBALT

LME Price

\$US/t



#### ALUMINIUM

LME Price

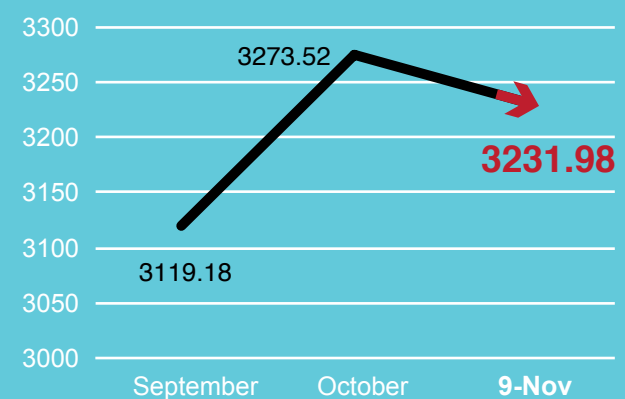
\$US/t



#### ZINC

LME Price

\$US/t



#### LEAD

LME Price

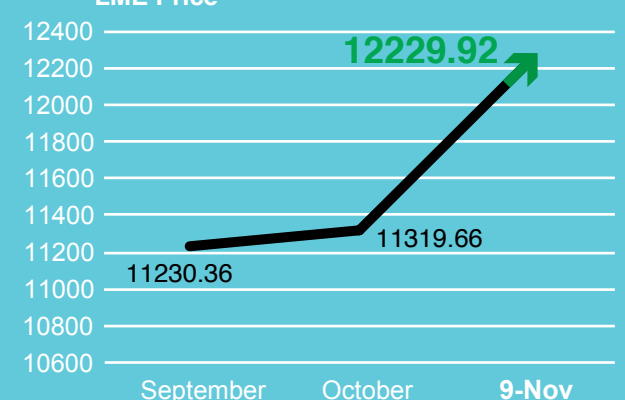
\$US/t



#### NICKEL

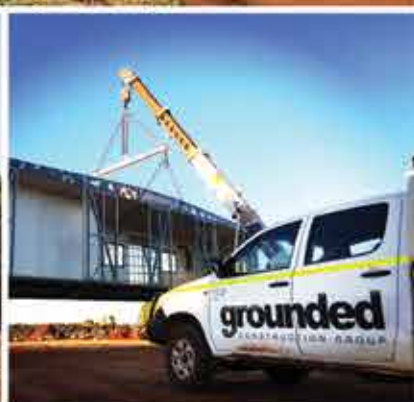
LME Price

\$US/t





# 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.

☎ 08 9321 3398 ✉ [paul.natoli@groundedgroup.com.au](mailto:paul.natoli@groundedgroup.com.au)

📍 Suite 7, Level 3, 1111 Hay Street, West Perth, WA 6005



# CU-River inks \$800mill Cairn Hill funding deal

**REUBEN ADAMS**  
SOUTH AUSTRALIA

AN \$800 million expansion of CU-River's Cairn Hill magnetite operations near Coober Pedy could create up to 1300 jobs, providing another shot in the arm for South Australia's resurgent mining sector.

The privately owned CU-River Mining Australia has reached a funding agreement with its offtake partner, Chinese steel producer Jiujiang, who will finance new infrastructure to increase output; a 13,000m exploratory drilling program; and development of the Snaefell and Tomahawk projects near Cairn Hill.

Part of the funding would be used for associated infrastructure work, including road and rail upgrades and extensions.

The proposed development timeline would see CU-River triple magnetite production to 3mtpa from two additional pits at Cairn Hill, before ramping up to a 15mtpa production target across an estimated mine life of 30 years.

"In the past year or so we have produced and exported one million tonnes of feedstock to Jiujiang Australia's parent company in China," CU-River managing director Yong Gang Shan said.

**"Our immediate target starting late 2018 is 3mtpa, rising to 15mtpa when projects that we already have in the pipeline go into production."**

"Our immediate target starting late 2018 is 3mtpa, rising to 15mtpa when projects that we already have in the pipeline go into production.

"We have received approval for the expansion of Pits 3 and 4 at Cairn Hill, which are the keys for the immediate increase in our production, and a 13,000 metre exploratory drilling program is currently underway to define the resource in pits 1, 2, 3 and 4."

CU River has committed to using South Australian suppliers wherever possible on the project.

"We will be using South Australian suppliers for goods and services wherever possible, so there is a flow-in effect in terms of secondary job creation and stabilisation," Mr Yong Gang Shan said.

"The industry standard is that as a general rule, every job in the mining sector creates three support jobs elsewhere.

"We now have offices in Adelaide and Coober Pedy and we are going through a process of recruitment for key positions.

"It is company policy to employ our own people for exploration and mining work, rather than outsource to subcontractors."

The announcement comes after approval was granted for Iron Road's \$4.5 billion Central Eyre Iron Project, which could create about 2000 jobs, and plans by the new owners of the Whyalla steelworks to increase production of iron ore from the Middleback Ranges.

Minister for Regional Development Geoff Brock said this proposed investment in regional South Australia was welcome news for mining workers and businesses.

"This long-life project shows that unlocking the full potential of our magnetite assets can create hundreds of jobs for the Far North and new infrastructure that can boost our export potential," he said.

Privately-owned CU River is one of two magnetite producers in South Australia and has been operating Cairn Hill since 2016.

In June 2014, Cairn Hill was placed into administration by former owner IMX Resources who was one of the first victims of a free-falling iron ore price.

CU River, which bought the failed mine in April 2015 from the liquidator of IMX, originally intended to extract copper and gold at the site but later switched its focus to iron ore after securing investment from Jiujiang.

## Architect plans for \$100m mining museum

**ELIZABETH FABRI**  
WESTERN AUSTRALIA

FORMER WA Government architect Steve Woodland has unveiled plans to build a \$100 million mining museum in Perth to pay homage to the State's rich mining history.

Mr Woodland, who now works as a principal director at architecture firm Cox, said the proposed museum would act as an educational facility for children, and a place for events and celebrations.

"The Museum of Mining WA could offer experiences like no other in the world," Mr Woodland said.

"Mining is in many ways a central part of who we are and yet our visitors see very little evidence of it in our city. Mr Woodland said immersive technologies would be utilised to "transport the visitor" into the mining arena to witness sounds and shocks of a mining exploration, be submersed below an oil rig rich in marine life, and drive a Haulpak truck by remote control.

The museum would also be home to an actual mine shaft, a real pit and other simulators to give visitors "compelling authentic experiences".

Mr Woodland hoped the museum would be built over the next 10 years, and had his sights set on the old East Perth power station or the Burswood Peninsula as possible locations.

"The museum would be a potent tourism driver for WA," he said.

# Hunter coal jobs on rise

**"There's been a sustained recovery in business conditions for coal mining in NSW over the last 18 months, with increased commodity prices delivering jobs in our coal mining regions."**

Hunter Valley Operations, NSW.

**ELIZABETH FABRI**  
NSW

HEALTHY demand for coal from key international markets is delivering more jobs for the NSW mining industry, according to NSW Minerals Council chief executive Stephen Galilee.

Recent figures from industry organisation Coal Services reported more than 20,600 coal production jobs across the

State in July; 1300 additional jobs year-on-year, and the highest amount since March 2015.

Of the newly created jobs, more than 1000 were based in the Hunter Valley, signalling good news for the 8000 plus mining supplier businesses across the region.

"Our NSW coal mining communities have done it tough over the past few years, so this jobs boost mining is really good news

for local economies," Mr Galilee said.

"There's been a sustained recovery in business conditions for coal mining in NSW over the last 18 months, with increased commodity prices delivering jobs in our coal mining regions.

"With the right policy settings that make the most of growing opportunities, our coal mining industry can continue to deliver employment, investment and economic stability well into the future."

Image: Yancoal.





# ACHIEVING FUTURE GROWTH



## NEED APPROVAL?

Soilwater group provides a one-stop-shop for the life cycle of your project. We can obtain all necessary approvals for any jurisdiction or commodity for any stage or size projects. We can complete all relevant environmental studies in-house and can work with you to develop, construct, mine and close your project.



## WE PROVIDE:

- Government liaison
- Stakeholder consultation and engagement
- Risk and compliance
- Mining securities and closure cost estimation
- Environmental and works approvals
- Material characterisation
- Geotechnical engineering
- Biological surveys
- Hydrology & hydrogeology assessments
- Laboratory analysis
- Plant decommissioning and demolition
- Rehabilitation & closure planning and implementation



Soilwater group has an in house laboratory to ensure projects are completed on time and on budget.

CONTACT US to discuss how we can help you ensure the success of your project and to Achieve Future Growth

(08) 9228 3060

[www.soilwatergroup.com](http://www.soilwatergroup.com)

[admin@soilwatergroup.com](mailto:admin@soilwatergroup.com)



## IN BRIEF

### \$440m contract win for Thiess

MINING SERVICES/WA

CIMIC Group's mining services provider Thiess has continued its winning streak with two new contracts for a combined value of \$440m at BHP Billiton Mitsubishi Alliance's (BMA) Caval Ridge and Peak Downs coal mines in QLD's Bowen Basin.

Over three years, Thiess will deliver mining services for specific components of work including the Caval Ridge Southern Circuit.

Thiess managing director Douglas Thompson said the company was proud to partner with BMA as it builds on its long history in Central QLD.

"This contract will enable Thiess to deliver productivity efficiencies, working with BMA to bring additional job opportunities to the region," Mr Thompson said.

### WGP on track for March production

GOLD/WA

MINCOR's 267,100oz Widgiemooltha gold project (WGP) in WA continues its march toward an early 2018 first production date.

WGP mining operations have started after key approvals were received, with only minor approvals required before the project was "shovel ready".

A resource update incorporated the results from two drilling programs, which also led to the exciting Flinders West discovery.

Flinders West could be mined early and potentially improve start-up cash-flows.

"Importantly, the mineralisation trends around Flinders remain open," Mincor managing director Peter Muccilli said.

"Results from the latest drilling program will give further insight into this potential."

### Hay Point drags down coal export volumes

COAL/QLD

OCTOBER coal shipments from the BHP Mitsubishi Alliance-owned Hay Point Coal Terminal slumped to its lowest level in years, according to North Queensland Bulk Ports Corporation data.

Hay Point exported just 2.95mt; down 19 per cent year-on-year and 33 per cent month-on-month.

In October, A total of 11.9mt of coal was shipped from Hay Point, Dalrymple Bay and Abbot Point coal terminals; up 4 per cent from a year earlier but down 11 per cent from September.

It represents the smallest monthly volume since May, when exports stood at 10.16mt.

# Sodexo acquires Morris



Sodexo integration director Keith Weston and Morris Corporation chief executive Fiona Berkin.

**CAMERON DRUMMOND**  
WA/QLD

FRENCH-based services provider Sodexo has moved to purchase Australian competitor Morris Corporation for an undisclosed sum, increasing its QLD and WA footprint.

The transaction includes the transfer of Morris' management contracts at the three major Fortescue Metals camps of Cloudbreak, Christmas Creek and Port Hedland, as well as its Collinsville Village in QLD.

Sodexo has exponentially grown its Australian presence in the last two years.

In 2016, it won a \$2.5 billion contract to manage Rio Tinto's Pilbara operations, and earlier this year a further \$22m contract for the miner's Amrun bauxite project in QLD.

More than 98 per cent of Morris' employees have accepted employment offers from Sodexo.

Both companies started as caterers more than 50 years ago, and now offer facilities management services for clients in the energy and resources sectors; including accommodation systems and camp design,

administrative services, waste management and catering.

"We share similar values including a commitment to indigenous communities, and a focus on developing sustainable local businesses wherever we operate," Sodexo integration director Keith Weston said.

"We look forward to working together to improve quality of life for our clients and consumers as we develop exciting new business opportunities in Australia."

The combined entity will have an estimated 5200-strong personnel base across Australia.

# Metso increases Australian footprint

**REUBEN ADAMS**  
NSW

GLOBAL industrial company METSO has strengthened its Australian market position in mining services with the acquisition of wear lining solutions provider WEARX for an undisclosed sum.

Headquartered in Newcastle, and with operations in Ballina, Orange and Perth, WEARX has about 140 employees and recorded FY17 sales of \$35 million.

WEARX chief Gary Newman said the company had worked hard to turn itself into an agile service provider, but the backing of a larger company was necessary to unlock "our full potential".

"With the funding of the next phase of our company's growth in mind, we decided that a full trade sale to a large, likeminded company was the best way to continue the evolution of our business."

Metso's senior vice president for the Australian Market Areas Ross Wotherspoon said the acquisition was part of a wider company strategy which included both organic growth and growth through acquisitions.

"We want to make sure that the transition



The WEARX acquisition strengthens Metso's Australian position in mining services.

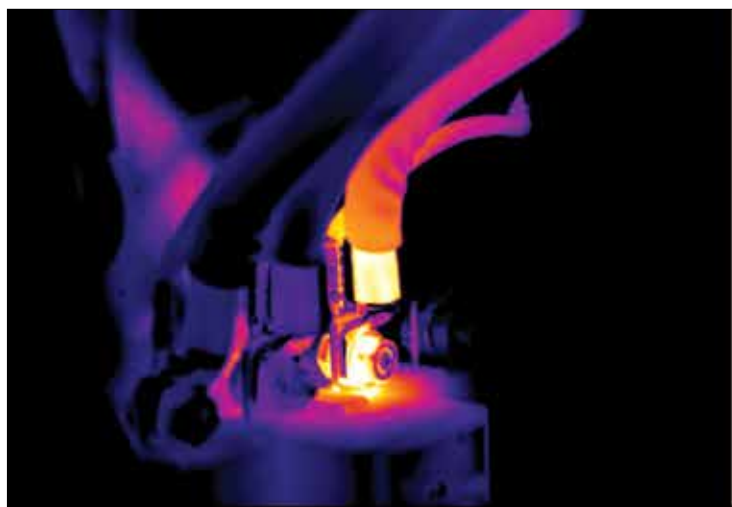
goes smoothly, especially for staff and customers," Mr Wotherspoon said.

"The retention of WEARX's agility and entrepreneurial spirit is a fundamental

success factor."

The companies have assembled a dedicated team to work on all aspects of the integration, expected to take about 6 months.





# Infrared Viewing Windows

The H.VIR Infrared Window enables permanent access for inspection of electrical components in a safe and simple way without disturbing operations, particularly high voltage areas. The windows are easily fitted into electrical equipment such as switchboards and transformer panels to give safe access for infrared inspections of critical components like connections, switches and bus bars.





## Our Services

- Thermographic surveys
- H.VIR Infrared Viewing Windows
- Ultrasonic testing
- Specialist consultancy
- MyAssetView cloud-based software

Monitoring carried out without the need to disrupt power supply

- Eliminates danger of electric shock
- 98% transmission of infrared wavelengths
- 100% transmission of visual wavelengths
- Easy installation
- Non-intrusive inspections with no downtime
- Various sizes & large field of view
- Available in short wavelength or long wavelength

**1300 300 159**  
[admin@thermoview.com.au](mailto:admin@thermoview.com.au)  
[thermoview.com.au](http://thermoview.com.au)





# blueprint *for better.* wealth

Blueprint Wealth has been helping mining families across Australia to manage their money and save for their goals for more than 15 years. We help people build a future where working in mining is your choice, not an economic necessity.

Mention this ad when you book an appointment with a Blueprint Wealth financial advisor to receive a complimentary Australian Geographic subscription\*.

**1300 739 827 | [help@bpwealth.com.au](mailto:help@bpwealth.com.au) | [bpwealth.com.au](http://bpwealth.com.au)**

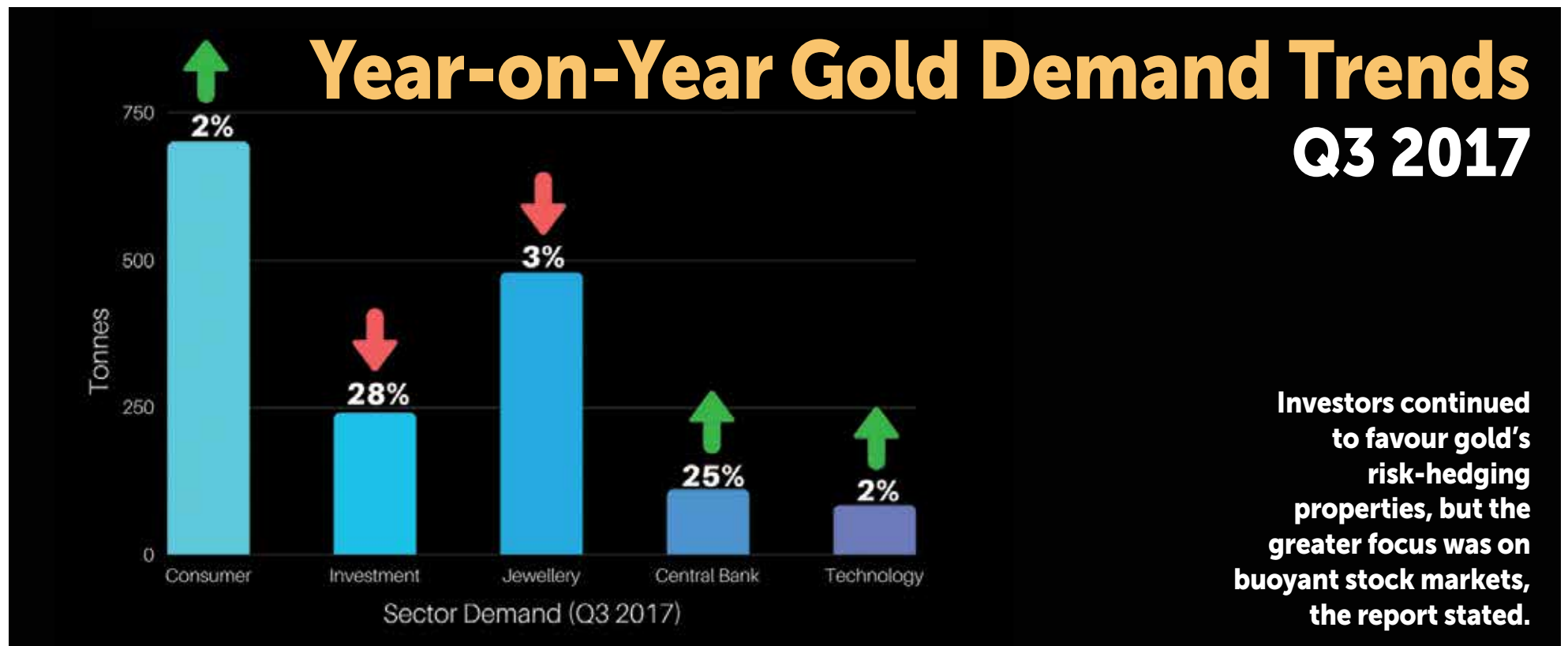
Blueprint Planning Pty Ltd ABN 78 097 264 554 trading as Blueprint Wealth is an authorised representative and credit representative of AMP Financial Planning Pty Limited, AFSL and Australian Credit Licensee. This advertisement contains general information only. It does not take into account your objectives, financial situation or needs. Please consider the appropriateness of the information in light of your personal circumstances.  
 \*You will qualify for the free Australian Geographic 6-month subscription after attending your initial appointment with a Blueprint Wealth financial advisor.

Accredited by **AMP Financial Planning** 



# Gold demand at 8yr lows

Weak jewellery sector, ETF inflows blamed: World Gold Council



## REUBEN ADAMS GLOBAL

SOFT jewellery sector demand and lower inflows into exchange-traded funds (ETFs) in Q3 2017 are blamed for the lowest level of global gold demand since Q3 2009.

According to the World Gold Council's latest *Gold Demand Trends report*, the 9 per cent year-on-year drop to 915 tonnes (t) was attributed to a 3 per cent fall in global jewellery demand, as India's new GST and tighter anti-money

laundering regulations deterred buyers.

Inflows into gold-backed ETFs grew by just 19t compared with the remarkable 144t influx in Q3 2016.

Investors continued to favour gold's risk-hedging properties, but the greater focus was on buoyant stock markets, the report stated.

Alistair Hewitt, Head of Market Intelligence World Gold Council said it was a tough quarter for gold demand, but there were bright spots.

"Retail investment demand in China grew for the fourth consecutive quarter; the Turkish and Russian central banks added to gold reserves; and, after years of declines, we also saw increased use of gold in technology, supported by the demand for high-end smartphones," Mr Hewitt said.

Volumes of gold used in technology increased for the fourth consecutive quarter as strong demand for LEDs and continued growth in the use of 3D sensors in new smartphones boosted demand by 2 per cent.

Year-to-date technology demand was 244.4t;

representing the first increase since 2010.

The report noted the development of a gold-based catalyst that could improve the performance and efficiency of hydrogen-powered cars by US and Chinese researchers.

Writing in leading journal *Science*, researchers described the development of a gold nanoparticle/molybdenum-carbide catalyst which attained a high level of activity at low temperatures, producing the pure streams of hydrogen critical to efficient fuel cell operation.

## Third party access for CEIP infrastructure

### REUBEN ADAMS SOUTH AUSTRALIA

IRON Road has signed a MoU with newly-formed farmers' co-operative EPCBH to establish a grains export business using Iron Road's planned Central Eyre Iron Project (CEIP) infrastructure.

The MoU follows a similar partnership between Iron Road and Sumitomo subsidiary Emerald Grain, which is investigating the development of a new grain distribution and supply chain network.

Iron Road managing director Andrew Stocks said the CEIP would unlock significant benefits well beyond the project's mining and ore processing operations.

"We operate on a principle of third party access to our planned infrastructure business," he said.

"The approved deep water port at Cape Hardy will be a first for South Australia and a fresh approach to infrastructure development in the region.

"Our ongoing partnership with Emerald Grain, now complemented by EPCBH, will also ensure maximum benefit for local communities and the region."

## Australian Mines banks \$20m for Sconi



### CAMERON DRUMMOND QLD

AUSTRALIAN mines has tapped investors for \$20 million in a heavily-oversubscribed capital raising for its Sconi cobalt-nickel-scandium play in Northern QLD.

The funds will be used to continue trial mining and undertake a bankable feasibility study, due to be completed in April 2018.

The budding cobalt miner is also constructing a demonstration-size processing plant capable of producing commercial-grade samples of cobalt sulphate, nickel sulphate and scandium oxide.

These samples will be used to progress negotiations with potential off-take partners and financiers, the company stated.

In March, a Sconi pre-feasibility study (PFS) reported a mineral resource of 514,000 tonnes (t) of nickel, 54,500t of

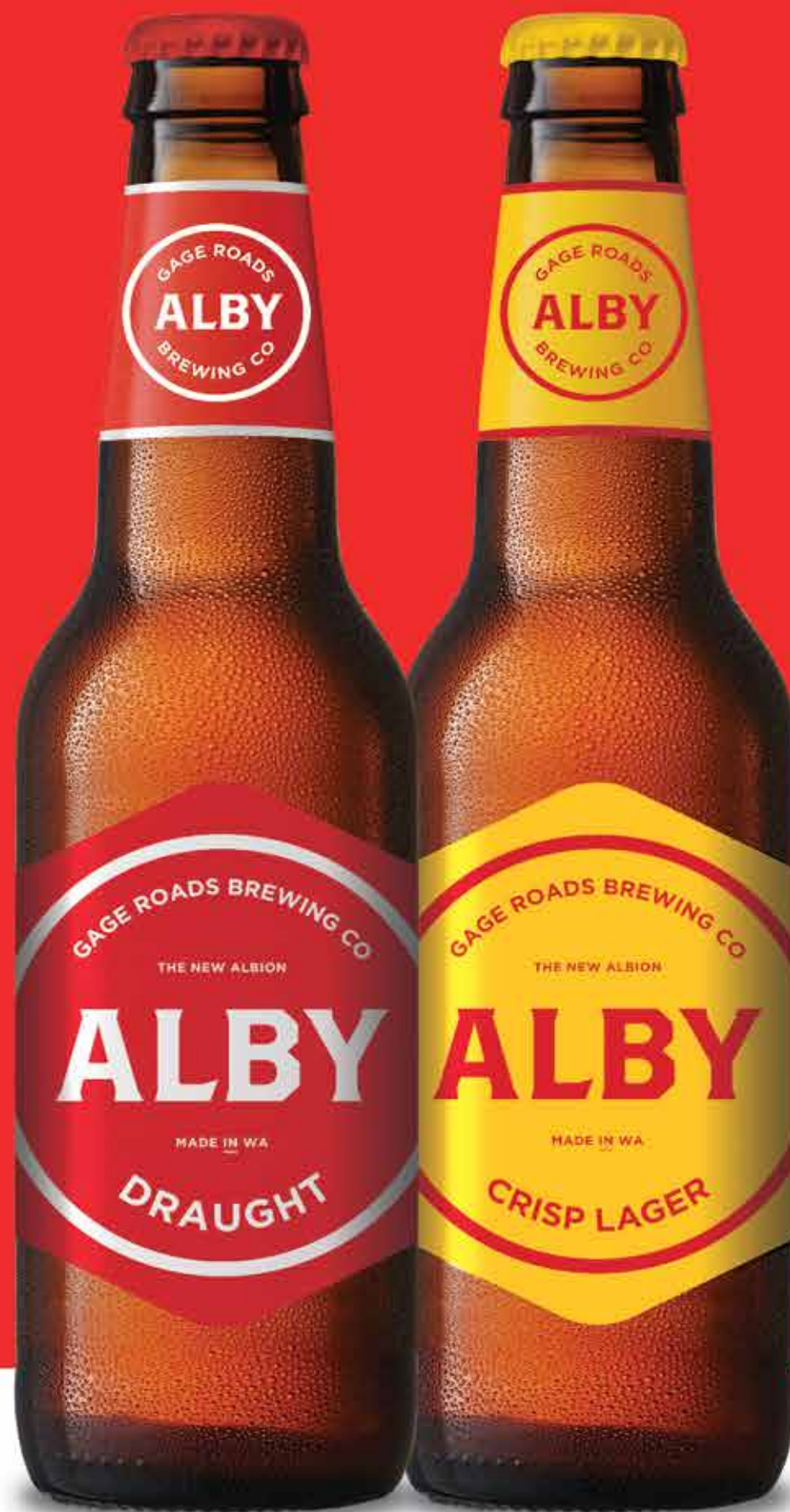
cobalt and 1950t of scandium, making it one of the most prospective projects of its kind in Australia.

At its NSW Flemington project, which shares the same orebody as CleanTeQ's Sunrise project, Australian Mines would extend and increase the mineral endowment through a series of drilling campaigns, with a PFS to be completed by mid-2018.

Exploration results at its greenfields Thackaringa cobalt project in NSW are due in December.



# WA'S NEWEST, OLDEST BEER



In 1837 the Albion Brewery poured WA's first beer. 180 years later we bring you the *NEW* Albion and ALBY: locally brewed. We use 100% WA-grown barley because it's the best in the world. This is beer proudly made in WA, for locals, by locals.

[WWW.ALBY.BEER](http://WWW.ALBY.BEER)



## CONTRACTOR RESULTS WRAP

### Downer ASX:DOW

- NPAT increase of \$0.9 year-on-year to \$181.5m
- \$0.9m year-on-year Revenue increase to \$277.8m
- Cash flow of \$441.6m
- Work-in-hand of \$22.5bn, up from \$21.1bn

Downer's mining service line reported lower revenue due to the expiry of its FMG Christmas Creek contract in September last year.

Overall, its FY17 results were strong as it continued to focus on growth in public infrastructure and service delivery.

### NRW Holdings ASX:NWH

- 25% NPAT increase year-on-year to \$28.5m
- 20% year-on-year revenue increase to \$370.2m
- Debt reduced by \$38.5m to \$20.8m
- Work-in-hand of \$1.4bn, with tender pipeline of \$6bn

NRW's civil and mining business continued its focus on widening its client base during FY17, securing contracts with Pilbara Minerals, Altura Mining, Rio Tinto coal, alumina and iron ore projects and FMG.

It also recently secured work at OZ Minerals' Carrapateena project, Gascoyne Resources' Dalgara project and acquired east coast mining services business Golding for \$85m.

### CIMIC Group ASX:CIM

- 21% NPAT increase to \$501m
- 26% year-on-year revenue increase to \$9.6bn
- Net cash of \$606m
- Work-in-hand of \$13.4bn, with tender pipeline of \$23bn.

To date, CIMIC delivered more than 20 PPP projects for a value of \$32bn.

So far during this year its mining services arm Thiess has won contracts at FMG's Solomon Hub iron ore operation, BMA's Jellinbah East and Yallourn operations, and at Gunung Bara Utama and Kaltim Prima Coal in Indonesia.

### Monadelphous Group ASX:MND

- 14% NPAT decrease to \$57.6m
- 7.3% year-on-year revenue decrease to \$1.26bn
- Net cash of \$228.1m
- Work-in-hand of \$1.8bn

Monadelphous' engineering and construction division reported sales of \$615.4m during FY17.

It was recently awarded contracts at FMG's Solomon Hub, BHP's Olympic Dam, and a range of offshore and onshore oil and gas projects in Australia and abroad.

# Major wins for Decmil

## The year ahead

Decmil estimates that WA iron ore replacement volume projects and sustaining capital works will provide a **+\$10 billion lift** to WA resources construction activity from 2018.

Decmil had over **\$300m** of contracted and visible work in hand for FY18 (August 2017)



The Mulla Mulla contract was one of many Decmil has secured with BHP.

### ELIZABETH FABRI WESTERN AUSTRALIA

BHP has awarded Decmil Australia a \$75 million contract to undertake expansion works at its Mulla Mulla accommodation village in the WA Pilbara.

The contract is the first phase of a \$105 million village expansion to support current operations at Mining Area C and the proposed \$US3.2 billion South Flank iron ore project.

Decmil managing director and chief

executive Scott Criddle said the contract followed a \$13m civil and initial works contract awarded in August.

"The contract award is following the successful delivery of other project works at major WA iron ore sites," Mr Criddle said.

"Decmil has achieved great success in delivering complex projects across the region, reinforcing our expertise and 40 years of experience as a sector contractor.

"We look forward to further solidifying our growth path and long-standing relationship

with BHP."

Decmil's previous BHP contracts included building a logistics hub at Port Hedland, the construction of a tailings storage facility at Olympic Dam in South Australia, concrete works and the construction of cooling towers at Ravensthorpe nickel operations, and various facilities at BHP's Newman Hub and Jimblebar projects in WA.

Decmil has also recently completed works for other iron ore majors, such as Fortescue Metals Group, Roy Hill, and Rio Tinto.

# Emeco's tour de Force

### CAMERON DRUMMOND NATIONAL

MINING equipment supplier Emeco Holdings will expand its market share with the \$69.8 million purchase of national supplier and maintenance provider Force Equipment.

The acquisition will provide Emeco with a further 179 high-quality and low-hour machines, taking its fleet total to 897, and doubling its WA presence.

The transaction price is about 2.96 Force's FY17 EBITDA of \$23.6m, with Emeco funding the purchase via an \$80m equity raising.

Emeco managing director Ian Testrow said the buyout of Force was a part of the company's strategy to becoming a world leading provider of equipment rental.

"The acquisition of a market leading business like Force will allow Emeco to grow our rental business in key markets, enhance all important maintenance capabilities and diversify our customer exposure, including in the iron ore market in WA through its workshop in the Pilbara," Mr Testrow said.

"Force's component rebuild capability will also mitigate risk of component supply disruption at a critical time in the market."

Mr Testrow said Emeco would welcome Force's 200 employees at supply bases in Perth, Kalgoorlie, Port Hedland and Mackay to stay



Emeco has expanded its business at a critical time in the market.

on, and looked forward to working with Force's management team to realise the company's growth strategy.

"Management's focus for FY18 continues to remain on ensuring the health and safety

of Emeco's employees, maximising return on capital, disciplined cost management, reducing our debt and exploring additional strategic consolidation opportunities to grow the business," Mr Testrow said.



# Often Challenged



# Never Beaten



## 15 TO 600 TONNE

 **BIGLIFT**  
CRANES AND  
HEAVY HAULAGE

**Ph: 6541 0033**  
**[www.bigliftcranes.com.au](http://www.bigliftcranes.com.au)**



# A winning partnership

**CAMERON DRUMMOND**  
QLD

BRISBANE-BASED mining equipment, technology and services (METS) company Commit Works and miner Anglo American have won the 2017 METS Ignited *Collaboration Award* for the Visual Ops real-time platform.

The award was presented to Anglo American executive head of underground operations for Moranbah and Grosvenor Glen Britton, and Commit Works chief executive Paul Moynagh at a gala industry dinner in Melbourne on 1 November.

Mr Moynagh said the award was recognition for years of hard work developing platforms for managing frontline work plans delivering safer and more productive mining operations.

“Our job is to make software tools that ensure people go to work every day with a plan,” Mr Moynagh said.

“Planned work is much safer and far more productive than unplanned work, and that has been reflected in the results that Anglo has seen over the last five years.

“The sites that use our short-term planning and scheduling system quickly get to the point where they can actually rely on their shift plans to lead their teams and track results in short intervals.



Image: METS Ignited.

METS Ignited present the award to the teams from Commit Works and Anglo American.

“Visual Ops makes this even more powerful by making it possible for everyone on site to clearly see any hazards alongside the people, equipment and work that is being done, all in one very visual platform on phones, tablets or big screens all over site.”

Anglo American and Commit Works

co-designed and implemented the unique visual management system that provides real-time operations mapping to monitor the progress of work onsite.

The system provides supervisors and crew with context-rich awareness of the location of hazards, people, equipment and tasks,

assisting to improve safety and productivity.

The Award, in its second year, acknowledges and recognises organisations that contribute to a culture of collaboration within the mining innovation ecosystem and achieve mutual business gains as a result of successful collaboration.

## Goldfields innovation hub opens

**ELIZABETH FABRI**  
WA

THE Chamber of Minerals and Energy (CME) WA has joined forces with the Cooperative Research Centre for Optimising Resource Extraction (CRC ORE) to establish a new mining innovation hub in the heart of Kalgoorlie.

The Kalgoorlie-Boulder Mining Innovation Hub brings together some of the country’s top engineers, scientists and mining experts to test new technologies aimed at revolutionising the way mineral deposits are mined to maximise profits and minimise environmental impacts.

The hub will also provide training for mining professionals with support from industry partners such as Curtin University’s WA School of Mines (WASM) and the Central Regional TAFE.

Other partners included METS Ignited, the Minerals Research Institute of Western Australia (MRIWA) and the City of Kalgoorlie-Boulder.

CME chief executive Reg Howard-Smith said the new hub would strengthen WA’s reputation as a world-leader in the extraction and processing of previous metals and cement its standing as a centre of excellence in mining education and research.

“CME is thrilled to be playing such an important role in this project, which will go a long way in ensuring the long-term sustainability and profitability of the industry,” Mr Howard-Smith said.

## World-first trial for drone tech



Image: CSIRO.

“The program is providing vital learnings for us as we prepare to commercialise Hovermap.”

Drone flying autonomously underground using Hovermap payload technology.

**ELIZABETH FABRI**  
NATIONAL

CSIRO digital research arm Data61 has developed a new autonomous drone payload technology to map complex 3D environments in previously inaccessible mine areas.

The Hovermap drone payload technology, established by Data61 principal research scientist Stefan Hrabar, was launched earlier this year and has since completed multiple autonomous test flights.

Recently, it recorded the world’s first autonomous beyond line-of-sight drone flight 600m underground.

The new technology uses a single lidar and advanced algorithms to provide SLAM-based mapping, omnidirectional collision avoidance, GPS-denied flight and advanced autonomy for industrial drones to undertake mapping of drives and stopes, which are normally too dangerous to access.

Mr Hrabar said Data61 already had four participants in an early adopter program – Insitu Pacific, Smart Survey, NQ UAV and

The Little Ripper Group – that are using Hovermap for the inspection of underground and open-cut mines, railway tunnels, bridges, constructions sites, telecommunications and oil and gas infrastructure.

“The program is providing vital learnings for us as we prepare to commercialise Hovermap,” Mr Hrabar said.

“It is helping us to validate the product-market fit and learn where Hovermap provides the greatest value.

“We’ll iterate and adapt to ensure we’re solving real problems in these markets.”





## Your total build solution partner for light fleet modification.

Minecorp leads the light vehicle modification industry with high quality and innovative total build solutions and products. We deliver comprehensive fleet modification services on time and on budget, working with clients every step of the way to ensure vehicles are fit for purpose and totally compliant with the regulatory requirements of all industries.

We manufacture, distribute and install light vehicle equipment to protect employees and assets, even in the harshest working environments. Our fit-outs are backed by extensive research and development and rigorous testing, which means better vehicle functionality and lower total cost of ownership for fleet operators.

1300 922 881

@ sales@minecorp.com.au

W minecorp.com.au

Member of RMA

**MINECORP**  
YOUR FLEET FIT-OUT SPECIALISTS



## IN BRIEF

## Centerra in friendly takeover of AuRico Metals

CANADA

CENTERRA Gold has bought out fellow gold developer AuRico Metals for C\$310 million.

AuRico is developing the Kemess brownfields gold project in British Columbia, and owns a royalty portfolio that includes a 1.5 per cent net smelter return ("NSR") royalty on the Young-Davidson gold mine in Ontario and a 2 per cent NSR royalty on the Fosterville mine in Australia.

Together with its Kumtor mine in the Kyrgyz Republic and the Mount Milligan mine in British Columbia, Centerra expected to be firmly established as a low-cost gold producer with a geographically diversified footprint.

## B2Gold flags early start to Fekola

AFRICA

CANADIAN miner B2Gold has completed construction of its Fekola gold mine in Mali and has flagged commercial production to start this month, four months ahead of schedule.

According to its Q3 report, B2Gold began processing ore from Fekola in September, and achieved first pour at the mine on 7 October.

The mill treated 324,525 tonnes of ore at an average grade of 3.40 grams per tonne (g/t) – above its budgeted mark of 2.33g/t – to produce a total of 33,946 ounces of gold in the month.

Over its initial ten year mine life, Fekola is projected to produce an average of 345,000ozpa at an AISC of \$664 per ounce.

## China becomes net graphite electrode importer

CHINA

IN a striking shift, China has become a net importer of graphite electrodes after shuttering 30 per cent of its capacity, according to a note from investment bank Jefferies.

Graphite electrodes are the main heating element used in an electric arc furnace, a steelmaking process where scrap is melted to produce new steel, according to *Reuters*.

In recent years producers outside of China have slashed production of smaller electrodes – primarily used in ladle furnaces – as they could not compete with Chinese producers.

The tightness currently seen in the market – caused by lower Chinese exports, tight needle coke supply and strong demand – could persist for at least two years, Jefferies stated.

## Cameco suspends operations

**"We can't control the market so our focus is on positioning the company to weather the continued low uranium prices and have uncommitted, low-cost supply to deliver into a strengthening market."**



Image: Cameco.

Underground at Cameco's McArthur River uranium mine.

CAMERON DRUMMOND  
CANADA

URANIUM miner Cameco has suspended production at its flagship McArthur River mine and Key Lake milling operations in Canada's Saskatchewan province due to "unsustainably low" uranium prices.

The operations will be suspended for 10 months, leading to the temporary loss of 845 jobs, and the company's annual dividend would be reduced 32 cents down to 8 cents

per share in 2018.

The Canadian miner said uranium prices had fallen 70 per cent since the Fukushima disaster in 2011.

"Cameco has been partially sheltered from the full impact of weak prices by its portfolio of long-term contracts, but those contracts are running out and it is necessary to position the company today to generate cash flow if prices do not improve," the company stated.

"To date, we have made good progress in reducing costs but unfortunately given the

continued market weakness, more needs to be done," Cameco chief executive Tim Gitzel said.

"We can't control the market so our focus is on positioning the company to weather the continued low uranium prices and have uncommitted, low-cost supply to deliver into a strengthening market."

The announcement caused a positive reaction from other miners in the beleaguered uranium sector, as the mine closure should reduce 2018 supply levels by about 15 million pounds and drive an increase in uranium spot prices.

## Exceptional grades at Kildare

ELIZABETH FABRI  
IRELAND

PERTH-based explorer Zinc of Ireland has discovered 'exceptional' high-grade, shallow mineralisation at its Kildare zinc project south-west of Dublin, Ireland.

On 8 November, Zinc of Ireland announced it had intersected multiple zones of high-grade zinc mineralisation in the shallow regions of the Celtic Tiger and McGregor prospects.

**"Zinc of Ireland managing director Peter van der Borgh said the results were a "clear game-changer" for the company and the future of the Kildare zinc project."**

Drilling results included up to 25 per cent zinc and lead within 200m of surface at Celtic Tiger, confirming potential for shallower mineralisation across the project.

The company also confirmed potential to upgrade the current inferred resource, which currently stands at 5.2 million tonnes (mt) at 8.6 per cent combined zinc and lead.

Zinc of Ireland managing director Peter van der Borgh said the results were a "clear game-changer" for the company and the future of the Kildare zinc project.



Image: Zinc of Ireland.

"From an exploration perspective, this means cheaper and quicker drilling for shallower targets, while the presence of shallower, more accessible mineralisation will obviously translate into improved economics when we undertake future financial modelling of the project," he said.

"It also brings into play more than 4km of similar geology along the Western Margin of the Graben, as well as similar structural settings that we are identifying elsewhere within the

project and beyond. And then of course there's proof of concept for our exploration model, which also has widespread application."

The company will continue drilling at Celtic Tiger over the coming months, with a further two or three holes scheduled to be completed before Christmas.

An updated mineral resources estimate for Kildare and maiden exploration target for the Celtic Tiger project was also planned for Q1 2018.



# WA ROPES & HARDWARE

## FOR ALL YOUR ROPE, CORD, TWINE AND NET NEEDS.

### DYNEEMA

High breaking strength 12 strand rope. Strong, light, compact, safe, UV stabilised for long life, easily recoverable, balanced and easily spliceable.

### CYCLONE TIE DOWN NETS

Available with rope borders and tie downs. Available in sizes 4m x 4m, 5m x 5m, 6m x 6m, 10m x 10m, 12m x 12m, 10m x 20m, 15m x 20m and 10m x 30m.

### BOG STROPS

Plasma Vehicle recovery tow strops replace wire rope. Lightweight Strong and safe.

### SQUARE ROPE

8 Strand Mooring Lines. Available in 20mm to 96mm Hi-Tensile Polypropylene. 2m eye splice both ends with canvas cover.



☎ 9249 8578  
✉ sales@waropes.com.au  
🌐 www.waropes.com.au

**WA ROPES**  
& HARDWARE



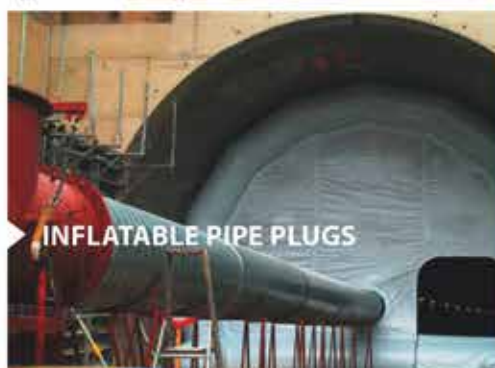
POND LINERS



LARGE SCALE LIQUID  
STORAGE BLADDER TANKS



TANK LINERS



INFLATABLE PIPE PLUGS



UNDERWATER LIFT BAGS



WATER WEIGHT BAGS



Fleximake is an Australian owned manufacturing company, who specialise in producing flexible products for all residential, industrial and rural applications. We also design and manufacture custom products, so you can be sure to get exactly what you want. Our vision is to provide innovative solutions for every application.

To guarantee the strength and durability of our products we only source material that are up to Australian standards, while utilizing the latest welding techniques. We know our growth is built on our customer satisfaction, so we are dedicated in providing timely service and an affordable price to every client.

1300 195 295  
+61 3 8772 2228

Fleximake Pty Ltd

11 Elliott Road, Dandenong South, VIC 3175

Fax: +61 3 8774 7772

Email: sales@fleximake.com.au

Web: fmindustrial.com.au





# CU AT THE TOP

Copper is in favour as demand picks up in China, while electric vehicle and the renewables boom looks to build sustainable price momentum into the future. Yet the base metal, as is the case for many commodities in 2017, has also been defined by its volatility. Will the good times continue?

ELIZABETH FABRI

COPPER has been a particularly interesting commodity to watch throughout the 2017 year.

On the back of sudden price gains in late 2016, the base metal had a volatile start to the year, continuing its upswing in the first few months (due to supply disruptions at three of the world's largest mines) before plummeting to three-month lows in April.

As analysts predicted, the slump was short-lived with prices surging again in July on renewed optimism amid demand growth in China and a weaker US dollar.

By mid-October, prices spiked further to \$US7186 a tonne, before settling at \$US6800 a tonne at the end of the month; still a 24 per cent increase on January levels.

While there has been much debate on where the copper will sit moving into the New Year, a common thread among analysts is that the long-term fundamentals for the metal remain strong.

KPMG national and global copper leader Maritza Aranedo said despite recent volatility prices were headed in the right direction.

"In my view, the market should swing into a deficit (undersupply) position in early 2018, meaning that copper prices should not drop below current price levels," Ms Aranedo said.

"This is good news for miners who have gone through difficult times over the last two years and have had to reduce costs to manage their cash flows.

"There is also potential for further upside in the near term; supply disruptions may continue in the second half of 2018, as a number of mines in Chile have worker contracts up for renewal.

"Accordingly, gradual price increases should start to be more pronounced from Q3 2018 onwards and this time the higher prices will be here to stay."

S&P Market Intelligence senior research analyst Adam Webb was also optimistic, but warned of increased year-on-year mining costs.

Mr Webb said since early last year, which marked an arrest in the copper price decline that had been in evidence since 2011, there has been less pressure to cut costs at copper mining operations.

"However, since early 2016 many local producer currencies have strengthened against the US dollar, alongside a strengthening oil price, which has led to some upward pressure on copper mining costs," Mr Webb said.

"Total cash costs in the copper-mining sector are expected to be approximately 6 per cent higher in 2017 compared with 2016."



Escondida copper mine, Chile.

Looking ahead into 2018, Mr Webb expected only 2 per cent of copper supply to have an AISC above the forecast copper price for the year, signalling little pressure for copper miners to cut production.

"We expect profit margins to end this year significantly higher than in 2016, and that those margins will be preserved into 2018 and 2019," he said.

Deloitte Energy & Resources industry group audit partner Ryan Hansen said copper futures on COMEX trading were currently at their highest since February 2014, with the market bullish for 'good reasons'.

"Copper's supply/demand fundamentals are some of the best in the commodity pack," Mr Hansen said.

**"Accordingly, gradual price increases should start to be more pronounced from Q3 2018 onwards and this time the higher prices will be here to stay."**

"You have the combination of long-term structural supply constraints (falling ore grades, supply disruptions at key copper mine operations, slowing global mine supply growth, shortage of world class copper deposits, etc) together with some decent demand side support.

"Copper's a classic 'bellwether'

commodity with copper demand and prices highly correlated with economic activity."

However, Mr Hansen said there was "significant caution to be had" around the large quantity of speculative capital in copper.

"There's a sense copper prices are currently running ahead of fundamentals and are not sustainable at this level," he said.

"The risk of so much hot money going into copper is it can easily be pulled out if perceived returns are higher elsewhere or there's a negative economic shock somewhere."

Mr Hansen said the big concern was a slowdown in China's property sector, but if this corrected itself, so too will copper demand and pricing.

## Renewed focus

Armed with this knowledge, global producers such as BHP were shining a light on their current copper operations and pathways to ramp up production to meet demand.

At the LME Week Bloomberg Forum in London early November, BHP Americas operations president Daniel Malchuk said the miner was actively looking to add more copper resources to its portfolio.

"Copper has had great fundamentals for some time, and great potential due to the rapid rise in renewables and electric vehicles," Mr Malchuk said.

"Solar requires about five kilograms of copper per kilowatt – that's more than double the copper intensity than alternative forms of generation.

"Now turning to the highways, a hybrid car uses 40 kilograms of copper – that's twice the amount of copper a regular petrol car uses.

"This is an enormous amount of copper to source."

Mr Malchuk said BHP was well placed to support increased copper supply but faced a number of challenges including; declining grades, deeper deposits, harder ore, labour productivity, water scarcity, and higher expectations from host governments and communities.

"Grade decline alone has huge ramifications; industry grades are expected to decline by 17 per cent according to Wood Mackenzie data over the next decade," he said.

"Ageing mines require more effort and cost to deliver the same production.

"There will be a growing need for desalinated water to process the higher volumes of lower-grade ore."

Mr Malchuk said BHP was investing in exploration to uncover potential new discoveries closer to the surface.

"Based on total refined copper output, the value of the copper market could increase by over 50 per cent by 2035 – an opportunity worth seizing," he said.

"Now you see why copper is firmly on our radar."



# SPECIAL FEATURES

## THE HUNTER VALLEY

# BACK TO BLACK

Many Hunter Valley communities are intrinsically linked – historically and economically – to a mining industry which currently injects about \$6bn in wages and payments to local businesses each year. Now, as coal prices recover and stabilise, the Hunter's economy is set for a welcome boost.



Image: Rio Tinto.

### CAMERON DRUMMOND

WITH a 2016 population of 732,000, the Hunter Valley accounts for 28 per cent of NSW's inhabitants outside Sydney.

Since the early 1800s, the Hunter's mining operations have been a stalwart of economic activity in the region.

The Hunter is no stranger to coal price cycles. Having just navigated the post-global financial crisis depression, it is looking toward a brighter future as increased demand from Asian markets propels greater output from mines throughout the region.

#### Hunter Valley Coal Chain

The Hunter Valley Coal Chain provides about one-fifth of Australia's thermal and coking coal from 35 coal mines owned by 11 coal producers, under the auspices of the Hunter Valley Coal Chain Coordinator (HVCCC).

Mines near the eastern edge of the basin are spread along the Hunter Valley from Newcastle in the south, to Muswellbrook in the north; with mining further at Yarrawonga near Gunnedah.

Mines such as Ulan and Springvale in the Western Coalfield and Mandalong and Westside in the Newcastle Coalfield produce mainly thermal coal.

In the Hunter Valley coalfields, both soft coking and thermal coal products are produced from mines such as Hunter Valley Operations and Bulga.

The HVCCC was a concept created in 2003 to streamline production through



Image: Yancoal.

The HVCCC management entity was first implemented in 2003 to efficiently streamline coal operations to the Port of Newcastle.

a centralised planning model for the production, transport and export of coal from these sub-regions.

Coal is delivered from mines through four main rail haulage providers; Pacific National, Aurizon, Glencore and Southern

Shorthaul Railroad.

Collectively, they make more than 20,000 trips from more than 31 different loading points to the Port of Newcastle, the world's largest coal export operation, from distances of up to 380km away.

Product is then loaded onto more than 1400 coal vessels each year via three terminals controlled by Port Waratah Coal Services (PWCS) and Newcastle Coal Infrastructure Group's (NCIG).

PWCS is the largest terminal, facilitating about 70 per cent of throughput at Newcastle.

About 85 per cent of exports through the coal chain out of Newcastle are destined for Japan, Korea and Taiwan.

161.4 million tonnes (mt) of coal was exported through the Port of Newcastle during 2016, up 3.3mt from the previous year.

Exports continued to rise during 2017, with an increase of 2mt between January and August compared to the same period last year, reflecting the continued recovery and strong global demand for the commodity.

#### Weathering the storm

In the five years to 2016, 11 operating mines in the Hunter Valley had been shuttered.

More than 20 per cent of its coal mining workforce – about 3500 personnel – had been put out of work.

Long associated with coal mining, the Hunter's regional hub of Cessnock was not unaffected by the reversal of fortunes.

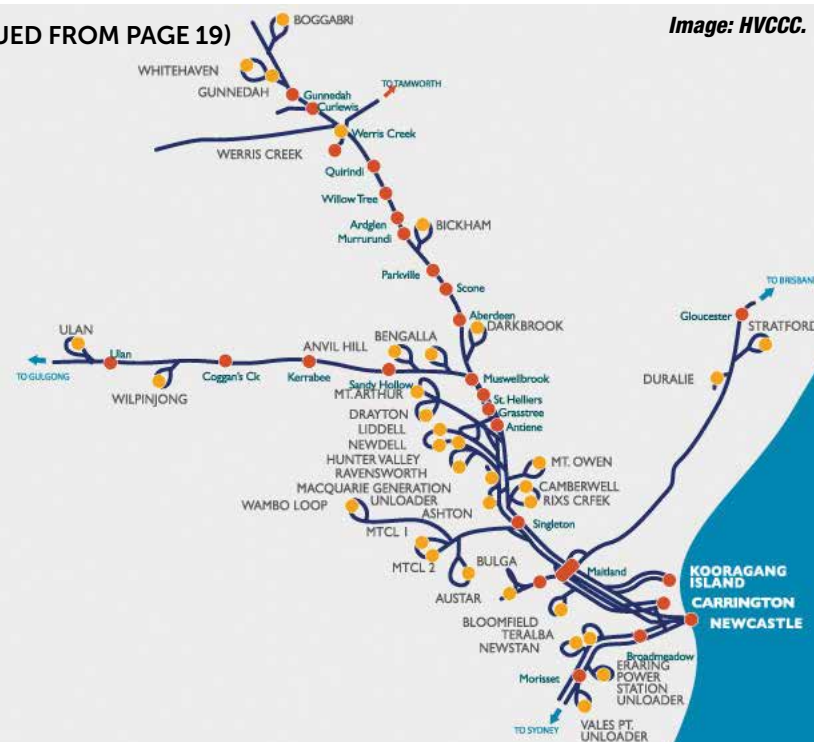
However in 2010, coinciding with the depression of the region's coal mining industry, construction of the \$1.65 billion Hunter Expressway project – a 40km dual carriageway that cut 28 minutes off travel time between Newcastle and the Hunter – had begun.

(CONTINUED OVER)



(CONTINUED FROM PAGE 19)

Image: HVCCC.



The Hunter Valley Coal Chain.

Cessnock Mayor Bob Pynsent said much of the Hunter was fairly lucky, with its newly unemployed workers able to side-skill into construction and associated trades for the expressway, which as a by-product had also opened up real estate in the region.

"Initially, tradespeople left their jobs to move into the more lucrative mining industry," Mayor Pynsent said.

"When there was a rationalisation of employment opportunities in the coal industry around 2010, those same people were able to leave mining industry and be absorbed into the boom in housing that flowed from the construction of the highway project."

### Resurgence

Since the start of 2016, the cyclical nature of mining has provided new opportunities in the coal industry, with better-than-expected thermal and coking coal prices driven by increased demand from Asian markets.

2016 export data from Coal Services revealed that global demand for NSW coal had reached record levels, with exports increasing by 1.5mt on the year before, defying predictions from some that coal would diminish as a key export.

The figures also revealed a record volume of 161mt of coal was exported through the Port of Newcastle that year.

Mr Galilee said demand for NSW coal

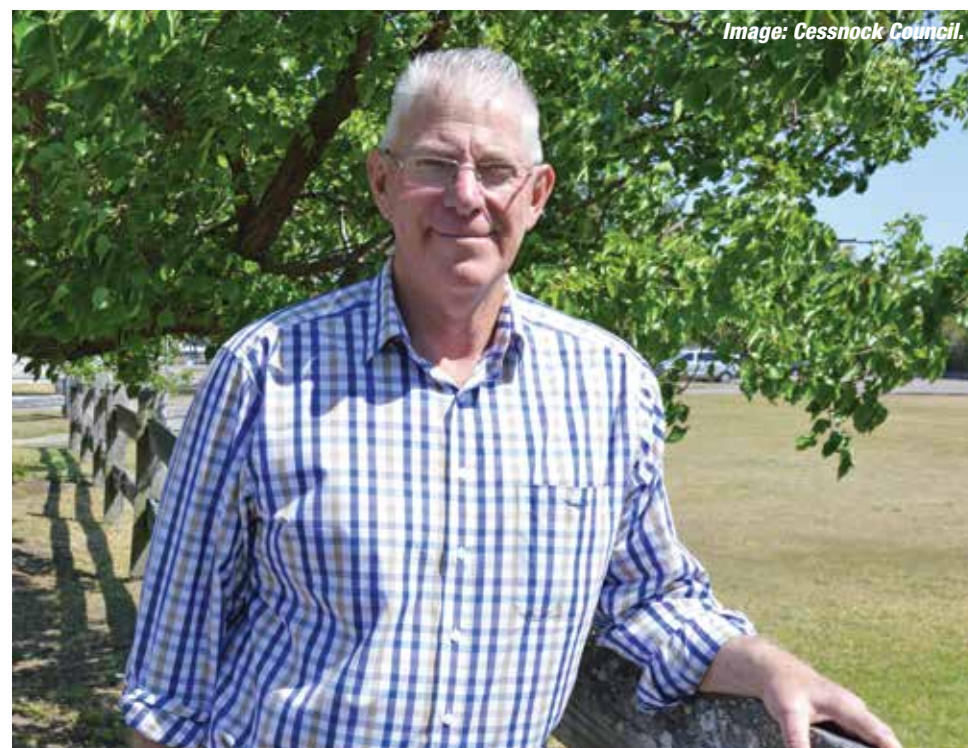


Image: Cessnock Council.

Cessnock Mayor Bob Pynsent.

would remain solid across its main export markets.

"Current figures from coal services suggest another strong year of demand for NSW coal year for 2017," he said.

"The International Energy Agency (IEA) recently released its *South East Asia Energy report*, which indicated that coal demand would increase in the region by near 4 per cent annually to 2040.

"Combined with declining Indonesian exports over the same period (from 290 metric tonnes carbon equivalent (mtce) in 2016 to 170mtce in 2040) the IEA expects Australia, including NSW with its high quality coal, will increase its exports by more than 15 per cent to 2040.

"This is good news for the NSW economy as coal and other minerals exports are our State's most valuable exports."

Mr Galilee said the Hunter would see positive affects across the spectrum.

"New figures from coal services show there were just over 20,600 coal production jobs in NSW as at July this year – over 1300 more than at the same time last year, and the highest since March 2015.

"Many of these new coal mining jobs are in the Hunter, with over 1000 more local coal mining jobs than a year earlier.

"It's good news for local communities and as well as for the more than 3600 local Hunter businesses that supply the mines."

## HOW CAN INDUSTRY AND GOVERNMENT WORK TOGETHER TO NURTURE A ROBUST MINING INDUSTRY?

A message from NSW Minerals Council chief executive Stephen Galilee.



CONTINUED strong demand from established markets in Japan, Taiwan and Korea, as well as China, along with significant growth across emerging markets in Southeast Asia demonstrate the significant economic opportunities for NSW, provided we get the policy settings right.

This includes an efficient planning approval system and a regulatory regime that does not become a significant burden to our industry. Since the current Government came to office in 2011 the NSW mining industry has had to prepare nearly 200 submissions on more

than 110 proposed regulatory or policy changes – over one a month. While some of these changes have been positive, many have involved additional compliance burdens and costs.

We've been working hard to secure improvements and relief for the industry, while maintaining the high standards of environmental protection the community expects. Importantly, we've worked to secure improvements in planning approval timeframes, including a commitment from the NSW Government to halve average planning assessment time frames for major mining projects by the end of its current term.

To the NSW Government's credit, this commitment appears to be on track. While there is still more to be done, if we can lock in policies that support NSW mining, we'll build on our industry's positive export figures, attract investment and create more jobs in our State.

## The smart way to improve your facility

www.megadoor.com



With its unlimited size and design flexibility, the Megadoor vertical lifting fabric door gives architects, engineers and operators complete freedom when designing, building or renovating mining doors.

Contact our team of professionals to discuss your project and how we can support your business.

john.boyle@assaabloy.com

MEGADOOR  
ASSA ABLOY

ASSA ABLOY,  
the global leader in  
door opening solutions



# Celebrating 45 years of success

GLOBAL tyre management leader Otraco has enjoyed more than four decades of success supplying tyre management services to the mining industry.

Founded in Australia in the 1970s, Otraco pioneered off-the-road (OTR) tyre management including tyre life analysis methodologies (such as fitment period batch analysis), tyre pressure and temperature monitoring systems (TPMS), as well as the industry's understanding of tyre explosion mechanisms.

Over the years, Otraco's work has been so widespread that even the tyre position numbering system, used almost universally, originated with Otraco.

Today Otraco is a wholly owned subsidiary of Downer.

Expanding beyond Australia, Otraco's first project in South Africa was with Anglo American's Mogalakwena, the largest platinum mine in the world.

With further expansion into the America's, Otraco now manages some 60 projects around the world with an enviable customer base including BHP, Rio Tinto, Anglo American, FMG, Glencore, Codelco, Newcrest, Yancoal and Peabody.

Commercially independent of any tyre manufacturer, supplier or repairer, Otraco prides itself on remaining at the cutting-edge of tyre management technology offering a leading internet-based tyre management and reporting system, Otracom.

In use across more than 65 mine sites worldwide, Otracom tracks and manages tyres and rims from manufacturing to disposal to identify performance trends



Otraco has had an established presence in the Hunter Valley for more than 10 years, securing its first contract in the region in 2006.

and reduce tyre-related costs.

Otracom enables users to rely on a centrally maintained management system that delivers consistent reporting

worldwide.

Otraco also offers OTR tyre training at its RTO (#51112) in WA where trainees are able to work on full-scale mining

equipment just 30 minutes from the centre of Perth.

More information can be found at: [www.otraco.com](http://www.otraco.com).



## World leader in Off-The-Road tyre management.

We help customers increase productivity and reduce tyre total cost of ownership. With a focus on safety and innovation, our people have the courage to challenge the status quo and deliver step change solutions to help customers succeed.

To find out how we can bring step change to your operations **call us today on 08 6274 7200.**

[www.otraco.com](http://www.otraco.com)  
[www.downergroup.com](http://www.downergroup.com)





# Safe and reliable staffing solutions



PSW is a proud service provider in the Hunter Valley.

PROGRAMMED Skilled Workforce (PSW) has provided skilled and safety focused workforces to the mining industry in the Hunter Valley since 1994.

The company was also the first service provider in the industry to be AS/NZS 4801 certified.

Programmed currently manages 1100

personnel, including 550 trainees and apprentices, across major mining sites in the Hunter Valley, working in disciplines such as operational, trades, professional/technical, administrative and stores personnel.

A continual investment in its people and systems has ensured Programmed provides

the safest possible staffing solutions to its mining customers.

"Working for Programmed, jobseekers can feel reassured by our commitment to safety and to our employees returning home in the same condition they arrived – without injury," PSW regional general manager Scott Hennessy said.

"Likewise, for our customers, safer people means that they achieve their key safety and production objectives.

"This is especially crucial in the mining industry and we are proud of our safety performance to date."

More information can be found by visiting [www.programmed.com.au](http://www.programmed.com.au).

 **PROGRAMMED**  
Skilled Workforce



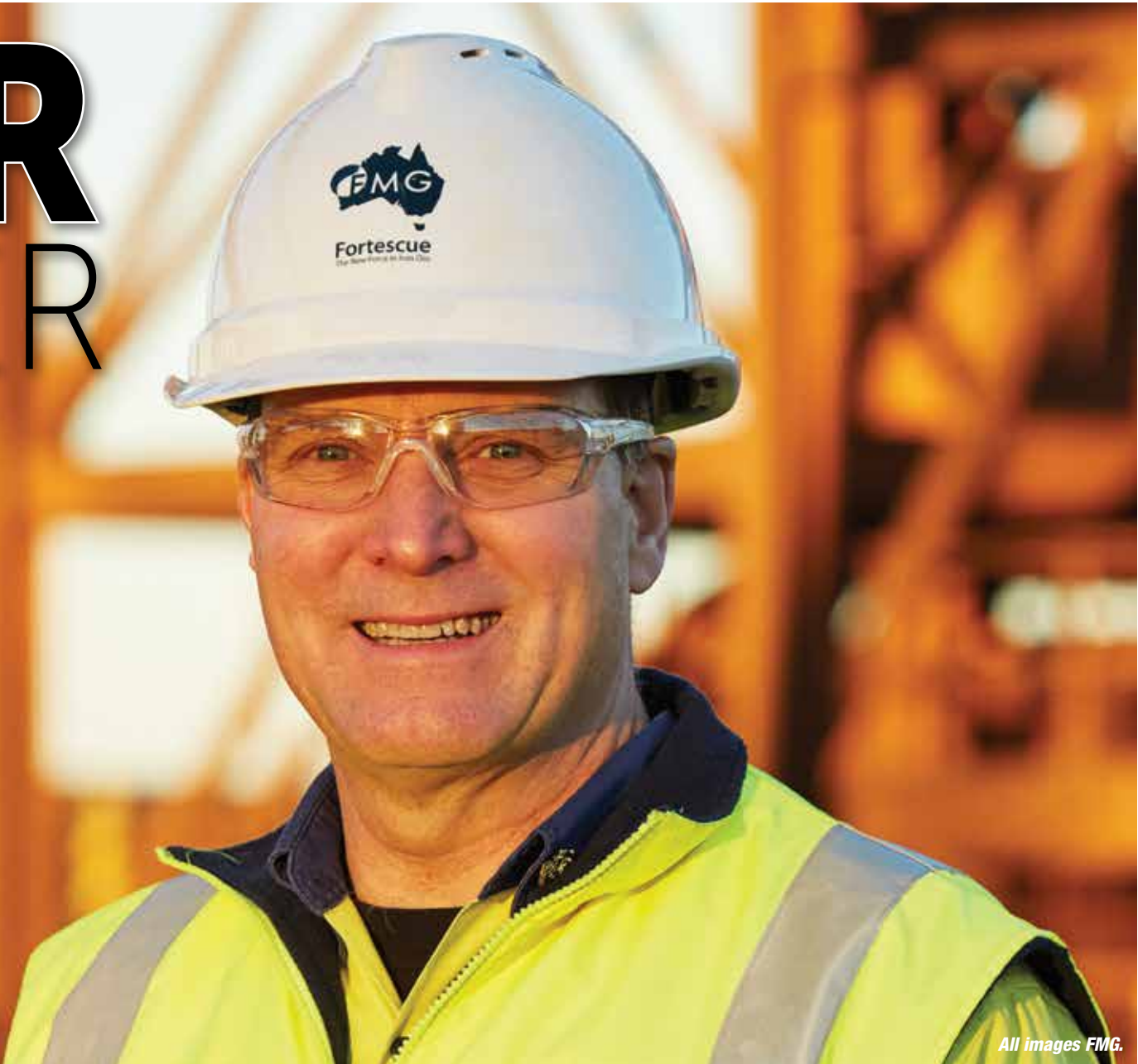
**Proudly supporting the mining industry in the Hunter Valley with skilled and safety focused workforces since 1994**

**zero/harm**  
[programmed.com.au](http://programmed.com.au)



# STAR POWER

Seasoned executive Nev Power reflects on his time at FMG and the company's next chapter, as it embarks on the \$US1.5 billion Eliwana project and examines diversification beyond iron ore.



All images FMG.

ELIZABETH FABRI

REWIND the clock four or five years and it's hard to believe FMG is the same company that stands here today.

In 2012/13, the miner was staring death in the face, drowning in a \$US13 billion pool of debt just as the iron ore price was continuing its slow decline to late-2015 lows of \$US38/t.

Many outsiders feared the worst, but even during the company's darkest hour FMG chief executive Nev Power remained assured of a recovery.

"It's been an absolute privilege and an honour to [serve] FMG for the whole time," Mr Power told *The Australian Mining Review*.

"We've had some challenges, but I think the most rewarding and the most defining moments have been seeing how well the Fortescue team rallied behind the challenges that we have had.

"Though there was no shortage of times when we knew we would need to dig deep to make sure that we achieved what we wanted to, I was always confident that we would be able to meet those challenges.

"While it wasn't always obvious publically, in many cases – certainly around the balance sheet and debt restructure – we always had a number of options."

Mr Power joined FMG in February 2011 as chief operating officer before being promoted to chief executive as Andrew Forrest's successor in July the same year.

His robust and collaborative leadership style, some quality decision making, and a dash of luck (brought on by the iron ore price recovery in 2016), were the key catalysts that helped navigate the company out of the danger zone and towards prosperity.

Today, FMG is the world's fourth largest iron ore producer (and proud holder of a number of prestigious industry accolades)

## Q3 2017 HIGHLIGHTS

- 44 million tonnes of iron ore shipped
- Cash production costs (C1) of \$US12.15 per wet metric tonne: a 10 per cent improvement year-on-year
- Cash on hand increased to \$US2.3 billion
- Gross debt of \$US4.4 billion

after quadrupling annual production to 170 million tonnes (mt), and reducing costs by more than two-thirds to become the lowest cost seaborne supplier of iron ore into China.

FMG has also been in a position to make early repayments to significantly reduce the amount of interest incurred on its debt.

Many hard decisions were made over his tenure; Mr Power said what was ultimately put in place "was the best of those options".

"We made decisions in a very collaborative way," he said.

"The whole organisation [was] involved in deciding what we needed to do; everything from our marketing strategy right through to our finance strategy.

"All of those have been very successfully implemented.

"Some of the key [decisions] has been the focus on productivity and efficiency across the business to reduce our C1 costs, and to achieve the cost result where we are now the lowest cost iron ore producer in the world.

"I think that has been an outstanding result."

Naming a successor

In September, chairman Andrew Forrest announced Mr Power would step down from the role in February next year for some "well deserved" time off.

"Nev has executed his duties to the highest degree and met or exceeded the often unreasonable standards set by his Board," Mr Forrest said.

"We could not be more pleased with his stewardship and respect his decision that it is time for the next chapter of Fortescue to begin.

"This is consistent with our long term succession plan and we both share great confidence in the quality of internal and external candidates to continue Fortescue's legacy."

The industry echoed Mr Forrest's view, awarding Mr Power the *2017 Mines and Money Legend in Mining* award at the International Mining and Resources Conference (IMARC) in November.

It is clear that Mr Power's replacement will have some big shoes to fill.

While the verdict is still out on the board's decision, all eyes are on FMG's newly appointed director operations Greg Lilleyman as the presumed successor.

Mr Lilleyman joined FMG in January after spending 25 years at Rio Tinto, most recently as head of innovation and technology.

Speaking on the side lines of the Committee for Economic Development of Australia (CEDA) WA Annual Resources Overview lunch in Perth late October, Mr Lilleyman said this was ultimately a decision for the board.

Another possible internal option is FMG's chief financial officer Elizabeth Gaines, who joined the FMG executive team in February, after serving on the board since 2013.

Mr Power said the board would make an announcement "as soon as they are able".

Media speculation is that a decision will be made before the Christmas period to allow for sufficient handover time before Mr Power's last day on 16 February 2018.

The next phase

At the company's Annual General Meeting (AGM) on 8 November, FMG announced it had chosen its \$US1.5 billion Eliwana project, 90km from Tom Price, as the immediate replacement for its depleting Firetail mine.

The FMG board was faced with two options; extending the rail line from its Solomon Hub project 130km west to the Eliwana deposit, or develop a new operation at Nyidinghu about 40km south of its Chichester Hub to the east.

Mr Power said the 30mtpa Eliwana project offered more product options, better capital and operating costs and quicker timeline to market.

"There's 2.1 billion tonnes of resource already identified there [Eliwana], it's highly prospective and has great grades," Mr Power said at the AGM.

(CONTINUED OVER)



(CONTINUED FROM PAGE 23)



**“While it wasn’t always obvious publically, in many cases – certainly around the balance sheet and debt restructure – we always had a number of options.”**

“Of course, Nyidingu remains a very significant ore body for future development and this just means that, in timing, the Eliwana Western Hub project will come before Nyidingu.”

Approval processes, including mine and rail infrastructure for the Eliwana project have now begun, and timing on the commencement of operations will be made at the completion of a feasibility study, expected late FY18.

Over the course of the year, feasibility studies and development options for the Iron Bridge Magnetite project will also continue to be evaluated, with a decision expected to be made with FMG’s joint venture partners soon.

FMG will also be adding more autonomous trucks to its fleet in FY18 as part of its strategy to improve productivity.

The innovation push included converting up to 12 793F trucks to autonomous haulage technology (AHS) at Solomon Hub, the rollout of AHS across the Chichester Hub project, a relocatable overland conveyor trial at Cloudbreak mine, and IT network upgrades at Cloudbreak and Christmas Creek.

### Diversification

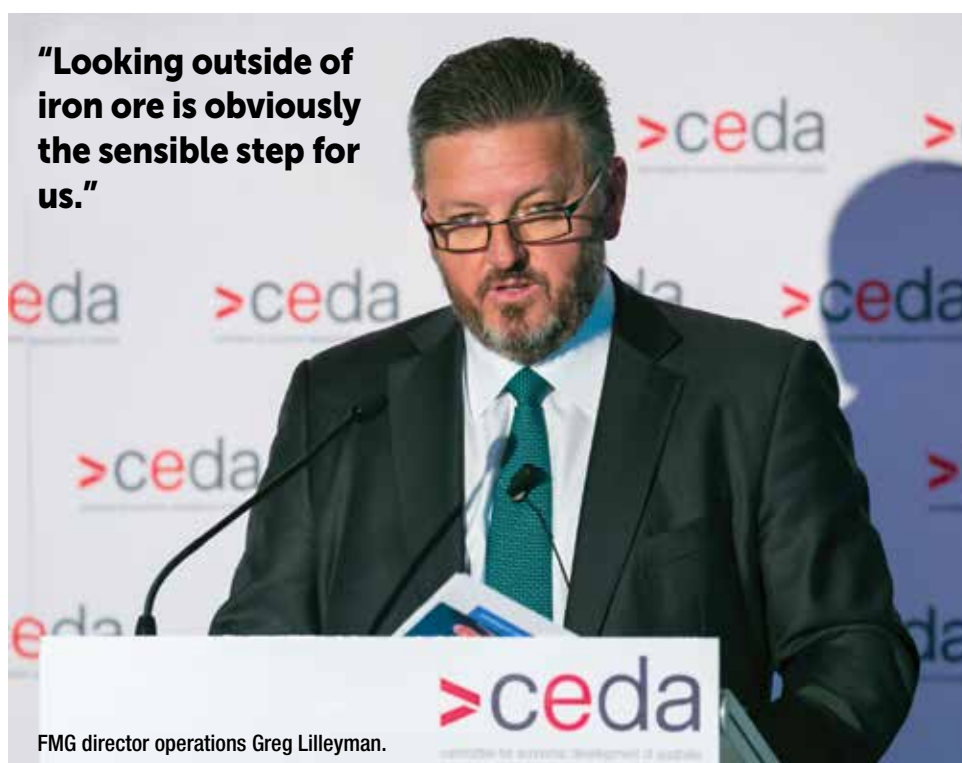
Beyond its iron ore developments, FMG was also dipping its toes in a number of early-stage exploration options in the hunt for other commodities such as gold, lithium and copper.

Mr Power said the company was not specifically chasing one commodity over another, but rather interested in seeing how they could apply the skills and capabilities developed in its iron ore business to new areas.

“Our diversification strategy is driven by value creation so we’re not diversification for the sake of diversification or growth, but rather on where we can create value,” Mr Power said.

“We have been opportunistic in

**“Looking outside of iron ore is obviously the sensible step for us.”**



FMG director operations Greg Lilleyman.

securing respective tenements in different commodities; some in the Pilbara, some outside the Pilbara, and we’re doing grassroots exploration or early stage farm-ins to see what we can find on those properties.”

The tenements included early stage exploration areas in the Pilbara, South Australia and NSW, and highly prospective areas of Ecuador where FMG holds 32 exploration tenements.

There was recent speculation the miner was looking increase its footprint in the Fraser Range, WA.

Mr Lilleyman said the company was “starting to take small bets” into exploration to see what opportunities were out there.

“I wouldn’t be sitting here saying we are pushing very hard in those areas, we’re certainly starting to make small investments to start to create some small

opportunities,” he said.

“I think naturally for us, in the iron ore sector demand has been growing so strongly on the back of China’s development that there’s naturally a bit of plateauing in iron ore demand.

“If we want to grow our company the options within iron ore are quite limited other than holding our own or improving our own performance to generate more value.

“Looking outside of iron ore is obviously the sensible step for us.”

### Market outlook

Mr Power said one of the biggest issues facing its iron ore shipments at present was Beijing’s winter curtailment policy.

“It is already having very significant impact,” Mr Power said.

“I think its caught all the market by surprise as to how quickly those restrictions were put in place and it makes it a little bit hard to predict going forward, but at this stage there are a number of things happening.

“There’s a lot of steel production that will be increased outside of that area to compensate and steel mills within that area are doing a lot of work to reduce their emissions, so in the future they won’t need to restrict production to reduce airborne emissions overall.”

As a result of the policy, the Chinese steel industry was paying premiums for higher quality ore as part of government measures to reduce emissions; which has had an impact on FMG’s earnings for its lower grade ore.

FMG said it has had to lower its iron ore price realisation guidance to between 70 and 75 per cent of the benchmark high-grade iron ore index due to wide price discounts between high-grade and low-grade ore.

“The question remains going forward is to how deep those production restrictions are going to bite,” Mr Power said.

“This could be largely dependent on weather conditions as well, so it’s very hard to predict so it’s a matter of waiting and seeing.

“Having said that, the important thing from our perspective is focussing on the things that we can control.

“Our business is generating very strong cash returns, even where this market is today, so there is a lot of upside potential for us once these restrictions are lifted.”

As the wide price discounts continue, FMG said it was looking to expand into new markets in Europe and Asia to generate value, for example the UK, Germany, Southeast Asia and India.

“Investing in the long-term sustainability of our core iron ore business, maintaining production, further strengthening the balance sheet and generating shareholder returns remain our key priorities,” Mr Power said.





The bad run has ended for the cities of the Upper Spencer Gulf, who can finally catch their collective breath as new regional investments signal hope.

GFG Alliance. Photography: Sean Kelly.

ELIZABETH FABRI

TWELVE months ago the Upper Spencer Gulf cities of Whyalla, Port Augusta, and Port Pirie in South Australia were existing in a state of uncertainty.

In Whyalla, the sale of Arrium’s assets remained up in the air; dire times for a community which had been impacted by almost 1000 job losses leading up to Arrium entering administration.

If Arrium failed to secure a new buyer, many believed Whyalla and – to a lesser extent – the State of South Australia would fall into economic and social crisis.

“We had never been in a situation where [the Whyalla steelworks] went into administration and owed \$4 billion,” City of Whyalla mayor Lyn Breuer said.

“That was such a gut cruncher for the community because while we had issues before when the shipyard closed back in 1970s, this was the really big one. I could not see us being able to get out this of easily.

“Community morale went right down, community confidence and spending went right down; people were very nervous.”

Sentiment was similar in Port Augusta, which was struggling to fill the economic void left by the closures of Alinta Energy’s Leigh creek coal mine and coal-fired power station, while things were better in Port Pirie with Nyrstar’s 127-year-old smelter at the tail end of a massive \$600 million redevelopment.

Flash forward to the second half of 2017 and things were beginning to look up for the Upper Spencer Gulf, with a run of good news renewing confidence in the region.

A huge turning point was the July sale of Arrium to GFG Alliance, led by Gupta Family Group executive chairman Sanjeev Gupta, which ended 15 months of uncertainty for the people of Whyalla and supply chain businesses in the area.

“I don’t think we could have asked for a better result,” Ms Breuer said.

“Certainly the State Government has been very important to Whyalla over the last 18 months, and very important to the sale process of Arrium [through its \$50 million contribution to support the new owner].

“I feel very confident about GFG Alliance and their role in all of this, very confident about his [Sanjeev Gupta’s] attitude, not to just the plant itself but to steel making and our community.

“He’s prepared to get involved in



“We’ve always had a little bit of rivalry between the three cities, but we’ve basically put that aside now and decided we need to work together – we need to complement each other.”

GFG Alliance. Photography: Sean Kelly.

our community, to put money into our community, as well as the rebirth of the steel plant.”

On 28 September, Nyrstar announced that hot commissioning of the Port Pirie redevelopment had commenced, which was followed by the first feed of the TSL furnace in October.

The region also had a number of high profile mining developments underway.

The massive \$4.5 billion Central Eyre Iron Project received State Government approval in May and, if developed, will employ up to 2000 people during construction and 700 once operational.

OZ Minerals’ gave the green light to its \$916 million Carrapateena mine, north of Port Augusta, in August, while BHP has pledged to support Upper Spencer Gulf businesses as its FY17 \$600 million investment into its Olympic Dam mine ramps up.

In addition, there were a number of graphite mines planned for the region.

Lincoln Minerals hopes to begin development at Kookaburra Gully in the 2018-19 financial year, and Renascor Resources is pushing hard to get its tier 1 asset Siviour up and running.

Then there’s the strong renewable energy push; in August, the State Government announced a new \$650 million solar thermal power station in Port Augusta to help fill the energy void.

Due for completion in 2020, the

Government estimated 700 jobs during construction and 50 ongoing positions.

In late October, GFG Alliance’s Mr Gupta also made some big energy announcements.

GFG Alliance subsidiary ZEN Energy would build 1 gigawatt (1000 megawatt) of dispatchable renewables in and around Whyalla, 100MW/100MWh battery storage facility at Port Augusta, 100MW of demand response at the Whyalla steel works and other sites, and a 120MW/600MWh pumped hydro storage facility at a disused iron ore mine pit in the Middleback Ranges.

Mr Gupta also promised an additional 480MW of solar capacity in due course.

A region in transition

Through the Upper Spencer Gulf’s shared struggles, Ms Breuer said the cities had put rivalries aside and now worked together more closely.

“All three communities have been in crisis in the last couple of years,” Ms Breuer said.

“Out of trauma and tragedy comes a stronger working relationship.

“We’ve always had a little bit of rivalry between the three cities, but we’ve basically put that aside now and decided we need to work together – we need to complement each other.

“We communicate almost daily about what’s happening in our areas, and while

there will still always be an element of competition, there’s plenty of room for all three of us.”

This partnership between cities was cemented at the annual Sustainable Economic Growth for Regional Australia’ (SEGRA) national conference in October, held in the Upper Spencer Gulf for the first time in the conference’s 20-year history.

“I was thrilled to bits to have so many delegates from all over Australia say to us ‘you are a model for the rest of Australia of communities strengthening their numbers by working together and actually being successful in what you’re doing,’ Ms Breuer said.

“A whole range of new industries are starting to look into coming to our area.”

According to the Upper Spencer Gulf Common Purpose Group, an alliance between the three local Governments, one of the region’s biggest challenges in the past had been its reliance on single industries dependent on global influences.

Metal mining and processing had been a key pillar supporting the region since its inception, but the group remained confident this will change over time as the region diversified into new industries.

“Basically in the past we have been engineering and mining,” Ms Breuer said.

“We now are broadening; we are broadening into the health areas, into education, the renewable energy area, and defence is a huge item for us at the moment.

(CONTINUED OVER)



**New Australian high grade graphite mine by 2019**

- World-class Kookaburra Gully
- Premium flake graphite quality
- In Global Top 10 - 15.2% TGC
- Located SA's Eyre Peninsula
- 100%-owned by Lincoln
- Nearby mineable deposits
- Further exploration upside
- Mining lease granted
- PEPR lodged with SA Govt
- Pilot plant tests in China
- Customer tests underway
- Construction start 2018
- Low capital cost <A\$50m
- 35,000tpa concentrate output
- Global market opportunities

**Kookaburra Gully Graphite Deposit**  
2.03 Mt @ 15.2% TGC (Measured, Indicated & Inferred)

**ML 6460**

**LINCOLN MINERALS**

www.lincolnminerals.com.au  
28 Greenhill Road WAYVILLE SA

(CONTINUED FROM PAGE 25)



GFG Alliance. Photography: Sean Kelly.

"We have got an area of land between Port Augusta and Whyalla that has been taken over by the defence forces and they are doing all of their training exercises in our area now."

The renewable energy industry was also a big ticket item for the region's growth, with Whyalla now undertaking a lot of the work for the towers and turbines for wind farms.

"We've also got a company that is interested in moving to Whyalla to set up a helicopter training school which is going to be quite amazing for us in the future if that gets off the ground," she said.

"And then there's a whole lot of other companies — transport companies for example — that are moving in.

"In the last three months since the Arrium announcement, we've started to get a whole lot more companies that are talking to us again with a view of setting up in our region. All three cities have noticed this."

Yet mining remained a key pillar.

Ms Breuer said a substantial amount of money was currently being invested in the region, particularly in prospecting and the development of new projects.

"At the recent Upper Spencer Gulf Global Maintenance Conference there were a number of new mining projects discussed," she said.

"It was really quite exciting because even if only half of them get off the ground there's jobs and services for our region."

#### Building a national hub

While confidence was returning to the region, the three cities still recorded a below average number of technical, scientific and professional and business services enterprises.



Whyalla Mayor Lyn Breuer.

According to the local Government alliance, building local capacity in these areas was vital to promote growth for a more diversified economy.

Ms Breuer said given the Gulf's proximity to South Australia's prospective mining projects, the region was ideally located to become a hub for innovation, applied research, skills and training for the mining sector.

Developing the region as a heavy industry hub was also high on the agenda.

"The three Spencer Gulf cities have a fairly common heritage in that we all have a fairly strong engineering background," Ms Breuer said.

"With this common heritage, we have common skills across the three cities and are able to use them for development of

future projects."

Ms Breuer said there had also been a lot of discussion about investing in transport infrastructure to reposition the region as a national transport and logistics hub.

At present, the Port Pirie and Whyalla ports were both underutilised, with the region seeking greater access and use of these facilities.

"There's been a lot of discussion about this and working close with State and Federal Government on this," she said.

**"In the last three months since the Arrium announcement, we've started to get a whole lot more companies that are talking to us again with a view of setting up in our region. All three cities have noticed this."**

"The isolation of our region is one of our biggest problems, we are a long way from anywhere, so those back up services there and a good transport system will certainly make it more attractive for the companies coming in, particularly for the transport of goods and services and workers.

Ms Breuer said she was proud of the region and the recognition it received at the SEGRA conference.

"We know that we are making things happen in our region, and look forward to a confident future for our children and grandchildren," she said.



# Aquest completes work at Arrium IPF

AQUEST Electrical was recently contracted to help complete the iron ore integrated processing facility (IPF) at Arrium's Iron Knob and Iron Baron projects in South Australia.

The IPF is critical to the mining and steelmaking processes, with the objective of improving the quality by refining the ore to raise the Fe content and fetch higher prices.

Aquest provided services throughout the entire project, right down to mobilising and demobilising all site offices and workshops.

This work included the installation of 33KV transformers for the plant and process water demands; and all electrical cabling, variable frequency drives and field devices for the conveyors, screens and pumps.

Aquest also completed upgrading switchrooms and VF drives for pump stations, as well as optic fibre installations, terminations, repairs with full testing and certification.

The IPF was integrated with existing plant efficiently, and without costly delays to production.

For more than 10 years Aquest Electrical has delivered quality technical electrical, communication and refrigeration solutions to its clients across the resources and heavy industry sectors in Australia.

The company provides its clients with remote location maintenance crews and long term operational support for fabrication, installation, removal, repair and refurbishment at mobile and fixed plant facilities.



Aquest has completed electrical work at major projects across Australia.

## QUALITY DELIVERED MINING | ENERGY | HEAVY INDUSTRY

10+ years of quality delivered technical electrical, communication and refrigeration solutions to clients across the mining, energy, and heavy industry sectors throughout regional and remote Australia.



### WHAT WE OFFER

- Shutdown/Outage planning and Project Management
- Electrical Construction
- Technical fault finding and diagnostic
- Preventative, predictive and routine maintenance
- Inspection, testing and reporting
- Specialised communication system installation, repair and maintenance, CCTV for Process Monitoring
- Remote location maintenance crews
- Relief plant operator maintainers

### WHAT WE DO

- Mobile and fixed plant repair, refurbishment and maintenance
- Thermography inspections and preventative maintenance reports
- Hazardous area installation and maintenance & Certification.
- HV Installation, Terminations & Switching
- Mobile and fixed operation power installation and maintenance
- Communications, data and telecommunications including fibre
- Mobile, fixed and base station radio programming, repair and installation
- Energy saving solutions
- Power quality analysis
- Off grid power solutions



[www.aquest.com.au](http://www.aquest.com.au)  
[service@aquest.com.au](mailto:service@aquest.com.au)  
p: 08 8644 2244



# Year-round equipment hire

ESTABLISHED in 2008, CBCH Crane Hire is a local company owned and operated out of Whyalla, South Australia.

The staff pride themselves on providing all their clients with professional, reliable service with the hire of equipment, as well as facets of mining, shutdowns, construction and general crane hire.

"We employ local, and our team is very hands on and close knit," CBCH director Chris Birch said.

"Our operators and ground staff are experienced riggers and dogmen, and many have industrial qualifications and trades, which allows more versatility."

CBCH Crane Hire has vast experience in the mining and resources industry and has been involved in major contracts in Whyalla, such as the Arrium Port Expansion facility, Crushing Facility-Iron Barron, Whyalla Public Hospital upgrade, Leighton Rail Loop project and the Dolphin upgrade at Santos.

"At CBCH Crane Hire, we recognise that safety is a crucial element to our business, and we are constantly striving for zero harm in our workplaces through regular training and servicing of our equipment," Mr Birch said.

More information can be found at: [www.cbch.com.au](http://www.cbch.com.au).



CBCH Crane Hire has vast experience servicing the resources industry in the Upper Spencer Gulf region.

## EQUIPMENT HIRE FOR YOUR NEXT PROJECT

CBCH is a Whyalla owned and operated 24/7 Crane Hire company employing local people since 2008.

No matter your project needs, big or small, we offer all the essential equipment for hire and pride ourselves on providing all our clients with professional, reliable service with the hire of our equipment.

Our Crane Operators and Riggers are all trained and experienced in the job.

Our Fleet consist of:

• 15T Franna • 20T Franna x 2 • 25T Franna • 50T Kato • 55T Liebherr • 100T all terrain Liebherr • Rigid Flatbed 8T • 45T Drop Deck with ramps



ISO 9001:2015 – Quality Management Systems

ISO 14001:2015 – Environmental Management Systems

AS/NZ 4801:2001 – Occupational Health & Safety Management Systems

### CONTACT US TODAY:

DIRECTOR/OWNER

Chris Birch

0419828896

[chris@cbch.com.au](mailto:chris@cbch.com.au)

OFFICE MANAGER

Tanya Felice

0428345346

08 86441119 – Office

[tanya@cbch.com.au](mailto:tanya@cbch.com.au)

**CBCH**  
CRANE HIRE  
Ph. (08) 8644 1119  
*Whyalla Owned And Operated*  
[cbch.com.au](http://cbch.com.au)



# A strong SA presence

IT'S been a rough couple of years for Australian construction contractors, but a market leader in marine infrastructure services, Maritime Constructions, has ridden the storm.

Thanks to a few tweaks such as branching out overseas, cutting costs and becoming a major EPC (engineering, procurement and construction) contractor, the award-winning Port Adelaide-based business is booming.

Its main divisions are Maritime Constructions, which does major projects, Dredging and Port Development, and Harbours and Marine making up the Maritime group.

"We're coming out of a big recession as far as South and Western Australia are concerned," Maritime Constructions chief executive Shane Fiedler said.

"The last 24 months have been pretty bad for contractors and the fact we're still here is testimony to us reacting to the market conditions.

"We adjusted across the business to and ride out the storm."

Recent contracts included the construction of the first stage of the recently opened Onslow Marine Support Base in WA, the design and construction of a timber export facility at Kangaroo Island, South Australia, and a refurbishment of a timber jetty at Port Victoria, South



Maritime Constructions owns and operates a versatile fleet of floating plant and equipment.

Australia.

"We have long-term dredging contracts, and long-term construction contracts with the SA State Government maintaining

jetties and harbours," Mr Fiedler said.

"Thankfully the last 12 months – the last six months especially – have been fantastic.

"We're looking positive in terms of

Australia."

The company has a strong foothold in the Upper Spencer Gulf and is looking forward to new opportunities in the region.

## MARINE INFRASTRUCTURE SPECIALISTS

Our demonstrated capabilities include:

- \* **Design and Construction**
  - o Commercial and Recreational Jetties and Wharves
  - o Marine Supply Base and Cargo Load-out Facilities
  - o Marine Intake and Outfall Pipelines
  - o Aids to Navigation and Fender Systems
  - o Breakwaters and Rock Walls
- \* **Capital and Maintenance Dredging**
- \* **Asset Management and Maintenance**

We own and operate a versatile fleet of floating plant and equipment maintained to the highest standard. With in-house engineering, mechanical and fabrication capacities we easily adapt to meet changing project requirements



**MARITIME  
CONSTRUCTIONS**

110 Lipson Street, Port Adelaide SA  
info@mc-group.com.au  
(08) 8248 8700  
www.maritimeconstructions.com.au



MAX

SPECIALIST LIFTING  
EQUIPMENT HIRE  
TRANSPORT



CAN-DO  
CAPABILITY



Max Cranes has been supporting the mining and resources, oil and gas, power and energy (including wind), transport and infrastructure and heavy industrial sectors for more than 13 years. Our remote working expertise is up there with the best in the country, and is supported by our major operational depots in Port Augusta, Whyalla, Port Pirie, Moomba and Adelaide, South Australia.

## OUR APPROACH

- The right people in the right place
- A modern fleet of all-terrain cranes ranging from 15T to 500T and transport equipment
- State of the art fleet maintenance and management
- Safety and quality demonstrated through international-level certification
- Streamlined operations through equipment planning system software

## OUR SERVICES INCLUDE:

- Specialist Lifting
- Crane and Heavy Haulage Equipment Hire
- EWP and Access equipment
- Transport
- Servicing and Maintenance
- Site Inspections
- Job Safety Analysis
- Equipment Monitoring
- Engineering and Drafting
- Project Management

## EQUIPMENT PROFILE

### Specialist lifting

FRANNA	15-25 TONNE ARTICULATED CRANE
TIDD PC25	25 TONNE ARTICULATED CRANE
TADANO GR250-N-1	25 TONNE ROUGH TERRAIN CRANE
TADANO TR500E-2	50 TONNE ROUGH TERRAIN CRANE
LIEBHERR LTM 1055-2	55 TONNE ALL-TERRAIN CRANE
TADANO GT-600EX	60 TONNE TRUCK MOUNT CRANE
LIEBHERR LTM 1070-4.2	70 TONNE ALL-TERRAIN CRANE
GROVE GMK 4080-1	80 TONNE ALL-TERRAIN CRANE
LIEBHERR LTM 1090-2	90 TONNE ALL-TERRAIN CRANE
GROVE GMK 5100	100 TONNE ALL-TERRAIN CRANE
LIEBHERR LTM 1130-5.1	130 TONNE ALL-TERRAIN CRANE
TADANO FAUN ATF 103G-5	130 TONNE ALL-TERRAIN CRANE
GROVE GMK 5180	180 TONNE ALL-TERRAIN CRANE
LIEBHERR LTM 1250-1	250 TONNE ALL-TERRAIN CRANE
LIEBHERR LTM 1400-7.1	400 TONNE ALL-TERRAIN CRANE
TEREX DEMAG AC500-2	500 TONNE ALL-TERRAIN CRANE

### Equipment Hire

ELECTRIC SCISSOR LIFT	14FT-40FT
ALL-TERRAIN DIESEL SCISSOR LIFT	26FT-53FT
ARTICULATING BOOM	34FT-135FT
DIESEL TELESCOPIC BOOM	85FT-135FT
GENERATORS	20KVA-1375KVA

### Transport

PRIME MOVERS	BOGIE DRIVE AND SINGLE DRIVE
SEMI-TRAILERS AND ROAD TRAINS	DROP-DECK FLOATS, FLAT BED, AND DECK WIDENING LOW-LOADER TRAILERS
TILT TRAY	ISUZU TILT TRAY
RIGGING TRUCK	ISUZU AND HINO

## Sectors

Oil & Gas

Mining & Resources

Power & Energy

Transport & Infrastructure

Heavy Industrial

## Services

Specialist Lifting

Crane & Heavy Haulage Equipment Hire

Transport

Servicing & Maintenance

Site Inspections

Job Safety Analysis

Equipment Monitoring

Engineering

Drafting

Project Management

- Initial investigations and lifting studies
- Site analysis, onsite supervision and management
- Large plant shuts

### HEAD OFFICE PORT AUGUSTA

Lot 6, Main North Road Port Augusta  
South Australia 5700 / PO Box 2086  
P: 08 8641 3955 • F: 08 8641 3977  
E: admin@maxcranes.com.au

### WHYALLA DEPOT

Lot 132, Mulconray Road Whyalla  
South Australia 5600  
P: 08 8644 3142 • F: 08 8641 3977

### PORT PIRIE DEPOT

Lot 371 Warner Town Road, Port Pirie  
South Australia 5540  
P: 08 8633 3128 • M: 0438 259 124  
E: steve.williams@maxcranes.com.au

### MOOMBA DEPOT

Lot 5A, Browns Road Moomba  
South Australia 5710  
P: 0447 602 829 • F: 08 8641 3977  
E: supervisor2@maxcranes.com.au

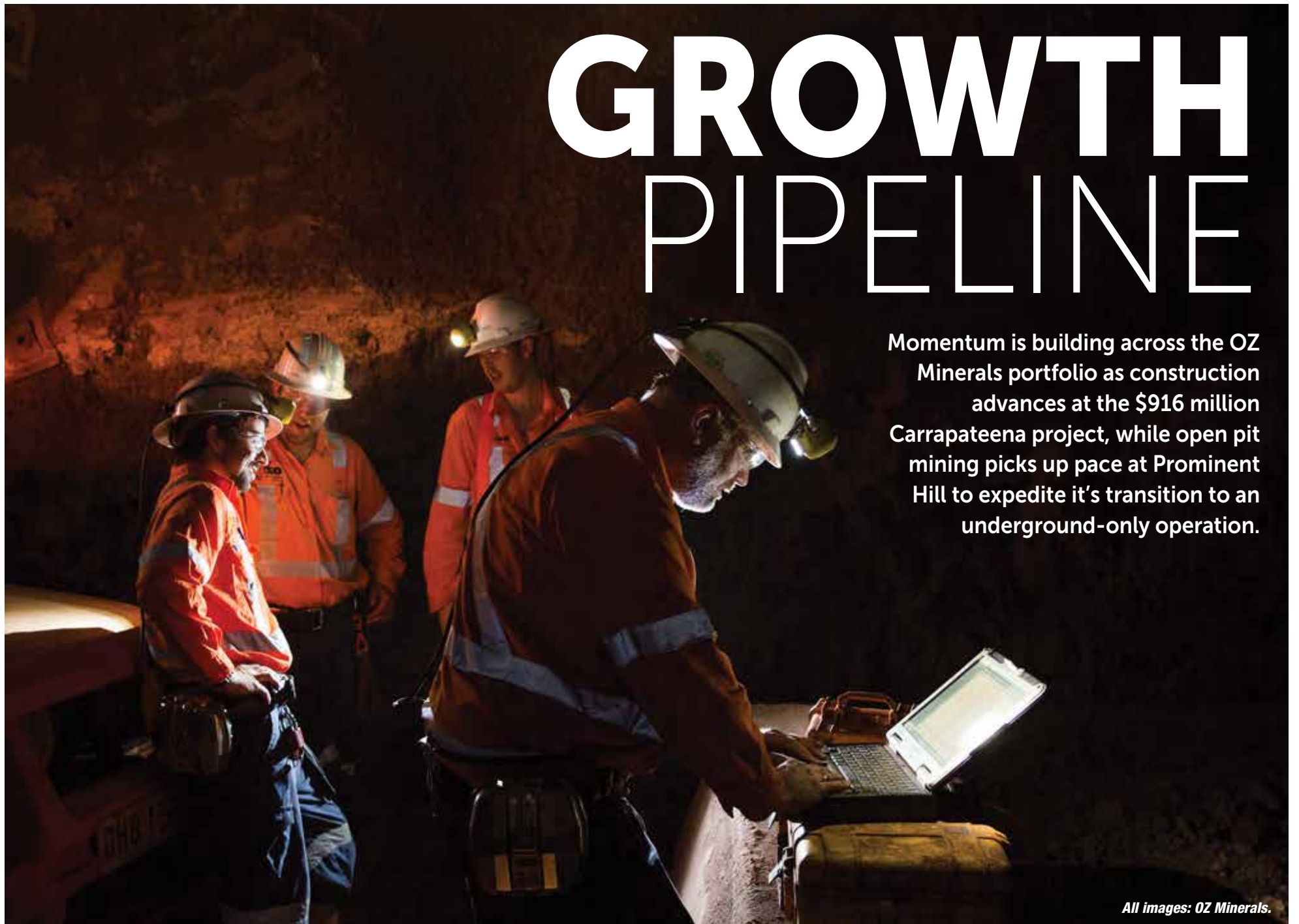
### ADELAIDE OFFICE

22 Cavan Road Dry Creek  
South Australia 5094  
P: 08 8359 7353 • F: 08 8641 3977



# GROWTH PIPELINE

Momentum is building across the OZ Minerals portfolio as construction advances at the \$916 million Carrapateena project, while open pit mining picks up pace at Prominent Hill to expedite its transition to an underground-only operation.



All images: OZ Minerals.

## ELIZABETH FABRI

IN August, the OZ Minerals board green lit the development of its Carrapateena copper-gold project, 160km north of Port Augusta.

The decision to develop the project was a defining moment for OZ Minerals as it gears up to become a low cost, multi-asset copper producer.

The miner's one operating mine Prominent Hill is a lucrative asset that produces more than 100,000 tonnes (t) of copper a year; but OZ Minerals is about to take the next step.

Scheduled to begin commissioning in the fourth quarter of 2019 – in line with projected rising copper demand – Carrapateena will have an annual output of 65,000t of copper and 69,000 ounces (oz) of gold over a 20 year mine life.

The mine will be constructed over two stages, with the first phase of development almost complete.

"The Carrapateena project has seen considerable progress with key contracts finalised and orders placed for long lead items associated with the process plant," OZ Minerals managing director and chief executive Andrew Cole said.

"Decline development is on plan with the second decline breaking through to the box cut, providing the primary ventilation circuit and greatly enhancing access and egress.

"We are now in the Woomera Shale and have developed an efficient cycle of blast, bog, rapid shotcrete and support to maintain a steady pace.

"Decline development now totals 3017 metres."

Mr Cole said a two-pronged approach to

**"In a nutshell, if you compare Carrapateena to other projects [globally] it has got to be one of the strongest copper developments in the world."**

construction lowered on-site construction personnel and reduced the size of the camp by 30 per cent.

"By doing it in two phases like this we can keep the size of the construction workforce down to under 550 people on site at any one time, but spread over a few years," he said.

"This makes us much easier to manage and make the operation safer.

"A lot of the activity will also be offsite with modular components; it's about keeping the manning levels down on site."

Recent work on site included development of the airstrip, construction of a pre-owned 550-person accommodation village, and mobilisation of the construction workforce.

Pending a mining lease approval expected early next year, the second phase is scheduled to begin in Q2 2018 and will involve the construction of the processing

plant, tailings facility and other above ground infrastructure.

"Carrapateena is a fantastic resource, it's very big and the grades are very good," Mr Cole said.

"In a nutshell if you compare Carrapateena to other projects [globally] it has got to be one of the strongest copper developments in the world."

## Prominent Hill

Further north, the Prominent Hill mine was growing with an updated mine life extending out to 2026.

The northern South Australian operation first came online in 2009, and now produces more than 100,000t of copper a year.

In 2012, the first underground mine

Ankata was established, and in 2015 OZ Minerals commissioned the second decline Malu underground, as mining at the open pit approached completion in 2018.

In October, OZ Minerals announced it would fast track the closure of the open pit to the first quarter of next year (instead of mid-2018) to deliver cost savings.

"An accelerated mine plan will bring forward open pit closure to Q1 2018 with associated net fixed cost savings of circa \$10 million over the remaining pit life," Mr Cole said.

Mr Cole added during the September quarter, Prominent Hill's underground mine performed strongly with production up 15 per cent and unit costs 21 per cent lower than the prior quarter.

"The second decline broke through to the open pit in August, enabling productivity and efficiency gains as the underground works to increase production to 3.5-4.0mtpa in 2019," he said.

"The operation is on track to deliver all other guidance metrics."

However, in August BHP announced it would be terminating Prominent Hill's power connection and access agreement from 30 August 2020 to facilitate the planned expansion of its Olympic Dam operation.

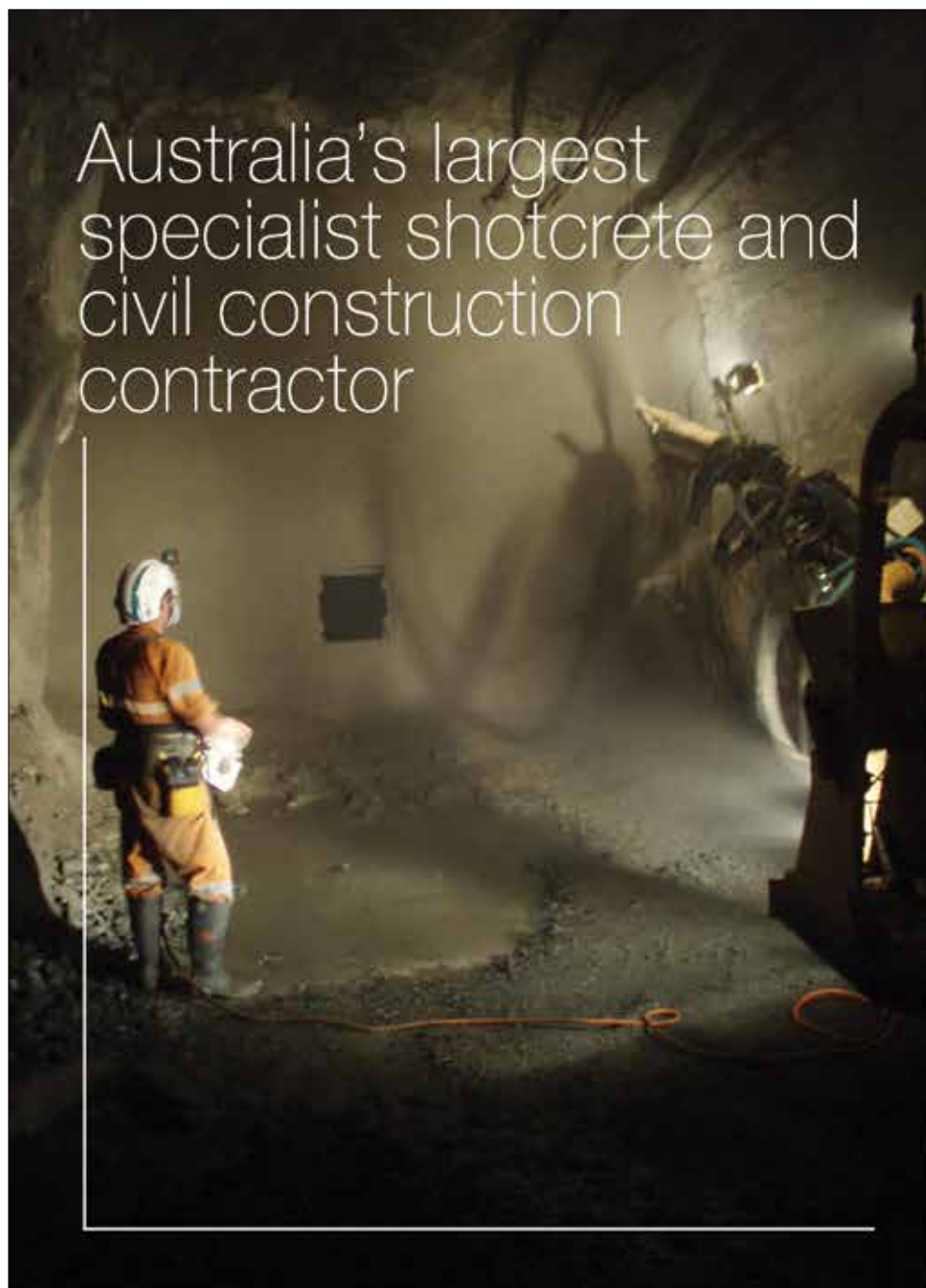
Under the existing agreement, Prominent Hill shares BHP's power line from Davenport to Olympic Dam, with electricity fixed at Prominent Hill to the end of 2018.

OZ Minerals assured shareholders the power termination was not expected to affect the mine's guidance until FY19, but may increase AISC from mid-2020.

(CONTINUED OVER)



# Australia's largest specialist shotcrete and civil construction contractor



## CORE SERVICES:

- Shotcrete & concrete design
- Concrete manufacturing and delivery (surface & underground)
- Robotic & hand spray shotcrete application
- Tele-remote & robotic shaft lining (wide range)
- Certified Design and drawings
- Civil design and construction



P: +61 8 9373 1111

E: Tendering@jetcrete.com.au

W: www.jetcrete.com.au

## (CONTINUED FROM PAGE 31)

Mr Cole said OZ Minerals had been working on a power strategy over the last couple of years, for Prominent Hill and Carrapateena.

In its September quarterly report, OZ Minerals confirmed commercial negotiations were nearing completion in relation to provision of emergency diesel generation options should this be required.

Renewable energy options were currently in the design stage, and a range of other energy saving programs were underway.

"We certainly have long term options for power at Prominent Hill, which will also help us with future site scaling options at Carrapateena," Mr Cole said.

"Over the next few years we're not going to see any changes to Prominent Hill or its costs.

"After that we could see a few per cent increases in All in Sustaining Costs at Prominent Hill as we put in longer term power solutions, but those longer term power solutions, while they might have a few per cent increase at Prominent Hill, they will actually enable us to look at more expansion optionality for Carrapateena and Prominent Hill over the longer term."

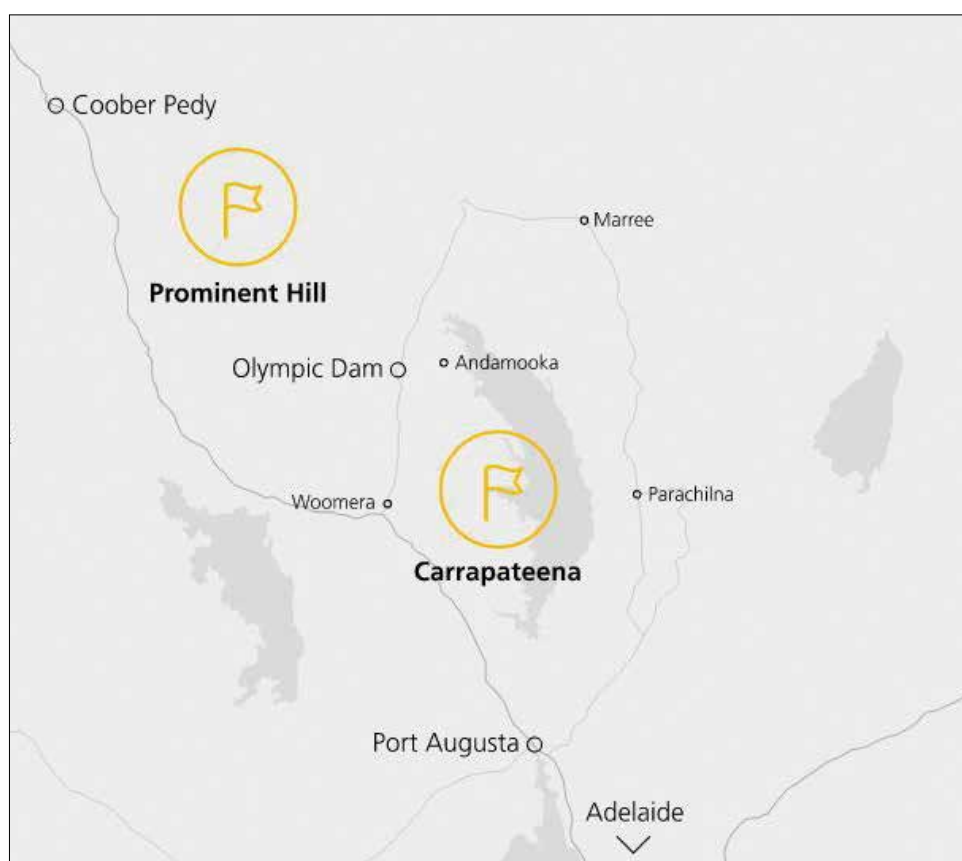
## Growth options

Beyond Carrapateena, OZ Minerals was about to kick off a pre-feasibility study at the West Musgrave JV in WA.

In August 2016, the company signed an agreement with Cassini Resources to earn up to 70 per cent of the copper-nickel project.

On 14 November, OZ Minerals announced it would begin a pre-feasibility study at the project following positive results from a scoping study of the Nebo-Babel deposit.

OZ Minerals would also proceed to the



next stage of its earn-in agreement and earn a 51 per cent stake in the project by spending \$19 million within 18 months.

"The Further Scoping Study has confirmed the economic viability of the Nebo-Babel project and has increased our confidence in the potential of the project," Mr Cole said.

"This is an exciting new mineral province with attractive near mine and district opportunities.

"Investment will be made during the prefeasibility to focus on Inferred to Indicated Resource conversion for inclusion

into the mining inventory thereby extending mine life within the current pre-production capital profile."

The project has an initial eight year mining life, with a clear view to increase this to beyond 15 years.

"In five years' time, if all of the works go well, West Musgrave will be at the tail end of construction," he said.

Moving forward, Mr Cole said the company would also look at growing Carrapateena once it had entered production.

"The Carrapateena development right now is focused on just over 80 million tonnes of

mining inventory; the total footprint of the mineralised ore body there is 800 million tonnes, so there's opportunity to grow Carrapateena in time," he said.

"There's also other mineralisation in the area, namely Fremantle Doctor and Khamsin, which we will study and drill over the coming couple of years to understand what our future optionality of Carrapateena is.

"We've got another number of projects in the pipeline which we're working on now and we'll keep adding to that pipeline so we can create real value by taking resources and converting them into operating mines."

## Q3 2017 HIGHLIGHTS

### Prominent Hill production:

28,880t Copper & 29,264oz Gold

•  
**Underground production up 15% and unit costs down 21% on Q2**

•  
**Carrapateena phase one construction begins**

•  
**Cash balance increased from \$625 million to \$639 million**



# AN (UN)REFINED STRATEGY

Surging demand from Chinese alumina refineries is helping push the price of the bauxite back up – for now, anyway – ahead of the country's aggressive winter shutdown policy. Yet the long term fundamentals are very promising, and Rio Tinto's Amrun development is poised to take advantage.

All images: Rio Tinto.

## REUBEN ADAMS

IN August, Chinese bauxite and alumina imports increased 46 per cent and 123 per cent respectively.

By late October the alumina price, based on Metal Bulletin's FOB Australia index, had climbed 53 percent to \$469.74 a tonne in two months; its highest level since the index was launched in 2010.

In an October note, Wood Mackenzie senior analyst Ami Shivkar stated that there was still steam left in the price rally ahead of the mandated winter refining shutdown.

"All the Chinese refineries don't have the amount of bauxite they want and smelters are still stockpiling."

Long term forecasts are also positive.

In August, Rio Tinto predicted that imports would play an increasingly important role for China, which continued to add refining capacity while grappling with declines in domestic bauxite quality.

Australia is the world's largest producer of bauxite, accounting for about one-third of global output in 2016-17.

Domestic production is expected to reach 83.4 million tonnes in 2016-17, up from 72.9 million tonnes in 2011-12 according to IbisWorld.

North QLD has some of Earth's largest known bauxite deposits, and the region is home to a number of advanced, world class projects as companies look to take advantage of healthy demand.

Leading the charge is Rio Tinto's Amrun project, which is scheduled for completion in 2019.

Announcing the development decision in November 2015, former Rio chief executive Sam Walsh called Amrun one of the highest quality bauxite projects in the world.

"This long-life, low-cost, expandable asset offers a wide variety of development

options and pathways over the coming decades," he said.

"We are establishing Cape York bauxite as the product of choice for the Chinese seaborne market with consistent quality, security of supply and strong technical marketing support.

"Amrun will be significant in helping to meet growing bauxite demand from China."

This forecast is proving correct. With revived plans to reduce exposure to downstream aluminium processing through the sale of its 'Project Lego' assets, Rio is seeing bauxite exports as its most value-generative proposition.

"Prospects for bauxite – a sector where Rio Tinto maintains a very strong competitive position – are positive," Rio's 2016 Strategic Report stated.

"The projected growth rate, mostly driven by seaborne bauxite traded into the China market, is outpacing that of aluminium.

"This is due to both a desire by China to be self-sufficient in alumina, and the continuing depletion and reduction in quality of China's bauxite resource position."

The \$2.6 billion Amrun project involves construction of a bauxite mine and associated processing and port facilities about 40km south of the Embley River near Boyd Point on Cape York Peninsula.

Once operational, Amrun will replace production from the existing East Weipa mine and increase overall annual exports by about 10mtpa. Planned initial output is 22.8 million tonnes per year, but there are options for future expansions up to 50mtpa.

By March 2017 Rio had awarded more than \$900 million in contracts to 509 QLD suppliers; and almost two thirds of the \$1.38bn in contracts were awarded to Australian suppliers.

Third quarter results saw the project on schedule for first shipment in H1 2019, according to the company.

"The Amrun project is advancing to plan



with key construction activities continuing, including installation of the first three wharf modules and fabrication and transportation to site of the process plant beneficiation modules," the company stated in its Q3 report.

**"The projected growth rate, mostly driven by seaborne bauxite traded into the China market, is outpacing that of aluminium."**

## A national project

By November, Amrun had created 470 jobs across Australia, Rio announced.

In 2016, WA supplier Civmec was awarded

the \$160m contract to construct a processing facility, including a beneficiation plant and associated water, electrical and lighting systems.

The fabrication, pre-cast manufacture and assembly work for this facility has taken place at Civmec's Perth-based Henderson facility, where about 350 employees including subcontractors are working on fabrication and another 120 on module assembly.

In October, a heavy load vessel transported three beneficiation modules and a transfer tower into the Port of Weipa.

These modules each weigh more than 1200 tonnes with dimensions of up to 16 metres wide, 25 metres long and 30 metres high.

The remaining three modules were due to arrive this month.

The beneficiation modules will form the central facility of the plant, where bauxite from the Amrun mine will be washed and screened onsite before being shipped to customers.

The fabrication of key components were also made with 95 per cent Australian steel.

Rio Tinto Amrun project director Marcia Hanrahan said fabrication of these components had showcased best practice Australian manufacturing using 4000 tonnes of Australian steel.

"Construction of the processing facility has created hundreds of jobs in WA, in addition to our current Amrun workforce of around 1200 in QLD," she said.

Businesses bidding for contracts over \$1m completed a Local and Indigenous Participation Plan as part of the procurement process.

"Almost 80 per cent of the Amrun workforce are Queenslanders including 176 indigenous employees of which 43 are local Aboriginal people," Ms Hanrahan said.

"We are proud of the supplier and employment opportunities we have created for Australians and there will be more to come."



The Aggreko logo, featuring the word "aggreko" in a bold, orange, sans-serif font.

# Power, cooling and heating at every stage of a mine's life-cycle

Mining operations are long-term projects so we support you at every stage. We're with you for exploration, project planning and site construction. We stay on for commissioning and production – providing technical advice and expertise when you're ready to expand. And we're by your side to help with closing the mine at the end of its life. However remote your location, we'll take care of the power, cooling, heating and dehumidification – freeing you to concentrate on the mining.



Call us to learn more 1300 929 031

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



# WHEELS IN MOTION

Recent worker strikes over employment conditions have not hampered Pacific National's next round of developments under the fresh leadership of former BHP chief operating officer Dean Dalla Valle.

All images: Pacific National.

## ELIZABETH FABRI

IT'S been an eventful six months for interconnected rail freight operator Pacific National.

In July, veteran mining executive Dean Dalla Valle was appointed chief executive of the company to replace David Irwin; a defining moment as Pacific National lays the groundwork for its next wave of growth options.

Mr Dalla Valle was best known for his four decade run at BHP, including recent work managing the global miner's response to the tragic Samarco dam disaster in Brazil.

His move to the freight industry mirrored former Rio Tinto Iron Ore chief executive Andrew Harding's decision to join Aurizon as its new chief executive in December 2016.

In August, less than a month into the new role, Mr Dalla Valle had inked a deal with major competitor Aurizon to purchase its Acacia Ridge Terminal south of Brisbane in a bid to supplement Pacific National's national terminal network.

Separately, Pacific National also signed a binding agreement to take over the Aurizon Queensland Intermodal business as part of a consortium with Linfox.

The intermodal business had been operating at a financial loss for some time, which Aurizon attributed to issues around establishing significant scale and a customer base to support the business in such a highly competitive market.

"Queensland Intermodal supports Pacific National's strategic objective to grow in important markets and allows for Pacific National to offer new northbound services and southbound services within Queensland on day one," Mr Dalla Valle said.

As part of the deal, Aurizon will sell two components of the Intermodal business and



close the third.

Aurizon would also transfer about 350 employee positions as well as assets, commercial and operational arrangements to the Linfox and Pacific National consortium, on top of the 30 Aurizon employees it would transfer under the Acacia Ridge deal.

Total consideration for the two transactions was \$220 million, and if the Acacia Ridge transaction was not complete within six months, Pacific National would have to fork out an additional \$5 million.

Both agreements were now awaiting approval by the Australian Competition & Consumer Commission (ACCC) and the Foreign Investment & Review Board.

But Pacific National didn't stop there.

On 24 October, the company announced it would commit \$35 million to kick start the development of its Parkes Logistics Terminal project; a major inland freight port on the junction of two of Australia's national rail lines.

"Parkes sits at the epicentre of Australia's rail freight network," Mr Dalla Valle said.

"Located at the intersection of the main western railway line running from Sydney to Perth, the future Inland Rail corridor from Melbourne to Brisbane, and the Newell Highway, Parkes is the perfect place to establish a major intermodal freight terminal."

The \$35 million spend included \$18 million to begin development of the terminal site and \$17 million to acquire 'rolling stock' like freight wagons.

Pending final Government approvals, once developed the terminal would have capacity to process about 450,000 cargo containers each year, and the ability to haul double-stacked containers from Parkes to Perth.

Construction was expected to begin by mid-2018 with first trains hauling freight at the terminal in early 2019.

## Pay Disputes

Pacific National has also been concurrently embroiled in industrial action over issues with new employee enterprise agreements.

The company has been in negotiations with the Rail, Tram and Bus Union (RTBU) since May concerning worker conditions, such as pay, breaks, RDOs, and better quality accommodation.

At the beginning of negotiations the RTBU submitted an application to the Fair Work Commission to have one enterprise agreement for all Pacific National employees at the request of members.

In October, Pacific National informed RTBU it would proceed with two separate agreements for its bulk freight and coal haulage businesses.

In response, in the last two weekends of October, the union organised two 48-hour strikes involving hundreds of Pacific National's train workers.

According to Platts, the strikes resulted in the cancellation of 90 trains in the first weekend, causing delays to Newcastle coal shipments.

The company usually runs 500 freight train services each week in NSW covering the transport of coal, cement, aggregates, and other bulk products such as grain, and livestock.

Pacific National said it had the "highest regard" for its train crews and said it had continued to negotiate in good faith with the RTBU for a new enterprise agreement for its NSW bulk freight business unit.

"Pacific National is continuing to work towards a timely resolution in the best interests of our employees, customers and the business, and we are working around this industrial action to meet our customers' needs," the company said.

"We are not looking to reduce the terms of employment of our train crews, but simply want to better utilise the hours they are being paid, to help the company remain efficient in a competitive sector."

Pacific National and RTBU are continuing negotiations to discuss a way forward.



# Long-proven service to rail

VARLEY Group is a diversified engineering and manufacturing company.

Since its establishment in 1886, Varley has grown its workforce to more than 1000 employees, with operations in all mainland Australian States, plus an additional three in the US and two in Indonesia.

Two major industries serviced by the company are rail and specialised vehicles.

Varley's ONRSR-accredited rail division has provided engineering and maintenance to the industry from its strategically-located facilities in Newcastle since 1984.

It also provides customer field service and support for breakdown repairs, in-field maintenance, and wagon recovery.

Varley has a long and successful association with Pacific National, having serviced its extensive rolling stock assets and performed fleet refurbishments since Pacific National's formation in 2002.

The company's specialised vehicle division – also known as Varley Specialised Vehicles – designs, manufactures and services a wide range of rail-related vehicles including rail shunters, road rail vehicles, infrastructure maintenance vehicles, overhead wiring maintenance (OMVs), elevated work platforms (EWPs) and many other custom vehicles.

Varley has a proven record of completing fleet refurbishments and working with customers to achieve favourable outcomes.

With extensive experience over many decades, Varley offers a high level of expertise in rolling stock maintenance.

The business is supported by its excellent



One of the many wagons Varley has refurbished for Pacific National.

rail facilities, which promote low cost and timely movement of rolling stock.

Its advanced facilities in Carrington, Newcastle, are well-equipped to hold multiple wagons on seven railroads and include a full-length undercover locomotive pit and

wash bay suitable for 180T locomotives.

As part of its growth strategy, Hinton Engineering recently became a part of the Varley Group.

A long-established and highly-reputable rail business, Hinton specialises in the design

and manufacture of hi-rail and infrastructure equipment, as well as rail access certification for all hi-rail equipment across multiple States.

More information about Varley Group can be found at: [www.varleygroup.com](http://www.varleygroup.com).



 [www.varleygroup.com](http://www.varleygroup.com)

 02 4964 0400

 [rail@varleygroup.com](mailto:rail@varleygroup.com)

- ▼ ONRSR-accredited with strategically-located facilities in Carrington, Newcastle NSW
- ▼ Workshop and field service for rolling stock maintenance, breakdowns and wagon recovery
- ▼ More than 50,000 rail wagons serviced, refurbished and maintained to schedule since 1980
- ▼ Rail access certification for hi-rail equipment across multiple states
- ▼ All facets of fleet refurbishment and rolling stock maintenance offered to customers nationwide
- ▼ Specialised vehicle design and manufacture: shunters, road-rail, maintenance, overhead wiring and EWPs







**“With many analysts predicting strong long-term fundamentals for the copper market over the coming years, Sandfire is exceptionally well placed to deliver growth.”**

# SELF DISCOVERY

As development of the Monty deposit continues to schedule, Sandfire Resources is making moves to unlock the full potential of the Greater Doolgunna orebody.

Images: Sandfire Resources.

## CAMERON DRUMMOND

‘EXPLORATION and expansion’ has been Sandfire Resources’ mantra in 2017 against the backdrop of a very healthy copper market.

As the Monty development (Springfield JV) progresses, a key focus for Sandfire has been intense, multi-pronged drilling programs around its Greater Doolgunna project and the Springfield JV which covers 5846 square km.

A farm-in agreement between Sandfire and Enterprise Metals was also signed in October for Enterprise’s entire Doolgunna project area.

After spending \$1.5 million drilling in the area, Sandfire can sole fund exploration and earn a 75 per cent interest in the project by discovering and defining mineral resources of at least 50,000 tonnes (t) copper metal or equivalent.

Sandfire wasted no time, completing 1481 drill holes for 125,672m in Enterprise tenements by the start of November.

The miner said it would continue its major 600-hole AC drilling program at the farm-in project to test 50 strike kilometres of the interpreted favourable volcano-sedimentary sequence which hosts the DeGrussa and Monty copper-gold deposits.

“We are very pleased that Sandfire is continuing to undertake a thorough and systematic exploration program in Enterprise’s Doolgunna Project area,” Enterprise managing director Dermot Ryan said.

“We are looking forward to the results of Sandfire’s extensive geophysical surveys and drilling programs.”

Sandfire said it would also continue with intensive drilling programs at its own Doolgunna tenements, with exploration focused along the highly prospective VMS corridor that hosts both the DeGrussa and Monty deposits.



Exploration drilling at Greater Doolgunna.

## Monty development

Discovered in 2016, the Monty copper-gold deposit is the central focus of Sandfire’s 70 per cent owned Springfield joint venture (JV) with Talisman Mining (30 per cent).

A feasibility study conducted in early 2017 outlined a 70,000t of copper, 21,000 ounces (oz) of gold and 288,000oz of silver operation with a three-year production life. An investment decision was quickly made to go ahead at a capital cost of \$90m.

During the year the project has progressed on schedule, with the completion of haul and access roads, excavation of the box cut for underground access, and the commencement of the decline, stockpile and laydown area pads and infrastructure works.

Cutting of the decline portal for the new underground mine was expected to commence this month, and underground development was expected to take about one year, with first ore scheduled for Q2 FY19.

Sandfire’s exploration and discovery strategy also included the testing various

new geological interpretations at Monty NE, Monty East and Homer South, along with geochemical anomalies identified within the Southern Volcanics.

In fact, its December quarter exploration budget would focus predominantly on Springfield.

The planned work continues from the previous quarter, which was primarily focused on detailed geological reviews, and the interpretation and assessment of Induced Polarisation (IP) geophysical data collected over the Monty and Monty NE areas.

“Joint venture exploration efforts continue to re-evaluate and reinterpret geological, geochemical and geophysical data on an ongoing and iterative basis to maximise discovery opportunities within the Springfield area,” Mr Simich said.

## Production

After proving up resources during the year, Sandfire released its mineral resource and reserve estimate for its assets.

Resources across the DeGrussa, Monty, Black Butte, Thaduna, Green Dragon and Temora projects were estimated to contain a total of 1.9mt of copper, 2.7moz of gold and 15.8moz of silver.

DeGrussa and Monty accounted for group reserves of 9.5mt at for 372,000t of copper, 439,000oz of gold and 5,941,000oz of silver.

Production FY17 was at the upper end of guidance at 67,088t of copper and 38,623oz of gold, slightly down on FY16 figures of 68,202t of copper and 37,612oz of gold.

During the September quarter, production was sourced from all lenses at DeGrussa, amounting to 437,136 tonnes grading at 3.79 per cent copper.

Copper production was 15,258t (June Quarter: 17,092t), and C1 cash operating costs for the quarter were \$US0.95/lb, in line with previous quarter levels.

Targeted copper production for FY18 remained unchanged, with production expected to be in the range of between 63,000t and 66,000t of contained copper metal, and between 35,000oz and 38,000oz of gold.

C1 cash operating costs were expected to be within the range of \$US1.00-1.05/lb; at the lower end of the normal operating range due to high gold production and increasing gold price assisted by-product credits, offset in part by a strengthening Australian dollar.

Mr Simich said Sandfire would continue its exploration and expansion strategies into 2018.

“With many analysts predicting strong long-term fundamentals for the copper market over the coming years, Sandfire is exceptionally well placed to deliver growth, leveraging from the company’s high grade, high quality mining operation at DeGrussa; a new ultra-high grade mine coming on stream at Monty; outstanding exploration upside in the world-class Doolgunna VMS district; and a growth pipeline including the Black Butte deposit and other emerging opportunities on the East Coast of Australia,” he said.



# COLLAHUASI

## BOOSTS AVAILABILITY OF ITS VPA FILTER



Faced with increased production demands, Compañía Minera Doña Inés de Collahuasi had the goal of increasing both the availability and performance of its vertical plate pressure filters (VPA) in Puerto Patache, which were becoming outdated after more than 20 years in operation.

In collaboration with Metso, Collahuasi developed an upgrade plan based on using state-of-the-art technology; the desired objectives were met and resulted in a 15 per cent increase in filter availability.

THE project was carried out at Collahuasi's mine in northern Chile, about 180km southeast of the port of Iquique, at an altitude of 4400m.

This mining district has been in business since 1880 with the exportation of high-grade copper-silver vein systems.

Currently, it is dedicated to the extraction and production of copper and molybdenum concentrate.

During 2016, Collahuasi was the third-largest copper operation in the world and has one of the largest deposits of mineral resources of copper on the planet (9.964 million tonnes). Its shareholders are Anglo American plc (44 per cent), Glencore (44 per cent) and Japan Collahuasi Resources B.V. (12 per cent).

Collahuasi was facing the great challenge, common to many global mining groups, of optimising its operations to achieve the highest levels of efficiency.

"In order to ensure productivity and profitability in the future, Collahuasi has decided to develop a preventive maintenance improvement program, which is comprised of a master plan to maximize availability and minimize bottlenecks, through a long-term and sustainable approach. Its objective is to detect potential problems in advance and maximize the performance and availability of existing equipment," Collahuasi vice president for processes Dalibor Dragicevic said.

In addition to the VPA filters, Collahuasi also has other equipment from Metso such as semi-autogenous (SAG) grinding mills, ball mills, and Vertimills.

### Ageing equipment poses a challenge

Thanks to the collaborative relationship between Collahuasi and Metso, a joint diagnostic meeting was held to review the main needs and potential improvement to the filtrate-concentrate level, which was

related to the requirements of its VPA vertical filters to increase their production capacity while also increasing the overall reliability of the system.

Due to the high productivity requirements and over 20 years of use since its installation, the filters were showing a high degree of wear and misalignment, which reduced their availability due to the extra maintenance required by the filters and considerable unplanned downtime.

During the review stage of the overhaul, a joint decision was made to improve and upgrade the control systems, lubrication and structure of the equipment in order to achieve higher levels of availability.

### Equipment refurbished to as new condition

The challenge for Metso resulted in upgrading the control systems to the latest technology, achieving values of over 92 per cent availability and 100 per cent of design capability.

This involved reinstalling and upgrading equipment in less than 20 days to minimize lost production.

The engineering coordination, parts procurement and planning activities began six months earlier in order to ensure the complete compatibility and successful outcome of this upgrade.

### Comprehensive technological solution

The extensive upgrade of the equipment involved multiple steps. The Metso team first proposed improving the original design capacity by updating components and systems to produce some important benefits.

For this, Metso focused on the main problems that were causing the structural misalignment of the filters. In order to solve the structural problems, the filter



Changing the plates of the filter.

was completely disassembled and over 80 per cent of its parts were replaced with new parts using a nanocoating technology for corrosive environments.

Using this approach would double the lifespan of the key parts and components and reduce potential downtime.

In order to achieve the optimal selection of fabric, a pilot filter was implemented at the worksite to take samples of concentrate. The samples were then used to help define the proper fabric for the filtering process given the specific mineral conditions that Collahuasi was processing.

In many situations, these types of tests involve using Metso laboratories located in Brazil and Finland. However, with the pilot filter on site, it was possible to perform all the tests in situ with the client, improving

the selection and making it easier and quicker to get the results.

Another technological improvement introduced was the implementation OCS-4D, an advanced process control solution.

The solution assisted in determining the optimal control modes through analyzing the interplay between the selection of fabrics and maintenance events.

Finally, the chute was also examined for possible improvement opportunities. As the VPA filters discharge the filtered material (cake) into the chute, it was subjected to high rates of wear, causing a reduction in performance. Various designs and options were examined to improve ease of maintenance and thus reduce downtime.

"Searching for a design that improved maintainability, we implemented new, modular design upgrades to the chute, so that it could receive maintenance section by section," Minerals Process Equipment manager Alejandro Bravo said.

"Thus, when a specific part shows signs of wear, we can disassemble that part and change it quickly.

"This is also an improvement that was tailored for the client, given that with the original design we had to disassemble the entire equipment to be able to change some parts."

### Expanding the project

Given the success of the project, Minera Doña Inés de Collahuasi SCM is evaluating the implementation of the same upgrade concept in other VPA filters as part of its asset management plan.

"With this solution, we have been able to meet some of the availability goals we set for 2017. The filter today works according to the plans drawn up with Metso, which helps us to continue operating efficiently," Collahuasi Symptomatic Process senior engineer Cristián Barros said.



# A blueprint for wealth generation

THE mining industry has experienced a slowdown for the past couple of years, and as wages and jobs become tighter many people in mining have used this period as an opportunity to make sure they are getting ahead financially.

Many people seeking advice from Blueprint Wealth complain that they do not feel like they are making the most of their current income.

They feel as though their time spent in mining earning high wages should have them in a better position than they currently are.

The team at Blueprint Wealth are big believers in not being able to change the past, but learning from it.

“Working in the mining industry can be lucrative and we see many high income earners establish large amounts of investments; these people work hard and don’t have a lot of time to spend in this area so they use a company like ours that specialises in building wealth,” Blueprint Wealth director David Baruffi said.

Financial planning is about looking at an individuals’ current situation, working



Blueprint Wealth financial advisor Brad Martin presenting at the Kanowna Belle mine site in Kalgoorlie, WA.

out what is best for them, then helping that person put that best practice into place.

Every good financial plan needs to be

regularly reviewed. Situations change – it could be a person’s job, income, house upgrades or having another child. All of these impact the original plan put in place.

Blueprint Wealth can assist people to make the most of their incomes and help them feel like they are getting ahead financially and not just “spinning their wheels”.

The company sits down with clients and puts plans in place to get them on track to maximising their financial position.

Over time, Blueprint Wealth can show people the benefit and reward of sticking to their tailored strategy.

*Blueprint Planning Pty Ltd (ABN 78 097 264 554), trading as Blueprint Wealth, is an Authorised Representative and Credit Representative of AMP Financial Planning Pty Ltd, Australian Financial Services Licensee and Australian Credit Licensee.*

*This article contains information that is general in nature and does not take into account your objectives, financial situation or needs. Therefore, before making any decision, you should consider the appropriateness of the advice in regards to those matters.*



Springvale Coal's Anthony Brown with REMA TIP TOP Product Engineer Scott Hancock and some fresh pink rollers ready to be installed.

## Generating breast cancer awareness

REMA TIP TOP has donated more than \$5200 to the Cancer Council as part of its 2017 Pink Roller campaign.

The Pink Ribbon inspired conveyor belt roller campaign saw REMA TIP TOP come together with its roller manufacturer partner, Hong Kong based RKM Rollers, to produce a bright pink roller distributed to mine sites that opted into the initiative.

Several thousand pink rollers were distributed to NSW mine sites as a result of the campaign, and the team is now looking to take the initiative to a national level in 2018.

REMA TIP TOP chief operations officer Craig Philpotts said the work on the 2018 campaign would be beginning immediately.

“By engaging the major mining houses, we hope to add one, if not more zeros to that donation next year,” he said.

“This money goes towards grass roots initiatives that benefit cancer suffers locally, and around Australia.

“The work of the Cancer Council is incredible, and we’re glad to be counted amongst its many passionate supporters.”

# Tough jobs, tough pumps



Two LH690 90kW dewatering pumps in a mine staging pit.

AUSTRALIAN Pump Industries (Aussie Pumps) reintroduced Tsurumi’s LH series submersibles to Australia’s mining industry six years ago.

The aim was to repeat the great success achieved by the product in South Africa, the US and Canada.

Tsurumi’s LH series represents a breakthrough in design and concept for mine dewatering pumps that face the harshest conditions.

The submersibles are cylindrical in shape; very different to the conventional ‘broad belly’ design.

The obvious advantage for users is that Tsurumi pumps are equipped with high chrome iron impellers, designed for long lasting service and performance.

The ranges starts with 100mm (4”) pumps all the way through to 8” pumps in a power ranged from 22kW through to 110 kW. The pumps will

deliver flows of up to 6500 litres per minute and heads as high as 150m.

### They don’t break

Tsurumi’s whole program is based around machines that are capable of providing continuous service with minimal maintenance.

The unique, anti-wicking cable entry prevents water incursion due to capillary wicking. This means that even if the cable is cut, damaged, or the end submerged the water that penetrates the cable cannot wick into the motor.

The pump chamber has twin dual silicon carbide mechanical seals. These seals are rated as 5 times higher corrosion and heat resistance than tungsten carbide. The unique design incorporates an oil chamber with an ‘oil lifter’ that ensures complete lubrication and cooling to all seal faces.

### Tsurumi LH series: Mine Friendly

The slimline design means the pump can be installed in narrow spaces.

It can even be used in bores and wells, substantially reducing installation costs. The flanged top discharge outlet ensures the pump is balanced for lifting.

### Tsurumi: The Mining Solution

Australian Pump’s cooperation with Tsurumi’s engineers has been rewarded with the fast-tracking of pumps that particularly suit Australia’s mining market.

Today, the fulfilment of the program includes 316 grade stainless steel LH series pumps from 22kW to 37kW and even as high as 110kW.

A comprehensive free literature pack is available from Australian Pump Industries on (02) 8865 3500.





The Alice Springs Convention Centre is located in picturesque surrounds.

## Corporate functions in the NT

ALICE Springs Convention Centre (ASPCC) is a dedicated convention centre with contemporary architecture that reflects the colours of the Red Centre and the rustic appeal of outback Australia.

The centre is equipped with state-of-the-art technology, best practice environmental controls and quality service

delivery.

It caters for small meetings of 10 people through to conferences of 1200 delegates, or large exhibitions of up to 3000 visitors.

Alice Springs is almost exactly in the middle of Australia, making the ASPCC the perfect location for national conferences, meetings, incentives and gala events.



Alice Springs Convention Centre  
for your next conference or event



The heart & soul of Australia's best events. The Centre boasts state of the art facilities, professional friendly service and offers delegates the opportunity to experience the true essence of the outback.



info@aspcc.com.au | alicespringsconventioncentre.com.au | (08) 8950 0200

THE AUSTRALIAN  
MINING REVIEW

## PROFILES FOR JANUARY 2018

4 Wheel Drive Training  
Auctioneers  
Catering & Facilities Management  
CNC Machining  
Cranes & Lifting  
Crushing & Screening  
Data Management  
Dust Control  
Earthmovers & Excavators  
Fluid Control Systems  
Heat Transfer Solutions  
Heavy Duty Convex Mirrors  
Industrial Flooring and Coatings  
Industrial Tanks & Storage  
Mining Education  
Oils, Greases and Lubricants  
Plastic Fabrication  
Server Room Solutions and Accessories  
Virtual Reality for Mining  
Wear Resistance

**CALL US** TO BOOK YOUR PLACEMENT TODAY

BOOKING DEADLINE: **December 1st 2017**

**BRAD FRANCIS**

☎ (08) 6314 0303    📞 0405 345 312

✉ brad@miningoilgas.com.au



All images: Australasian Corrosion Association.

# CORROSION CONTROL FOR MINES

Corrosion of physical infrastructure vehicles, and machinery at mining operations and manufacturing facilities must be managed effectively to maintain safe and profitable operations.

Severe corrosion of a structural I-beam.

## AUSTRALASIAN CORROSION ASSOCIATION

ANY equipment failure can be expensive in terms of lost production and cost of repairs.

An estimate for the cost of lost production for a single dragline is \$8000 per hour in Australia, making any breakdown very costly when it might take weeks for a replacement part to be available.

Machinery used to access, remove and haul away coal and other mineral resources at mine sites is often used during every shift and is under constant operational stress due to the sheer weight of the material or the rotation and vibration of components and engines.

Draglines and shovels are two key pieces of operating equipment with many shafts, pins, bores and lugs on them.

The corrosion of physical infrastructure at a mine site—mills, tanks, foundations, bunds—also has to be managed.

“There is a lot of concrete on a mine site that needs to be protected,” Extrin principal corrosion engineer Dr Peter Farinha said.

“This is often more important in terms of asset values when they need to be replaced.”

The operating environment of both vehicles and equipment impact their effective service life.

Variable climatic conditions can be damaging and the harsh physical environments of remote mine sites also take their toll.

These conditions include the dust, rocks and unmade roads in the arid, desert heat of Outback Australia through to cold alpine highlands and humid tropical coasts.

In some parts of Papua New Guinea and New Zealand equipment has to operate in sulphurous steam found in active tectonic areas.

The massive tyres of haulage trucks are

extremely expensive to replace.

“A rock scratch can potentially expose the metal reinforcing which then can corrode,” IAS Group WA principal corrosion and coating engineer Graham Carlisle said.

**“While coatings continue to be used, the industry is also looking at the judicious use of more corrosion resistant materials, such as duplex stainless steel and aluminium alloys, in the design of plant and equipment.”**

“However, it is now possible to patch-repair damaged tyres with urethane-based elastomeric compounds.”

Ground water used in many mines for processing and equipment washdown is usually hyper-saline.

“Such water is extremely aggressive and damaging to infrastructure,” Mr Carlisle said.

“The high concentrations of chlorides rapidly seep into the concrete and begin to degrade the embedded reinforcing steel.

“Mine site ground water is often three times as salty as sea water, so mobile equipment on the ground cops a real hammering,” Dr Farinha said.

“Acidic gasses cause premature corrosion so there is not much left of your four-wheel drive after two years.”

According to Dr Farinha, areas of equipment and structures that are prone to rapid corrosion—but are often overlooked—are cable looms and connectors.

## Protection

One way to protect the external surfaces of vehicles and machinery is to use spray applied surface protection, such as a polyurea or polyurethane.

Such coatings can extend the service life of a vehicle and associated equipment, in addition to reducing maintenance and repair costs.

Mr Carlisle stated that it is not just the outside of vehicles and structures that can be coated.

Mines feature large numbers of high pressure and volume pumps for moving water and processing slurry about the facility.

“Mine fluid flow systems suffer from an accelerated ‘erosion corrosion’ process, where particulates in the water or slurry scour the internal surfaces of pipes and pumps,” he said.

A recent repair project Mr Carlisle’s company was involved in was the relining of a 13-tonne split-case pump housing.

“We were fortunate that we could remove the whole housing to prepare and coat the inner surfaces,” Mr Carlisle said.

“In many situations it is too costly to interrupt a process running 24-hours a day so repair and remediation requires careful planning.”

In some processes, some members of the fixed structure are under water and other surfaces are constantly damp, so the coating material chosen must be able to be applied in wet conditions and withstand submersion.

Mine sites are extremely dusty, with dust and dirt settling onto all surfaces throughout the facility.

Structural steel I-beams and angle-iron are prone to accelerated ‘crevice corrosion’ where moisture soaks into the accumulated dust and begins corroding the metal that

supports heavy machinery or tanks.

“The corrosion is often not noticed until the structure is cleaned, but a simple remedy might be to install ‘shedder plates’ that allow the dust to easily slide off the metalwork,” Mr Carlisle said.

Another way to minimise losses is to continually monitor plant and machinery using non-destructive testing (NDT) methods to ascertain component health, and monitor mechanisms for damage.

However, it is important that inspections are performed with minimal down time or costs, so need to be planned and coordinated to ensure that replacements for critical parts are available when the maintenance is carried out.

NDT is a group of techniques used to detect discontinuities in materials or components without causing damage or permanently altering the article being inspected.

Outage and emergency repair costs can be a significant percentage of the total operating cost of a mine.

Finding a crack and repairing it before failure, or monitoring it until it needs replacement and ensuring that parts are ordered to arrive in time for the maintenance work to be carried out, saves both time and money.

## Best practice

To support industry, the Australasian Corrosion Association (ACA) works with academia and companies and asset owners to research all aspects of corrosion to provide an extensive knowledge base that supports best practice in corrosion management, thus ensuring all impacts of corrosion are responsibly managed, the environment is protected, public safety enhanced and economies improved.

(CONTINUED ON PAGE 42)



# Leaders in corrosion control

STEULER has become well known globally for its Industrial Corrosion Protection unit, which includes Surface Protection, Refractory Systems, and Plastics Engineering divisions.

Together, they create a unique combination of innovative material developments and lining technologies.

Steuler's plant construction and environmental technology implements custom, turnkey plants across the world, with an eye to protecting the environment.

With the integration of KCH (Keramchimie), acquired in 2010, Steuler has taken a further significant step in its corporate evolution.

For clients of the two brands – which have traditionally been in competition – excellent new prospects have opened up.

Having a joint range of corrosion protection products and services allows even greater synergies to be attained for both clients, and large scale international projects.

Whether it is protective linings, rubber linings, industrial flooring, brick and tile linings, or mechanically anchored thermoplastic linings; Steuler-KCH develops complete solutions for every application.

Refractory lining systems and equipment, tanks, piping made of thermoplastics and duroplastics complement and complete the portfolio.

Innovative material developments and lining technologies has made Steuler-KCH one of the world's leading providers of industrial corrosion protection.



Steuler's integration of KCH has formed a complete-range corrosion control business.

The close synergy between the company's divisions has created a unique complete package of lining technology

and experience.

With competence in engineering technology and experience in the field,

Steuler-KCH understands the chemical and physical demands of plants and process equipment.





## INDUSTRIAL LININGS AND EQUIPMENT FOR CHEMICAL PROCESS PLANTS

**Refractory Linings and Corrosion Protection Systems for:**

- Sulphuric Acid Plant Towers
- Sulphur Furnaces
- Fluid Bed Reactors
- Gas Cleaning Vessels
- Atmospheric Leach Tanks
- High Pressure Acid Leach Tanks
- Phosphoric Acid Tanks
- Electrowinning cells
- Secondary Containment Areas
- Acid Loading bays

**STEULER-KCH GMBH**  
 Berggarten 1  
 56427 Siershahn | Germany  
 Phone: + 49 2623 600-0  
 Mail: info@steuler-kch.de

**STEULER KCH Australia**  
 Office: + 61-7-5443 2991  
 Mail: enquiries@steuler-kch.com.au  
 PO box 5148  
 MAROOCHYDORE BC QLD 4558

[www.steuler-kch.com](http://www.steuler-kch.com)

NEW  
PRODUCT

STEULER  
A103-Mastic

Membrane for  
Sulphuric Acid Towers





(CONTINUED FROM PAGE 40)

**"Mine site ground water is often three times as salty as sea water, so mobile equipment on the ground cops a real hammering."**

Cavitation damage and scouring on the inside of a 13-tonne split-casing pump.

The resurfaced interior of the same pump.

Dr Farinha added that the training courses and technical seminars presented by the ACA have generated much greater awareness of corrosion management techniques.

"This awareness is leading to improved maintenance of mine site assets as site staff understand the importance of the effective monitoring of corrosion and planning for maintenance work to be carried out," he said.

A range of premium spray-applied lining and coating products that provide maximum protection against corrosion, scratches and dents is readily available.

The coatings form a permanent air and water-tight bond that inhibits rust, corrosion and surface abrasion.

It is vitally important that coating materials do not crack, warp or peel—even under extreme temperatures.

The structure of most polymers used for surface coatings has to be resistant to abrasion and chemical attack.

The material's strength comes from the bonding and cross-linking of the resin and hardener.

Companies providing surface coating application often work on a diverse range of projects.

Asset owners usually have to replace those parts of their machinery in regular contact with abrasive material—particularly earth, rocks and slurry at a mine or crops on a

farm—every year.

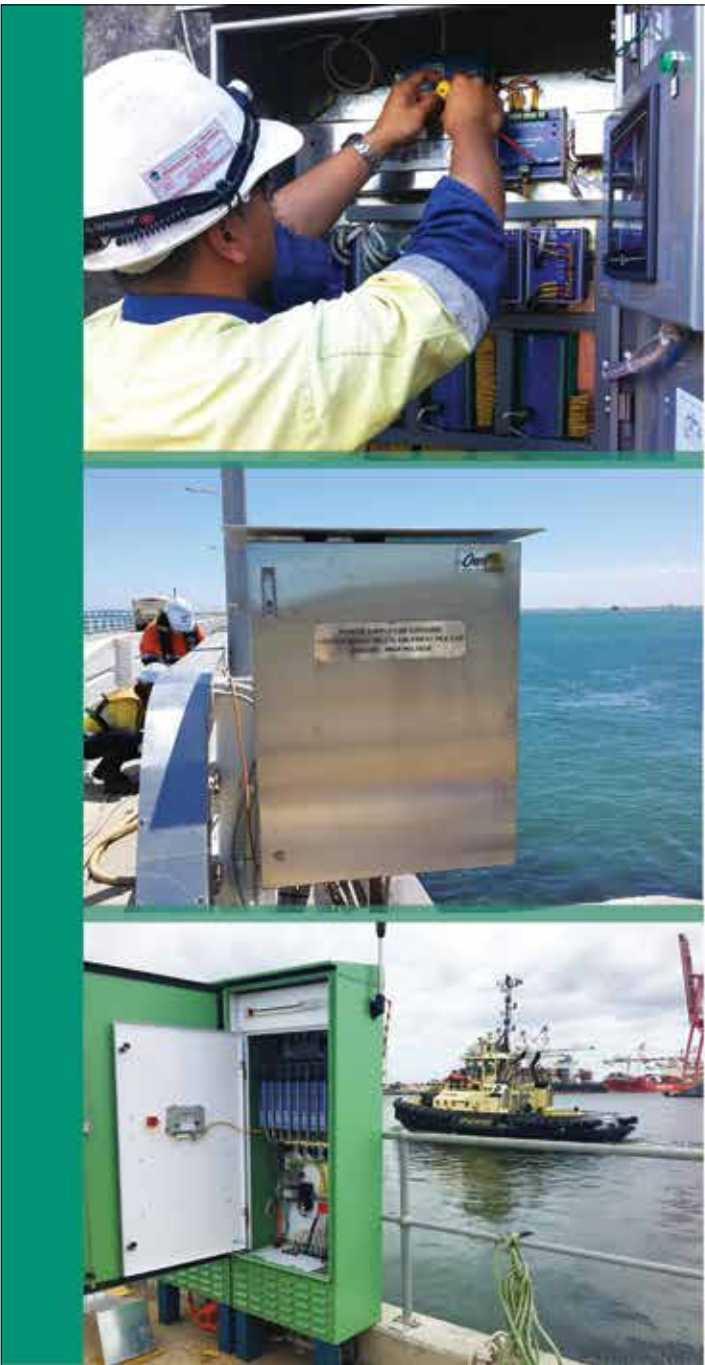
Coating such parts can extend the service life by several years, resulting in far less downtime.

According to Dr Farinha, coatings and linings are the most common corrosion management techniques used on mines but there is increasing use of cathodic protection systems to protect embedded steel, immersed steel and reinforced concrete infrastructure.

"While coatings continue to be used, the industry is also looking at the judicious use of more corrosion resistant materials, such as duplex stainless steel and aluminium alloys, in the design of plant and equipment," he said.

With state-of-the-art technologies and a comprehensive range of instrumentation available, mine operators have access to a wide range of non-destructive testing and corrosion management systems that are designed to extend the operational life of vehicles and equipment and thereby reduce maintenance time and costs.

Companies supporting the mining industry are committed to the development of new technologies, products, and services that offer the best solutions to meet the needs of its customers.



# PowerView CP



World-leading technology in  
Impressed Current CP Systems.  
Enterprise-wide web-based  
Remote Monitoring and Control  
of your CP Assets

- Improve oversight of asset corrosion
- Reduce ongoing testing and reporting costs
- One easy-to-use interface
- Can be retrofitted to existing CP systems
- Also monitor galvanic & hybrid CP systems



Call Omniflex on 02 8090 2144  
Email [aussales@omniflex.com](mailto:aussales@omniflex.com)  
[www.omniflex.com/cp](http://www.omniflex.com/cp)





## ELIZABETH FABRI

THE mining industry is 'kidding itself' if it doesn't think it has a substance abuse problem, according to Sideeffect chief executive David Hobbs.

"The mining industry has the same problems as building, construction and the transport industry when it comes to the use of illicit and synthetic substance abuse," he said.

The United Nations Office on Drugs and Crime *World Drug Report 2017* puts Australia among the largest consumers of Meth in the world and a study from the National Drug and Alcohol Research Centre showed regional areas account for 40 per cent of methamphetamine-related deaths; Sideeffect is tackling this statistic.

"Synthetic drugs in the resources sector and other Australian workplaces are on the rise, with workers increasingly seeing synthetic drugs as an acceptable alliance in their careers," Mr Hobbs said.

### "This is now a \$4.4 billion problem in Australia and needs to be cleaned up."

"We are finding more and more that high stress jobs with tight deadlines, lack of work/life balance, and lack of support are leading people to take drugs, particularly of the amphetamine variety, in order to 'achieve' the goals that are set for them, or that they may set for themselves.

"It can quickly become an accepted workplace culture, spreading like wildfire."

While mining companies have strict anti-drug and alcohol policies and rigorous testing already, the issue with synthetic drugs is that many still go by undetected because of their chemical makeup.

"All of these drugs are out there to mimic

other illicit drugs at a fraction of the price, the dangers are prolific, as there is no quality control and it is highly dangerous," he said.

"This is now a \$4.4 billion problem in Australia and needs to be cleaned up."

Mr Hobbs said he hoped once people heard that drugs such as Meth contained battery acid, phosphorous, and lime – all things that you'd buy at Bunnings – they would reconsider going down that path.

"Unlike pharmaceutical drugs, no measurements were used during the manufacture, making the finished product different in compound every time that they are made," he said.

"We inform people what's in these substances, what the outcomes will be both short and long term and what they have got to remember."

Sideeffect conducts drug education programs across Australia, which have been developed with unforgettable content that is confronting, memorable and educational.

"We leave a lasting impression that will hopefully be there when or if someone is offered a synthetic substance to take," Mr Hobbs said.

"Mental illness, psychosis, job loss, community safety, family abuse, a feeling of isolation and disconnect; synthetic drugs have a whole bag of tricks that we need to start spreading the message about."

In November, Sideeffect undertook a course in Bunbury for apprentices at ABN group, including a drug education talk, and an assessment with a group of modules and questions related to synthetics drugs.

"It's been running for about a year, it's been road tested and it's different to other curriculums because there is a video that's very emotional that we show that's the story of Preston Bridge," he said.

"We're ready to get involved with other mining companies.

"We already do work with Rio Tinto, with

## THE SIDEFFECT STORY

Sideeffect is a not for profit organisation born from the tragic loss of 16-year-old Preston Bridge in 2013 when he jumped from a balcony after taking a synthetic drug known as 25iNBOME at his school ball.

The organisation was founded by Preston's father Rodney Bridge, along with former Eagles champion Chris Waterman and corporate businessman David Hobbs, with the aim to educate young people about the dangers of synthetic drug use.

"Sideeffect is the legacy of my son who lost his life at the age of 16 by making one uninformed decision," Mr Bridge said.

"Let's stop our kids from playing Russian roulette and arm them with knowledge."

In 2015, Mr Bridge infiltrated Chinese drug gangs exporting to Australia and saw firsthand the deadly ingredients used in the production of synthetic substances.

The dangerous stunt proved that large quantities of synthetic drugs could easily be smuggled into the country undetected by sniffer dogs.

Sideeffect believes education is key to putting a stop to Australia's synthetic drug problem, and is now ready to fill that void.

testimonials from them coming back very strong, and we would like the phones to ring for other people from mining and construction to get on board and give us a hand."

Sideeffect is also launching an Orange Card initiative that will be rolled out across Australian workplaces to ensure employees have a strong understanding of synthetic drugs and the negative effects on work and personal life.



More information can be found at [www.sideeffect.org.au](http://www.sideeffect.org.au).



# Coast-to-Coast growth

THERE is a maxim that states one should think globally and act locally. Australia's fastest growing haulroad management company, Dust-A-Side Australia has taken that tenet to the next level by thinking and acting globally, nationally and locally.

Capitalising on the success that its parent company Dust-A-Side has had on the world stage since 1973 – forging a formidable reputation at more than 70 open-cut and underground mine sites on four continents – Dust-A-Side Australia's progress since it entered the Australian market has been equally impressive.

Now with a strong presence from west to east coasts, the company has used its overseas experience and its equity relationship with Colas, the world leader in the construction and maintenance of roads, to create a service offering without peer.

Dust-A-Side Australia is now the only haul road management company in the country that can offer the Australian mining industry literally everything it requires.

## Unique full-service turnkey solution

Providing a holistic approach to haul road management, the company's full-service business model incorporates the manufacture, supply, installation, maintenance and management of haul road performance and dust control solutions.

This includes everything from fully trained personnel to industry-leading road



Dust-A-Side Australia delivers site-specific solutions across a broad range of industries.

stabilisation and dust suppression products, as well as plant and equipment, plus technology.

It's single-minded, 'one-source' approach helps Australia's mines enjoy unmatched economies of scale as they develop some of the nation's most productive haul road

running surfaces.

Dust-A-Side Australia's prowess in everything from road preparation and road establishment through to road maintenance and road monitoring has set the benchmark for successful road management.

It has been proven to deliver safer,

dust-free, all-weather haul roads that perform noticeably better, while reducing operating costs.

More information can be found on the Resources page at [www.dustaside.com.au](http://www.dustaside.com.au) by downloading the company's new *Haulroad Construction eBook*.

# The Claycrete (II) difference



More information can be found at [www.claycreteaustralia.com](http://www.claycreteaustralia.com).

MANY types of soils are high in clay content and typically not considered suitable for road construction.

Clay is prone to swell and shrink based on the absence or pressure of water and this has people avoiding the use of clay in construction.

An unstabilised road can unravel on the top creating a dusty, unsafe and loose surface during dry conditions and sloppy, unpassable surface during wet conditions.

Claycrete (II), as an ionic stabiliser, resolves this problem by altering the clay particles on a molecular level, permanently changing the clay into an environmentally friendly binder of soil

materials which no longer attracts water.

Long after the product has biodegraded, the clay remains in its stabilised state.

Claycrete (II) stabilises clay into an almost dustless, stronger, safer surface for all weather conditions.

One of the Claycrete Australia's recent projects in the City of Mandurah (pictured), substantially reduced construction costs and solved a tidal intrusion problem due to the high-water level.

The nuclear density test results show an average of 101.7 per cent of maximum dry density (MDD) which is well above average.



Claycrete (II) treated helipad and hardstands constructed with insitu soil, Western Australia.

## IONIC STABILISATION

**Claycrete (II), created in Perth (WA), is an environmentally friendly liquid additive that has been successfully performing ionic stabilising of clay gravel insitu soils since 1995.**

**Ionic stabilisation is a very efficient, low cost alternative to cement, lime, foam bitumen, pozzolan (e.g. fly ash), lignosulfonate (tree sap) and polymers.**

### BENEFITS OF CLAYCRETE (II)

- Environmentally friendly (harm free)
- Economical (maximum of \$1 per m<sup>2</sup>)
- A 200 litre drum of Claycrete replaces up to 45 tonnes of cement
- Reduces maintenance and construction costs
- Withstands all weather conditions

### USES OF CLAYCRETE (II)

- Dust Minimisation
- Sub base and or base stabilisation of:
  - Mine and haul roads
  - Sealed and unsealed roads
  - Hardstands
  - Runways and helipads

**FOR MORE BENEFITS AND USES OF CLAYCRETE (II) VISIT [www.claycreteaustralia.com](http://www.claycreteaustralia.com)**

Barry Goodsell  
[barry@claycreteaustralia.com](mailto:barry@claycreteaustralia.com)  
0418 935 494  
[www.claycreteaustralia.com](http://www.claycreteaustralia.com)





# Australia's only full-service, truly national, turnkey Haul Road Management solution.

**If you're looking for the total mine haul road management solution, all roads lead to Dust-A-Side Australia.**

We offer you everything you expect from a dedicated mine haul road management company.

## Global Scale

A proven global supply chain guaranteeing continuity, unbeatable economies of scale plus an unmatched logistics capability; leveraging off our dynamic parent company – Colas – who are world leaders in the construction and maintenance of roads.

## Longevity

Dust-A-Side has been one of the world's largest providers of haul road and dust control management solutions since 1973, having accumulated more than 500 years of combined project experience and learnings.

## Experience

We have been the partner of choice at over 70 open-cut and underground mine sites across 4 continents, making us a global leader in the industry.

## Full Service

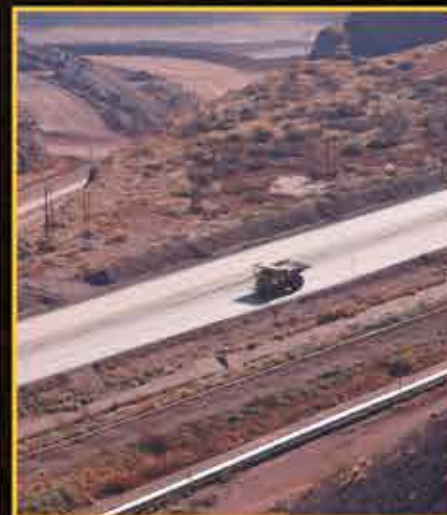
We do far more than merely sell dust suppression products; we manufacture, supply, install, maintain and manage haul road performance and dust control solutions.

## National Support

Our flagship road stabilisation and dust control product is manufactured in Perth, Brisbane, Sydney & Melbourne, and delivered in bulk to mine sites across the nation in order to offer unparalleled cost efficiency.

## Proven to Perform

Our expertise flows right through to Road Preparation, Road Establishment, Road Maintenance and Road Monitoring...resulting in safer, dust-free, all-weather performance and lower operating costs.



Call **1800 662 387** for more information or to arrange a Free On-Site Inspection. [australia@dustaside.com.au](mailto:australia@dustaside.com.au) / [www.dustaside.com.au](http://www.dustaside.com.au)

 **DUST-A-SIDE<sup>®</sup>**  
AUSTRALIA



# Improving haul road performance



Proof Engineers civil engineer Jordan Handel with a Road Condition Monitor (left) and Dustective (right).

NEW cutting-edge innovations by Queensland-based engineering company, Proof Engineers, are revolutionising the way haul and mine roads are constructed and maintained.

With growing pressures on mine operators to look for ways to save costs and improve performance, Proof Engineers has designed systems which require minimal investment and provide a clear picture of where the roads are responding poorly to

the trucks.

The Proof Road Condition Monitor (RCM) is an easy and affordable truck-on-board haul road monitoring system that provides a real-time snapshot on how the mine truck responds to road conditions.

Dustective is a real-time mobile dust monitor, which accurately measures dust generation from various sources, providing quantifiable data to demonstrate compliance with strict industry air quality regulations.

The focus for Proof Engineers is on an industry standard applications — easy for the mining industry to use and integrate within their existing operating conditions.

Proof Engineers civil engineer Jordan Handel said RCM and Dustective aid in maintaining optimum road conditions on an ongoing basis, ensuring haulage is carried out in a safe and cost-effective manner.

“Poorly maintained roads cost a site time and money in terms of production, resulting

in a range of issues including increased rolling resistance, damaged machinery and dust generation,” Mr Handel said.

“These systems are user-friendly, non-invasive, require minimal training and can be rolled out on site with minimal effort.”

More information on Proof Engineers haul and mine road monitoring solutions can be found at: [www.proofengineers.com.au](http://www.proofengineers.com.au) or by calling (07) 5522 0855.



## GOT DUST? WE FIX IT

Improve haul road running surfaces and minimise maintenance by increasing strength, functionality and drainage properties with RST's extensive range of dust suppressants and soil stabilisers, customised to your site's unique needs. RST develops tailor-made solutions from their suite of products and customised mechanical equipment to service all facets of the supply chain and maintain durable, high-quality haul roads into the future.

For higher quality roads, lower operation costs, reduced water usage and less fuel consumption turn to RST to get the right solution for your site.



- > Road recovery
- > Dust suppression
- > Tested and proven results
- > Greatly reduce haul road dust and save water
- > Less dust, less water, less maintenance
- > Easy application procedures for immediate results
- > No extra infrastructure or road reconstruction
- > Get instant results using minimal product
- > Environmentally safe

- OUR PRODUCTS – ADVANCED FORMULAS, ENVIRONMENTALLY SAFE:**
- > **RT20 Dynamic:** Compact roads faster using less water, increases road building material density and strengths.
  - > **RT9 Dynamic and Kickstart:** Improve water penetration, bind fine dust particles and consolidate haul road surfaces. 'Superboost' with Kickstart.
  - > **Shield AWR:** Minimise ongoing maintenance by using during construction and apply to existing pavements to rejuvenate and make them dust free.
  - > **Avenger and Boost X:** Improve the road structure to reduce roll resistance, road maintenance and road recovery after rain. 'Superboost' with Boost X.

1300 GOT DUST (1300 468 3878)  
[info@rstolutions.com.au](mailto:info@rstolutions.com.au)  
[www.rstolutions.com.au](http://www.rstolutions.com.au)





# Trusted tarpaulins specialists

DARLING Downs Tarpaulins (DDT) was established in 1982 and has been supplying the resources sector for more than 30 years.

The family-owned company has a large production facility in Toowoomba, with the capacity to produce large, purpose-built tarpaulins and shade cloth products.

"Our experienced staff utilise the latest machinery to produce quality products from the best fabric available," DDT managing director Michael Ryan said.

"From large, temporary floating covers to dam liners, DDT is capable of customising products to suit almost any requirements."

DDT has extensive experience in stockpile tarps as well as any heavy duty, custom made tarpaulins.

"We have just finished a project in Brisbane, fabricating scour mattresses for roadworks along the river bank," Mr Ryan said.

"We have also developed an insulated, anti-concrete PVC that has been designed to handle steam, concrete curing of products such as railway sleepers and bridge pylons.

"The fabric has a special plasticiser that resists the premature breakdown which is common in standard PVC."

DDT have also added an insulating foam to enhance the heating capability.

More information can be found at: [www.ddt.com.au](http://www.ddt.com.au).



DDT has the expertise to carry out all tarpaulins jobs, big or small.

## Australian manufacturers of quality canvas, PVC and poly products.

Servicing Australia-wide.

- Australian made heavy duty tarpaulins
- Dam liners
- Floating covers
- Stockpile tarps
- Onsite welding habitats
- Custom made products
- Concrete curing tarps



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

33 Industrial Ave,  
Toowoomba QLD  
(07) 4634 2166  
[ddt@ddt.com.au](mailto:ddt@ddt.com.au)



Darling  
Downs  
Tarpaulins



# Flexible industrial tarps

FLEXIMAKE is a leading manufacturer of products to the mining industry, with a focus on using flexible materials as an alternative to solid and, at times, costly products.

The company has manufactured many products such as tank and dam liners, large liquid storage, inflatable pipe plugs, large tarpaulins, grain covers and stockpile covers for a variety of different companies in the mining space.

Manufactured in the heart of Melbourne, Fleximake tarps are meticulously produced to the highest standards.

The specialised industrial tarps and covers are purpose-made to suit each clients' requirements, and use a number of different grades and materials from PVC, PE, PP and TPU materials which are 100 per cent waterproof, tear resistant and UV stabilised to suit each application.

Flximake also manufactures inflatables, liquid/tank liners, inflatable pipe plugs, and large capacity liquid bladders/frack tanks using industry standard materials to specifically fit and suit individual requirements.

Working with industrial clients in Australia and around the world, Fleximake's team has many years of experience in the industrial textile and manufacturing industry and is available to work with customers throughout the manufacturing process.

The company works closely with clients to thoroughly iron out all specific details of their requests.

All manufacturing is done in Australia.



**Fleximake tarps are custom designed to meet clients' needs.**

using state-of-the-art seam welding techniques (both hot air and high frequency) with much of the material sourced locally or from Australian suppliers.

Fleximake strives to keep Australian manufacturing's high standards alive with its quality products.

All products go through rigorous testing

and quality assurance before they are the despatched and delivered.

More information can be found at:  
[www.fmindustrial.com.au](http://www.fmindustrial.com.au).

THE AUSTRALIAN  
MINING REVIEW

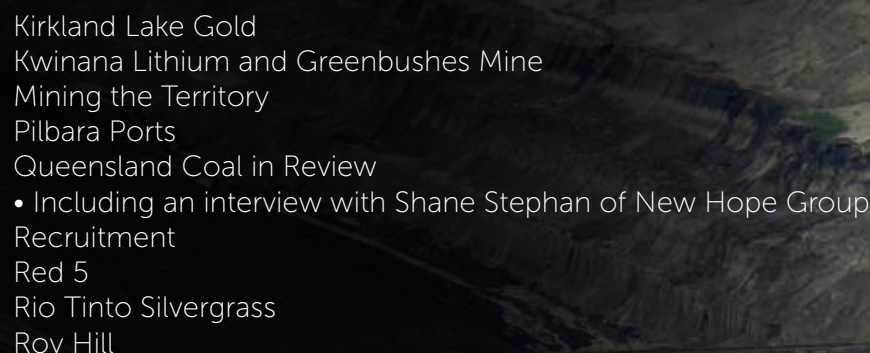
# FEATURES

---

FOR

---

# JANUARY 2018






Kirkland Lake Gold  
 Kwinana Lithium and Greenbushes Mine  
 Mining the Territory  
 Pilbara Ports  
 Queensland Coal in Review  
 • Including an interview with Shane Stephan of New Hope Group  
 Recruitment  
 Red 5  
 Rio Tinto Silvergrass  
 Roy Hill

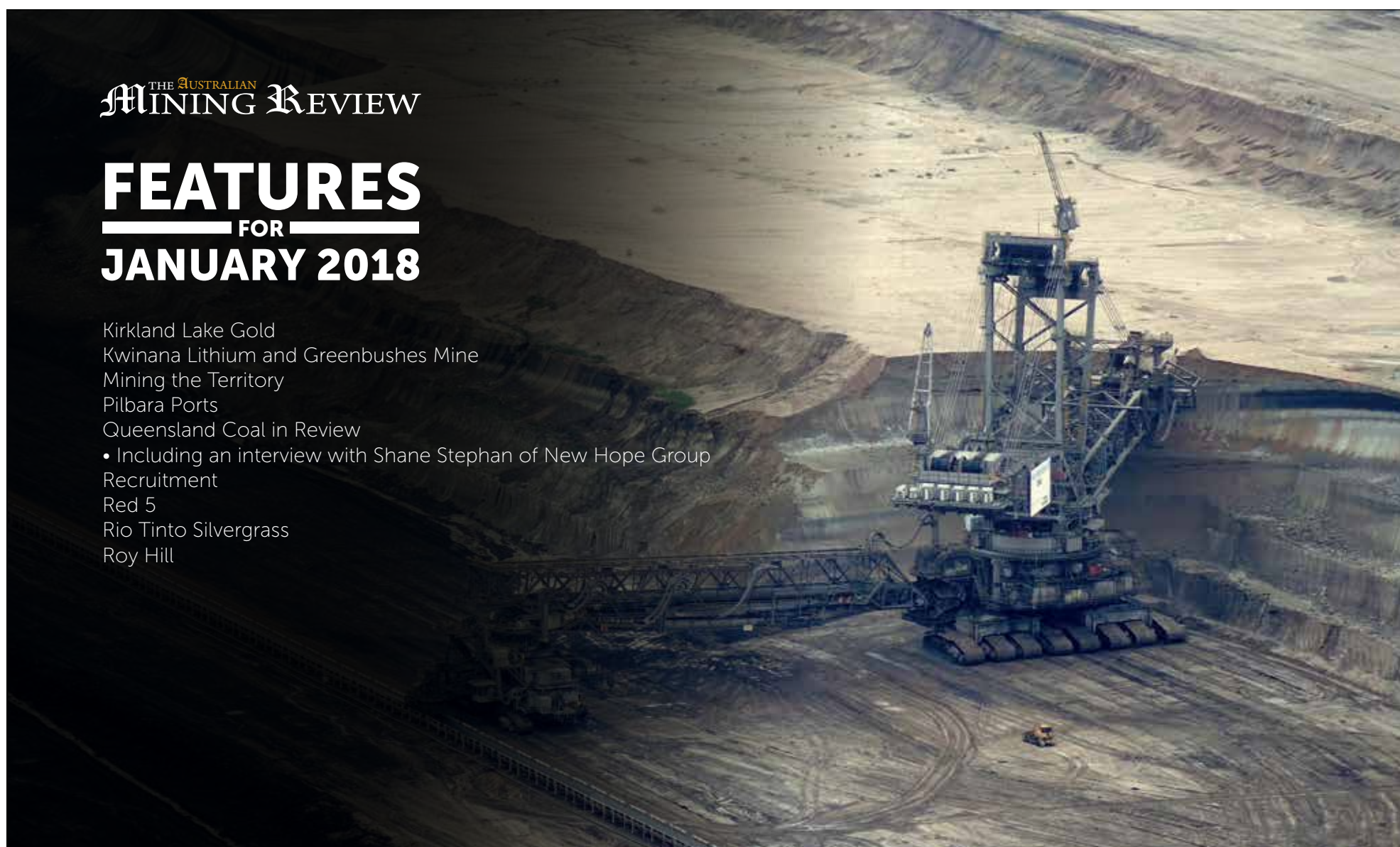
**CALL US** TO BOOK YOUR PLACEMENT TODAY

BOOKING DEADLINE: **December 1st 2017**

## BRAD FRANCIS

 (08) 6314 0303       0405 345 312

 [brad@miningoilgas.com.au](mailto:brad@miningoilgas.com.au)





# METS

## UNDER THE MICROSCOPE

Australia's resources industry is world-renowned for its size, scope and competitiveness. METS Ignited – an industry-led Growth Centre supported by the Australian Government – recently completed research into the significant contribution made by the mining equipment, technology and services sector.

Image: METS Ignited.

### CAMERON DRUMMOND

AUSTRALIA has seen an unprecedented increase in mining capacity over the last decade.

On the back of the construction boom, production has doubled for thermal and metallurgical coal, bauxite, and alumina, and tripled for iron ore.

The nation has also assumed the mantle of leading lithium producer, and has seen a 30 per cent increase in aluminium production.

In the background, Australia's METS industry has not only kept pace – it has thrived.

The sector is driving new approaches to help deliver enormous productivity improvements across all commodities. In the process it is establishing a global reputation for innovation.

In a landmark report, *The Australian METS Sector – its Economic Contribution and Demographics*, METS Ignited has taken the first steps to quantify – year-on-year – the size, scope, and demographics of this highly innovative sector of the economy.

The findings offer a deep insight into one of Australia's most advanced and complex industries.

### METS at a glance

The report defined the Australian METS sector as consisting of the supply of goods and services to the mining extraction industry:

- from both direct and indirect suppliers
- both specialised and non-specialised goods and services
- to both Australian mining extraction and exports to foreign mining extraction industries.

The definition excluded supply to the oil and gas industry and supply to minerals processing, except where basic processing occurs at the mine site.

The overall Australian METS sector generated \$86.2 billion gross value add (GVA) – or five per cent – to the Australian

economy in 2014-15.

While the sector peaked at \$128 billion GVA at the top of the construction boom, it has continued to grow, almost doubling in size from the estimated \$44 billion GVA in 2005-06.

Today, the METS sector supports over half a million local jobs, and the industry continues to build with a sustained average growth of close to seven per cent (Trading Economics, 2017), far outstripping the average growth of the Australian economy.

*The Australian METS Sector* report provides a clear, industry-led distinction about the nature and types of companies that are considered within the METS industry.

The report represents a significant leap in formalising the sector to tailor policies and actions towards a defined and quantifiable group of companies.

### METS industry segments insights

The 'specialised METS sector' represents \$43.3 billion of the \$86 billion and the balance \$42.9 billion is represented by the non-specialised services required by the industry.

The figures are an important reminder that while the mining operations are a powerful driver of economic wealth, the flow-on effects are far more than tax revenue and commodity exports. Mining has the power to spark an entire industry, giving opportunity to METS companies to continue to develop innovative solutions that not only support local industry but in fact become significant growth export opportunities.

*The Australian METS Sector* report identifies that there are nine industry segments, which encompass at least 40 subindustries that provide specialised goods and services to the mining industry – each one vital to major projects. The list of subindustries is diverse, covering everything from water supply to construction services, equipment hire and training, and software development. While construction represented the largest contributor on a \$GVA basis at \$8.1 billion

in 2014-15, it also reflects the largest volatility in the sector.

The construction segment GVA peaked at \$17.1 billion in 2011-12.

There has been enormous growth in the professional and technical services segment. This sector is 2.6 times larger than in 2005-06, with jobs growth from 25,000 to 68,000.

All of the growth development segments are leveraging innovation, leading-edge technologies and are global exporters.

This group also has enormous export potential and growth opportunities. While they benefited from the feasibility, design and construction boom, these sectors delivered a net 94,000 new jobs between 2005-06 and 2011-12.

Construction-related jobs, on the other extreme, have more than halved since the peak of 2011-12, reaching 93,000. Construction over the same 2005-06 to 2011-12 has nevertheless delivered 15,000 extra jobs growing from 28,000 to 44,000.

Of importance to the Australian economy are exports emerging from the basic equipment manufacturing segment.

Large amounts of non-ferrous metal manufacturing are assisting the segment to account for approximately 19 per cent of all METS industry exports.

Basic equipment manufacturing is closely followed by the transport industry segment. Rail and road transport products and services assist the segment in contributing 14 per cent of the METS industry's exports.

The findings in the report are critical to understanding and continuing support in the METS sector. Through the provision of better quality and regular information, METS Ignited is able to establish an accurate portrayal of the industry, helping quantify the impact of growth measures and providing evidence where necessary when growth is not as strong as predicted.

In addition, through identifying industry segments and subsectors, it is possible to develop approaches to align various and radically different stakeholders to garner different perspectives on innovation and collaboration.

## INDUSTRY SEGMENTS

### CONSTRUCTION

Segment size (\$GVA):

**\$8.1 billion**

Jobs: **44000**

### PROFESSIONAL AND TECHNICAL SERVICES

Segment size (\$GVA):

**\$8.0 billion**

Jobs: **68000**

### TECHNICAL EQUIPMENT MANUFACTURING

Segment size (\$GVA):

**\$6.9 billion**

Jobs: **58000**

### CONTRACT MINING (INCLUDING EXPLORATION)

Segment size (\$GVA):

**\$5.5 billion**

Jobs: **36000**

### TRANSPORT SERVICES

Segment size (\$GVA):

**\$4.4 billion**

Jobs: **28000**

### BASIC EQUIPMENT MANUFACTURING

Segment size (\$GVA):

**\$3.6 billion**

Jobs: **31000**

### WHOLESALE TRADE

Segment size (\$GVA):

**\$3.6 billion**

Jobs: **23000**

### ICT SERVICES

Segment size (\$GVA):

**\$1.6 billion**

Jobs: **8000**

### OTHER SERVICES

Segment size (\$GVA):

**\$1.5 billion**

Jobs: **18000**



# Technology that works

DEVELOPED by Schenck Process, the global experts in vibrating equipment, CONiQ® is the condition monitoring solution specifically designed for vibrating machines and is based on the latest sensor technology and analytical software.

Effective condition monitoring makes it possible to detect potential future faults long before they happen and allows the site to undertake maintenance interventions at precisely the right moment.

Schenck Process Australia, with the assistance of its dedicated personnel and customer collaborations, is successfully replacing former technology with the CONiQ®.

Customer site trials have been the key to the CONiQ® success story, allowing it to collect valuable data first hand and make real-time modifications.

Schenck Process Australia's very first site trial began on the 10 April 2015 for a major iron ore mine site in the WA Pilbara.

The CONiQ® was installed on a product screen and feeder and crusher feeder.

The support Schenck Process received from its customer for the new unconfirmed monitoring product was immense.

Through knowledge gained, CONiQ® underwent further software upgrades at the trial site.

CONiQ® is now installed and running without any known issues on 26 machines consisting of 8 product screens, 8 product feeders, 6 scalpers and 4 crusher feeders.



Schenck vibrating machine monitors have been installed at world-class mine sites around Australia.

CONiQ® was also installed at Newmont's Boddington gold project, and is performing well.

On both sites the CONiQ® has detected many early exciter failures, allowing enough time to plan for replacement and avoiding the urgency of unplanned

failures.

Within a short period of installation, CONiQ® picked up many speed anomalies with two EPS faults and one exciter failure.

Normally these issues would go undetected without intelligent condition monitoring systems and unplanned

failures would occur.

"Newmont Boddington Gold (NBG) has installed Schenck Process CONiQ® vibration monitoring to 15 of our Schenck Process banana screens models SLO3680W and SLO3673D," Newmont Boddington mechanical engineer Steve Barnett said.

The first unit was commissioned into operation in early 2016 and is still in service.

"The CONiQ® hardware is robust, which performs in the harsh mining duty and high cycle fatigue application," Mr Barnett said.

"In particular, the design layout of the cables and conduit performs exceptionally well compared to previous designs.

"The system has detected various faults including exciter bearing defects, intermediate shaft coupling damage, worn drive belts and incorrectly sized pulleys.

"Information is monitored using a Profibus interface to plant control system, which Newmont engineers use to assist with preventative maintenance tasks and to avoid unplanned outages."

Testimonials from customers allows Schenck Process to fulfil its global corporate value of "inspiring its customers" by doing all it can to optimise processes, results, support where customers need it most, and assume responsibility for their entire life cycle of products.



## The power to predict



Schenck Process Australia Pty Ltd  
Ground Floor, 85 Epping Road,  
North Ryde NSW 2113, Australia  
T+ 61(0)2 98 86 6800  
sales@schenckprocess.com.au  
www.schenckprocess.com.au



CONiQ® from Schenck Process offers distinct advantages as a condition monitoring system specially designed for vibrating machines, with a unique six-dimensional vibration measurement.

With CONiQ®, Schenck Process consolidates its position as a provider of intelligent Industry 4.0 applications.

**Maximum uptime. For a lifetime.**  
CONiQ® condition monitoring in mineral processing



# Innovative software solutions

MICROMINE is a leading provider of innovative software solutions that span the breadth of the mining cycle from geological exploration and data management, to resource estimation, 3D mine design, planning and production control.

Founded more than 30 years ago, MICROMINE solutions are used at more than 2000 sites in more than 90 countries.

Renowned for its ease of use yet powerful capabilities, MICROMINE's software can maximise customer asset value, increase productivity and be utilised for decisions on which they know they can rely.

All products are available in numerous languages and supported by local experts.

MICROMINE offers three market leading products to assist mining companies increase production and performance, improve efficiencies and reduce costs.

## Micromine

Micromine is a comprehensive and easy to use exploration and mine design solution, which offers integrated tools for modelling, estimation, design, optimisation and scheduling.

It provides users with an in-depth understanding of their projects, so prospective regions can be targeted more accurately, increasing the chance of a project's success.

Miners are provided with interactive



MICROMINE software solutions assist mining companies increase overall efficiency.

and easy-to-use modelling, estimation, and design tools to simplify their day-to-day design and production tasks.

## Geobank

Geobank is a secure and flexible data management system to protect an

organisation's most valuable asset – data.

The scalable software solution delivers market leading geological data management capabilities across a range of environments.

## Pitram

Pitram is a fleet management and mine

control solution that records, manages and processes mine site data in real-time.

As a scalable solution, it is suitable for underground and surface mine construction, development and production.

Pitram records data related to equipment, personnel and materials, providing an overall view of the current mine status and therefore enabling improved control over operations.

Greater control allows sites to increase production, reduce costs, and improve safety and business intelligence.

## Recent activities

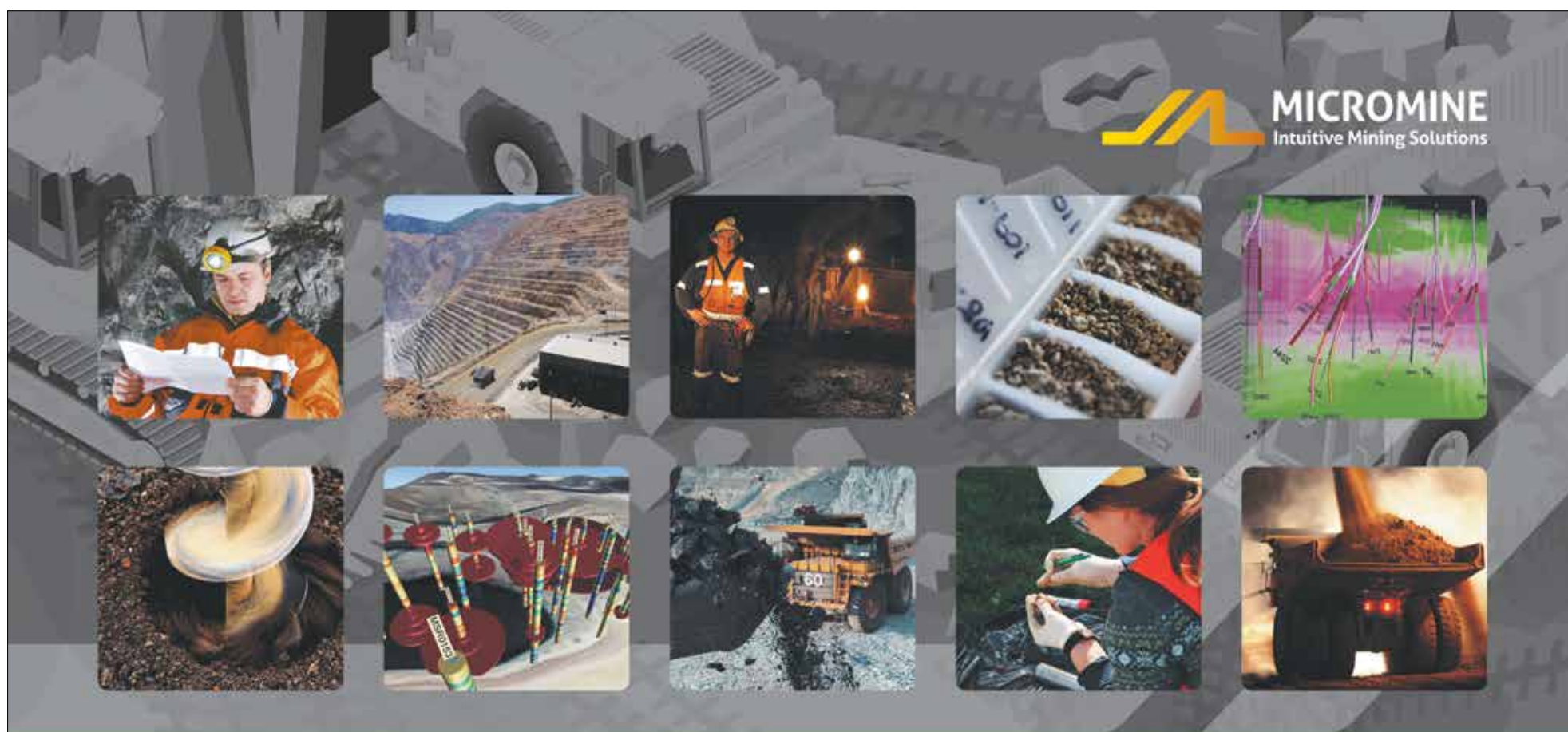
Recently, MICROMINE successfully implemented its leading underground fleet management and mine control solution, Pitram, at Dugald River, in north-west QLD.

MMG's Dugald River mine has one of the world's highest-grade known zinc deposits, supporting a 1.7mtpa operation with annual production of around 170,000 tonnes of zinc concentrate per annum.

The successful implementation of Pitram enables the control room administrators to capture live data ensuring data accuracy, increasing efficiencies and control over equipment, tasks and personnel.

"We are very excited to have implemented Pitram at Dugald River," MICROMINE Pitram Product Strategy manager Gareth Dean said.

"Pitram will provide MMG with an overall view of the current mine status, therefore enabling more control over the operation."



MICROMINE is a leading provider of innovative software solutions that span the breadth of the mining cycle from geological exploration and data management, to resource estimation, mine design, planning and production control.

Customers use MICROMINE software to maximise their asset value, increase productivity and for decisions on which they know they can rely. Our software is renowned for its ease of use yet powerful capabilities. All products are available in numerous languages and supported by local experts. Founded 30 years ago, MICROMINE solutions are used at more than 2,000 sites in over 90 countries.

T: +61 (0)8 9423 9000 E: [marketing@micromine.com](mailto:marketing@micromine.com) [www.micromine.com](http://www.micromine.com)

**G** Geobank

**M** Micromine

**P** Pitram



# POWERING THE MINES OF TOMORROW

Mining companies are increasingly turning to renewable energy as a solution to escalating power costs across their operations.

The Lakeland Solar and Storage Project in far North Queensland.  
Image: Conergy.

## ELIZABETH FABRI

THE rise of renewable energy in mining was a key theme of the 2017 International Mining and Resources Conference (IMARC) held in Melbourne early November.

The Future Energy-Australia portion of the conference included discussions on financing renewable energy projects for mines, solar and storage as an increasingly affordable and viable energy solutions, reshaping solar to meet the mining sector's needs, and off grid and micro grid infrastructure opportunities.

Australian Solar Council chief executive John Grimes, who presented at the conference, said solar photovoltaics were now the cheapest way to generate electricity, with prices globally as low as \$22 per megawatt hour.

"In an Australian setting, around \$50 per megawatt hour is more realistic," Mr Grimes said.

"Electricity generated by diesel generators is well above \$300 per megawatt hour, (with some as high as \$600 per megawatt hour).

"Combining solar PV with battery storage, mine sites can access secure, reliable power at a fraction of the cost of diesel generation."

Mr Grimes said mine sites in Australia and around the world, were typically combining solar PV, battery storage with existing diesel generators.

"Solar is also being used across accommodation, portable lighting, remote monitoring sites and elsewhere as a cheaper alternative to installing transmission lines," he said.

"Another big opportunity for Australian mining is the global boom in lithium-ion batteries.

"With 33 per cent of global reserves of lithium located in Australia we may soon see lithium exported from Australia turned into batteries that in turn power the mine sites of the future."

Sandfire Resources, for example, was one of the first movers in Australia to use renewable energy in an off-grid mining application.

**"Combining solar PV with battery storage, mine sites can access secure, reliable power at a fraction of the cost of diesel generation."**

Image: Sandfire Resources.

Its WA DeGrussa mine is home to a \$40 million solar project comprising 34,080 solar PV panels spanning more than 20 hectares.

The panels are connected to a 6MW lithium-ion battery storage facility and the existing 19MW diesel-fired power station at DeGrussa via an extensive network of low-voltage, high-voltage and communication cables.

The solar project supplies about 20 per cent of the annual power requirements of the DeGrussa mine and cut its emissions by about 12,000 tonnes of carbon dioxide a year.

Horizon Power managing director Frank Tudor, who also spoke at Future Energy-Australia, said the uptake of new technologies was putting commercial and industrial consumers at the centre of the electricity market, but adding a level of complexity which was hard to manage for industrial customers.

"It's hard for the mining and resources

industry to keep track of the disruptions occurring in the energy market and to manage the policy uncertainty," Mr Tudor said.

"The mining industry wants reliable, affordable and sustainable energy to power their operations, and the declining cost of renewables has been seen as the key to managing this conundrum.

"Yet retail prices keep going up, as our regulatory and policy frameworks are struggling to keep pace with the innovations in technology.

"We forecast distributed energy resources will become the main source of energy in the future, so the need for flexibility and innovation is critical at this point in time."

Mr Tudor said micro grids were self-sufficient electricity networks that could be embedded in, or be remote from, a larger network.

These grids enable distributed energy resources, like solar panels and batteries that are located away from a central power station, to feed into the network.

"Microgrids are a means of getting the most out of all manner of distributed energy resources, and when integrated properly, unlock the potential for technological advances, cost-saving measures, and more renewable and environmentally-friendly energy options in the network," Mr Tudor said.

## PROJECT IN FOCUS

### Lakeland Solar and Storage

Australia's renewable energy industry is growing at a rapid pace, yet there are still knowledge gaps when it comes to large-scale solar PV and battery storage servicing fringe-of-grid regions.

Conergy's \$42.5 million Lakeland Solar and Storage project in far North Queensland is currently testing a number of battery operation modes and will share lessons learnt with industry partners.

While not located on a mine site, the project is the first Australian utility-scale solar and storage facility built on the outskirts of the electricity grid; an area typically prone to energy reliability challenges.

It comprises a 13 megawatt (MW), 41,440 panel solar array; 1.4MW lithium-ion battery storage capable of delivering up to 5.3 megawatt-hours (MWh) of energy; and a smart system controller to facilitate consistent power supply for the Lakeland community.

Conergy's Knowledge Sharing Program (KSP) will share potential learnings with project stakeholders, the Australian Renewable Energy Agency (ARENA), mining giant BHP, Ergon Energy and Origin Energy who will be buying power from the plant.

Conergy managing director Christopher West said the company was "very pleased" that BHP was taking an active part in the Lakeland Solar and Storage KSP to further investigate the use of reliable renewable energy technologies as part of their operations in remote and off-grid mine sites.



## RELIABLE ENERGY FOR MINING

Power that Goes Above and Beyond — Even Underground



GNB® Industrial Power - a division of Exide Technologies operates in more than 80 countries, has the products and services to meet the world's stored energy needs in the industrial markets. With more than 120 years in the battery business, Exide has the experience, advanced research and development capabilities and knowledge to provide solutions to various stored energy requirements. Network Power installations include standby power for utilities; telecommunications; oil and gas off-shore platforms; renewable energy; railway systems and uninterruptible power supply (UPS). A safe and solid uninterruptible power supply is the key component in mining as it is one of the most challenging work environments. The well-known Sonnenschein, Marathon and Absolyte batteries from GNB® Industrial Power ensure a reliable and optimized energy supply for your application.

Sales inquiries e-mail: [networkpower@ap.exide.com](mailto:networkpower@ap.exide.com)  
 Direct e-mail: [jo.volpe@ap.exide.com](mailto:jo.volpe@ap.exide.com)  
 Phone Inquiries: 08 6188 8005

[www.gnb.com](http://www.gnb.com)



**GNB®**  
 INDUSTRIAL POWER

## RELIABLE ENERGY STORAGE

Large- and small-scale storage solutions for renewable energy

### A GLOBAL LEADER IN RENEWABLE ENERGY STORAGE SOLUTIONS

GNB® Industrial Power – a division of Exide Technologies is a global leader in renewable energy storage with strong capabilities in both large- and small-scale storage of renewable energy. GNB's aim is to create storage solutions for grid-connected wind and solar farms, and large commercial and industrial installations.



Sales inquiries e-mail: [networkpower@ap.exide.com](mailto:networkpower@ap.exide.com) | Direct e-mail: [Jo.volpe@ap.exide.com](mailto:Jo.volpe@ap.exide.com)  
 Phone Inquiries: 08 6188 8005 | [gnb.com](http://gnb.com)

**GNB®**  
 INDUSTRIAL POWER



# Thriving on solar innovation

FOR more than 18 years, Outback Energy Supply has provided solar solutions to the mining and associated industries.

The company's vision has been to supply and deploy innovative renewable energy powered solutions to reduce cost noise and pollution for its diverse client base.

Outback Energy Supply provides solar-powered pumps up to 45kW, and solar generated power for communications infrastructure, mining camps, lighting and a range of remote area, off-grid renewable solutions.

From 120kW grid connect systems at Kalgoorlie Airport, to one or two panel communications or flow metering jobs, Outback Energy Supply has reduced diesel costs and greenhouse gases for clients across WA and beyond.

Outback Energy Supply's team takes immense satisfaction when they shut down or drastically reduce another diesel genset's operating hours, or negate the need for costly power line infrastructure.

Solar is well proven to reduce the cost of diesel generation in terms of fuel and man hours spent on diesel maintenance and servicing, and with modern communications, the assets are able to be remotely monitored for efficiency and maintenance.

Outback Energy Supply's rapidly deployable containerised arrays and systems use lithium battery technology to keep the system size down and are available for capital purchase or leasing.



The cost of solar cells has rapidly decreased in the last 10 years.

# Solar SOLUTIONS

**WE SUPPLY**

- Readily Deployable Solar Power
- Fixed Solar Arrays
- Battery Systems
- Diesel Gensets
- Fully Integrated Systems
- Solar Carports
- Solar Water Pumping

**OUR SERVICES**

- Electrical Contracting EC 5698
- Renewable Power Infrastructure
- Battery Maintenance including Mill Tripping Supplies
- Solar Water Pumping Projects up to 45kW 3 Phase
- Diesel and Battery Backup
- Small One Panel Systems
- Full Minesite Capable Systems
- Remote Monitoring

**OUR CORE PRODUCTS ARE OUR ENERGY SOLUTIONS, TO DISPLACE OR REDUCE DIESEL GENSET EMISSIONS.**

From pumping water, powering remote or installing satellite facilities, our solar systems can reduce the power requirements and diesel use of any application.

**outbackenergy.com.au**

☎ 08 9093 0060 ✉ solar@outbackenergy.com.au



# Mining's emergency response specialists

THE Corporate Protection Australia Group (CPA Group) is one of the largest private safety and emergency response companies in the southern hemisphere.

Its key individuals and associates have a sound history of successfully negotiating rigorous, high-profile environments and situations.

CPA Group offers a wide range of services; encompassing security, health and medical, fire rescue, consultation and training.

It services major clients in the mining, oil and gas, energy, critical infrastructure, construction, and maritime industries – on time, and on budget.

The company's operational model places safety at the forefront of all activities, with a strong safety culture that starts from the top.

CPA Group executive chairman Harley Sparke is dedicated to safety, and ensures this passion governs every undertaking, no matter how small; a commitment that goes hand in hand with its exemplary safety record.

Through ongoing, proactive mitigation and management, CPA Group works alongside its clients to tailor services to specific requirements.

The organisation is well-placed to provide



Results, efficiency, and loyalty are what drive The Corporate Protection Australia Group.

highly efficient, cost-effective solutions, with cross-trained professionals that cover all appropriate combinations of security, medical, and emergency service skillsets.

CPA Group paramedics and nurses are trained in emergency rescue; emergency services officers are trained medics; and

security guards can provide first aid and form part of the emergency response team.

The chief point of difference is that, as well as offering a unique and all-encompassing suite of services, CPA Group allows its clients to select packages of services tailored to their specific needs, thus

achieving high-quality solutions at the right price point.

This model originates from an analysis of best practices that have been developed by the company over years of working in some of the harshest, most remote environments all over the world.



Training



Protecting your people,  
assets and business



Security



Fire & Rescue



Health & Medical



Consultancy



# DRIVEN BY YOU

## Heavy Duty Sweeping & Scrubbing Equipment

- 💰 **Reduce cost to clean** with innovative cleaning technologies
- 🔴 **Dust and debris control** with high-performance sweepers and scrubbers
- ⬆️ **Maximise productivity** with robust equipment that is reliable & easy to operate
- ⊕ **Maintain health and safety** with high-traction certified technologies

Call **1800 226 843** (FREE CALL) and quote this promo deal for more info:

**SAFE1AmR\***

[TENNANTCO.COM.AU](http://TENNANTCO.COM.AU) 🔍

\*Terms & conditions apply. © 2017 Tennant Company. All Rights Reserved



# Dust and debris control facilitator

TENNANT Company is a world-leading manufacturer of award-winning indoor and outdoor industrial cleaning equipment chosen by blue chip mining organisations to maintain efficient, safe and healthy assets and workplaces.

Challenging environments like mine sites, wharfs and heavy vehicle workshops demand robust, heavy duty cleaning solutions.

With its extensive line-up of mining/heavy industry machinery, Tennant delivers on economic productivity and WH&S efficiencies.

As ever-more stringent protocols are implemented that are designed to keep workforces safe and minimise environmental impact – all while maximising profit – demand has never been higher for equipment that ticks all these boxes and manages to exceed expectations.

## Dust control and sweeping

“Our mining industry customers deploy Tennant’s Sentinel® High-Performance Rider Sweeper for their wharf operations,” Tennant national sales manager Adam Esho said.

“The extreme levels of dust and other pollutants are simply no match for the Sentinel® which is valued for its four-wheel power steering, tight turning circle and manoeuvrability to access between stock piles, without impeding traffic.”

The Tennant 800 Industrial Ride-On Sweeper is another popular unit used by customers in the mining industry.



Tennant has extensive industrial scrubbing and sweeping products to suit any application.

It maximises cleaning productivity with its wide cleaning path, large capacity hopper and operator-friendly features.

Capable of capturing cement dust to heavy debris, its heavy-duty steel construction and high-performance dust containment make it ideal for harsh environments.

For smaller-scale applications, Tennant offers a line of Compact Ride-On Sweepers including the 6100, 6200 and S20, variously used by mining enterprises of all sizes as well as partnered logistics firms.

Designed for optimal manoeuvrability

combined with high efficiency, single-pass sweeping and multiple-stage dust control systems, each model offers its own specific additional attributes.

Heavily supplied into mining workshops is the S10 Walk-Behind Sweeper which capably does round-the-clock battle with copious work bay dust.

## Scrubbing

Industrial scrubbers don’t come tougher or more versatile than Tennant’s range of Walk-Behind Scrubbers.

Considered an essential in any efficient

mine site or workshop, large or small, the 5700 Walk-Behind Scrubber delivers up to 136kg of down pressure.

It is robust, reliable and uses up to 70 per cent less water thanks to Tennant’s innovative ec-H2O™ technology.

Tennant T16 and T12 models are used in an array of applications including medium sized warehouses and large light vehicle and utility workshops where ride-on machines are a must to get the job done quickly and often.

## Sweeping/scrubbing

Where large quantities of wet debris, dirt and oils need to be cleaned up rapidly and completely, Tennant’s line-up of Sweeper-Scrubbers are infinitely up to the task.

The M20 cleans up to three times longer than conventional scrubbing by using less water and single-pass efficiency.

The 8300 Battery Powered Ride-On Sweeper-Scrubber for larger hub warehouses offers a super clean in one action and fume-free operation with continuous battery power capacity of up to 1000 amp hours.

## TennantTrue® Direct-To-You Service & Maintenance

Tennant’s onsite service and maintenance program, TennantTrue® is the gold standard in the industry.

Company-trained field technicians carry all parts on board and are fully versed in the operation, repair and maintenance of all Tennant equipment, guaranteeing minimal downtime.



# A comprehensive range



More information can be found at: [www.waropes.com.au](http://www.waropes.com.au).

ESTABLISHED in 1995 in Perth, WA Ropes & Hardware is one of the country's largest and most diverse suppliers of ropes, cords, twines.

The rope and cordage importer and distributor's product range encompasses polypropylene rope, sisal and manila rope, silver rope, PE mono rope, dyneema, cotton rope, double braid, lead core line,

VB cord, abseiling rope, shock cord, cotton polypropylene and jute twines and tarred marline.

Seven years ago, WA Ropes & Hardware also branched into cyclone net, rope nets and rope ladders.

The company stocks cyclone nets with rope borders and tie downs in a range of sizes, with rope nets and rope ladders made

to order, while non-standard sizes of cyclone nets can be made to order.

Wherever possible the company aims to supply Australian-made products.

It also wholesales to most industries including industrial, mining, and hardware, canvas, marine and manufacturing.

Splicing services are also available and non-standard lengths and sizes are available

on request.

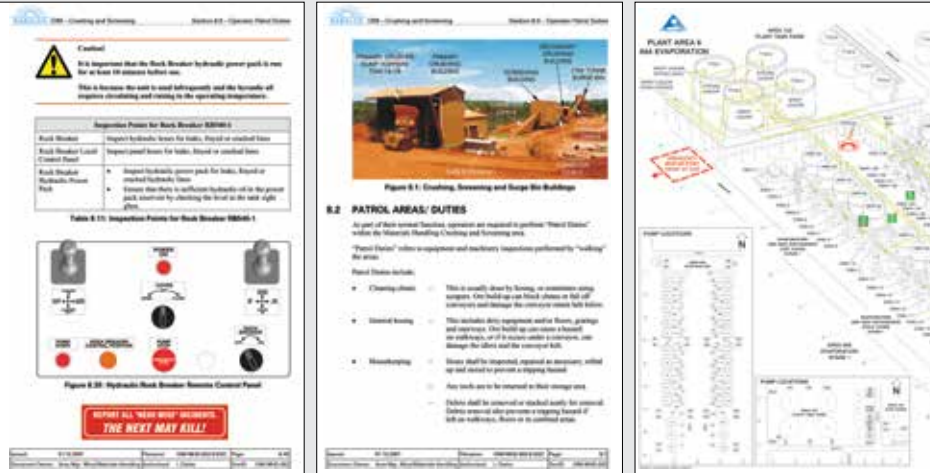
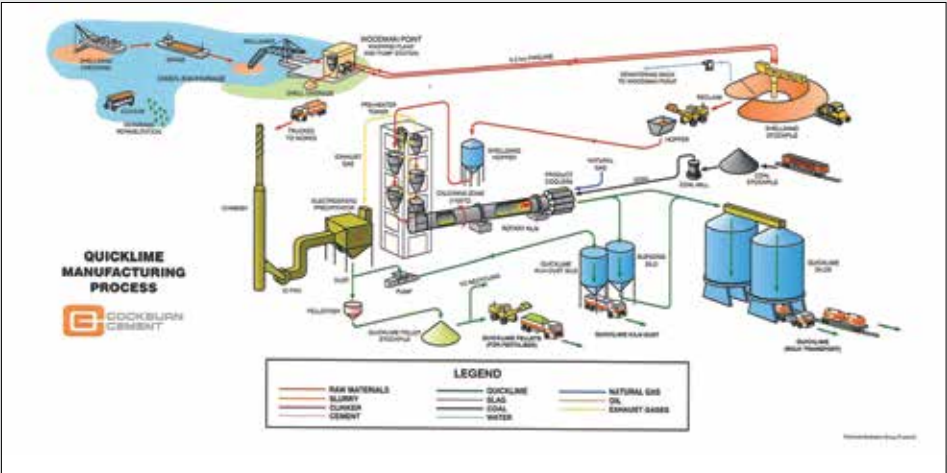
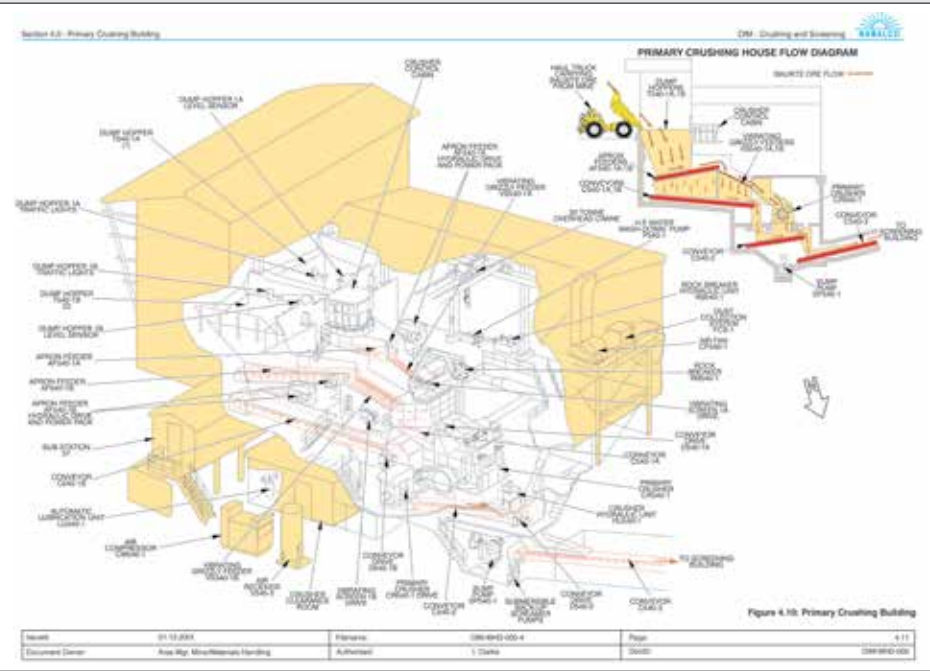
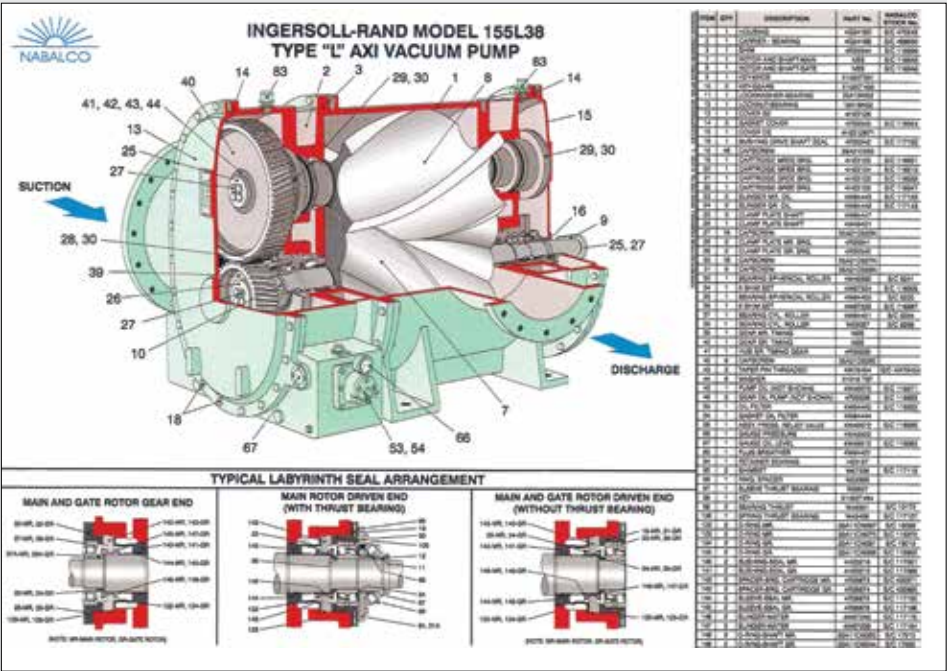
Good quality, competitively priced products combined with old fashioned service and a comprehensive local stock holding has made WA Ropes & Hardware one of the leading wholesalers of ropes, cords, twines and nets in Australia.

The team prides themselves on superior service and finding solutions to those hard problems.

## FOR THE MINING STORIES THAT MATTER







# DRAWING ON 'DUTY OF CARE'

WHEN considering the inherent dangers associated with the mining, petrochemical and processing industries, businesses could benefit from enlisting the help of experienced technical illustrators and writers to produce simple explanatory graphics and hard copy and electronic operating, safety, training and maintenance documentation. Producing all manner of technical documentation and safety material since 1972, Technical Illustrators Group has secured documentation industry leadership in Australia.

## OPERATIONAL KNOW-HOW

With clients throughout Australasia and globally, including New Zealand, Papua New Guinea, Canada, the USA, Saudi Arabia and Asia, Technical Illustrators Group has been at the forefront in the design and implementation of technical documentation long before 'Duty of Care' became a 90s buzzword and a legislative requirement. Technical Illustrators produce simplified documentation to graphically explain how the equipment works and most

importantly, how it should be effectively maintained and safely operated. The team go to great lengths to devise and product a wide range of manuals, safety, emergency and hazardous information instructions that can be easily understood and absorbed at all levels of industry. With a military aviation family history and tertiary Mechanical Engineering qualifications, Technical Illustrators managing director Barrie Douglas knows the importance of doing it right the first time. "We have a deliberate policy of being proactive, continually suggesting to our clients ways to upgrade their safety standards, improve training and production methods to enhance overall safety and productivity," Mr Douglas said.

## CREATING A SKILLED WORKFORCE

Another component of this diverse group is the training services provided to clients' staff. Interactive multi-media computer training programs are designed to guide operators

on a 'one-to-one' basis through structured training that is required as part of their job description. These user-friendly, self-paced, e-learning packages progress the trainee through a series of modules followed by competency-based testing for evaluating competency and understanding. Utilising this technology, clients can readily ascertain how staff members are progressing through the course and identify areas that may need further attention. Some of the courses that Technical Illustrators have produced include modules on complex plant operation, cardio-pulmonary resuscitation and general first aid, danger tagging in isolation work

procedures, safe handling of chemicals, explosives and fire prevention.

## A 'WIN FOR ALL'

Technical Illustrators Group, provides a 'win-win' situation for companies, workers and the community. Clients know that by utilising the expertise provided by Technical Illustrators Group they will be meeting, and possibly exceeding the legislative requirements in relation to 'Duty of Care' for their personnel. Additionally, personnel at all levels can expect a thorough and extensive understanding of the hazards posed in their workplace as a result of the training provided.



# Technical Illustrators Group

Suite 8, 316 Onslow Road, Shenton Park, Western Australia 6008  
Barrie Douglas barrie@ti.com.au | 0419 916 522 | www.ti.com.au



# Professional team, professional outcomes

SERVICING the entire State of WA and beyond, HTE Transport (HTE) can deliver anything, anywhere, anytime.

Over the years, HTE has moved everything from haulpacs through to houses and grain.

With a fleet of 17 prime movers and more than 50 specialised trailers to suit any load, HTE has a solution for all plant mobilisation, bulk and heavy haulage needs.

While just about anyone can move something from here to there, HTE has invested heavily in highly experienced, professional employees with safety processes and fleet to ensure that when it commits to a delivery, it is completed safely and professionally every time.

The fleet is both modern, and highly maintained, which offers clients the assurance of a dependable service.

Safety is a number one priority.

The company has an organisation-wide commitment to safe working practices.

Its commitment to safety and in particular maintenance and fatigue management has earned the logistics service the highly regarded Main Roads WA Heavy Vehicle Accreditation.

For GPS tracking, HTE has invested significantly in a state-of-the-art Logistics Management System.

This system accurately tracks the status of client assets in real time.

In house heavy duty diesel mechanics carefully inspect every vehicle by running through a comprehensive safety check, including reviewing data provided by the Logistics Management System.

HTE Transport offers the complete



HTE Transport provides quality haulage services to the mining sector.

package when it comes to transport needs.

A family run business that is locally owned and operated; it takes pride in every

job and guarantees to meet deadlines and take extra care with cargo, whether it be a pallet of cement or a mission critical mining

equipment.

HTE Transport – Here, There, Everywhere – delivering on time, every time.



Original  
commentary  
and analysis



Cutting edge  
technology,  
products & services



Interviews,  
Breaking news  
and in-depth  
company & project  
profiles

**SUBSCRIBE TO**  
The Australian Mining Review  
and get your monthly copy delivered first

**1 year (12 issues)**  
**\$120 (+GST)**  
**Australia only.**

**Contact us today**

e. [brad@miningoilgas.com.au](mailto:brad@miningoilgas.com.au)

p. (08) 6314 0303

THE AUSTRALIAN  
**MINING REVIEW**





HERE  
THERE

EVERYWHERE



When you're ready to work with a logistics company that goes the extra mile then it's time to call HTE Transport. We can deliver anything, anywhere, anytime. Plant Mobilisation, Bulk and Heavy Haulage is our specialty.

Available  
**24/7**

*The "One Stop Transport Shop"*

when it comes to:

- Plant mobilisation up to 50 tonnes
- Transportation of Counter Weighted Cranes
- Relocation of Transportable Buildings
- Delivery of Steel Structures
- Container Transport and Handling
- Over-dimensional Loads
- Extendable Loads
- Side and End Tipper for Bulk Earthmoving
- Dry Hire of Prime Movers and Trailers
- Specialised Logistics & Project Management
- Tilt Tray
- Intra-State and Interstate Transport
- Pilot Services



# Time critical cross Australia freight



Bohaul Express has proudly serviced WA freight needs for more than 30 years.

BOHAUL Express specialises in the transport of goods from Melbourne to Perth.

It is the objective of Bohaul Express to provide its clients the highest standard of service at all times, on time.

This can only be achieved through the total commitment of management, employees and contractors to quality, efficiency and safe work practices.

Bohaul Express was the idea of managing director Neil Beauglehall in 1972.

His vision was to offer a two-day door to door express service from Melbourne, to the isolated, but fast growing city of Perth; a capital that required freight urgently from the eastern states and back.

Mr Beauglehall's idea gained support immediately and Bohaul Express went from strength to strength, and is now one of the leading independently-owned and operated



express service companies on the long road haul.

Bohaul's linehaul trucks are equipped with airbag suspension, ensuring the smoothest possible transfer of goods from state to state.

It can service a wide range of freight, all of which is carefully loaded by the experienced

Bohaul team.

Bohaul Express is a full road express service with no rail component whatsoever.

The company ensures its continued improvement by having all staff members taking an active part in the growth of the business.

This is supported with open communication and ongoing training.

Bohaul Express staff, in all departments, are always contactable and happy to ensure any freight transactions will suit clients' needs.

More information can be found at: [www.bohaulexpress.com.au](http://www.bohaulexpress.com.au).

## ROAD EXPRESS MELBOURNE, PERTH, MELBOURNE

# BOHAUL EXPRESS

A division of Cappington Pty. Ltd. A.B.N 54 005 583 700

- 2 day express service - Melbourne to Perth Metro
- For time critical consignments
- On forwarding to country WA available
- Delivery to your nominated carrier in Perth
- Hotshot service available
- On line PODs available
- Weekend deliveries can be arranged
- Loading and despatching daily to Perth

### Road express transit times

Depart Melbourne – Arrive in Perth WA

Monday PM – Wednesday AM  
Tuesday PM – Thursday AM  
Wednesday PM – Friday AM  
Thursday PM – Monday AM  
Friday PM – Monday AM

**BOHAUL EXPRESS**  
ROAD EXPRESS MELBOURNE, PERTH, MELBOURNE



**SERVICING  
WESTERN AUSTRALIA  
SINCE 1972**

Contact can be made through our website: [www.bohaulexpress.com.au](http://www.bohaulexpress.com.au)  
or alternatively you can contact Gavin Bridgman: 0438 305 795  
or Jordan Dalgliesh: 0439 888 575



# NEXT GENERATION XRF



## NITON XL5

FASTER    SMALLER    LIGHTER

FOR MORE INFORMATION HEAD TO [PORTABLEAS.COM/XL5](http://PORTABLEAS.COM/XL5)

 **PAS** portable  
analytical  
solutions  
+61 2 4381 2844

ALSO AVAILABLE: **XL2** **XL3**



# Peter Wright

## Bass Metals executive director

ASX-listed junior Bass Metals is in the final stages of completing stage 1 optimisation work at its flagship Graphmada mine in Madagascar that will boost graphite production to 6000 tonnes per annum. On the back of this recent success, Bass Metals executive director Peter Wright spoke with Cameron Drummond about the company's next step – fast-tracking development of its Millie's Reward lithium project.

### Q. What is your role at Bass Metals?

I am an executive director with a focus on corporate affairs, covering capital markets, investor engagement, corporate strategy and deal structuring.

The last two years has seen us fund our project solely from equity markets, which while more arduous than negotiating a debt piece, has fortuitously left us with zero debt and a near completed 100 per cent owned asset.

The corporate strategy from the outset has been to establish ourselves as a mid-cap producer of industrial mineral concentrates, via a pathway of least capital intensity.

### Q. How is the company's flagship Graphmada project tracking?

Graphmada is coming along well. Bass Metals chief executive Tim McManus and the team have done an outstanding job over the past two years to conceive and execute our strategy on budget.

In parallel we have a highly prospective portfolio of exploration assets we are progressing. We as a team are excited as to what lies ahead for our valued shareholders over the next few years.

We are on track to establish stage 1 production of 6000 tonnes per annum (tpa) of high value graphite concentrates, before stage 2 (20,000tpa in 2019 we think), in parallel with growing our resource inventory.

### Q. What are the future plans for the Millie's Reward lithium play, and what needs to fall into place to accelerate the project?

We are looking to establish a lithium resource at Millie's reward. Clearly [with any] pre drilling [project], we have limited understanding on what lies beneath, however at surface I think it's hard to find a more compelling surface signature than what we have encountered to date at Millie's.

We plan to be drilling next year post a comprehensive field program now being undertaken.

### Q. What role will strategic materials have in emerging markets?

Notwithstanding some of the enthusiasm that at times has been misplaced for both commodities, the underlying thematic is highly valid.

With lithium in particular, I find it hard to see that market being balanced over the next seven to eight years.

From my perspective there will be an



enduring buoyancy in lithium prices in particular.

Countries are legislating against internal combustion engines, [and] major global automotive companies are stating they are moving to predominantly lithium ion battery service offerings over the next five to 10 years.

I struggle to see where the supply comes from to balance this demand.

This subsequently affects graphite markets which is the key component of the anode material in the battery. In particular, smaller micron flake market segments within the graphite complex are going to enjoy a material change in demand.

### Q. What factors must mining juniors assess when developing these projects?

At the highest level, is it plausible that the company itself or a larger company could develop the project in question to a profitable mine?

As an additional tool is the project reasonably robust over cycle, as we all know commodity markets are inherently volatile?

I've always taken the 10 year price low for the underlying commodity, and applied this to the financial model and if this is still generating a reasonable provisional net present value (NPV) you have a basis for proceeding.

We selected Graphmada as it gave us a chance, after some hard work, to establish profitable cash flows.

We identified the value in existing infrastructure, the established logistics and customer base, the potential to add to the resource inventory, and that we were

inheriting some significant operational experience directly applicable to the ore body.

We were firmly of the view we were buying the asset at the bottom of the cycle; this was a key factor.

### Q. What is the best piece of career advice you have been given?

That's hard to answer. It's not so much an issue of direct advice received, but I have been lucky enough to work in close proximity to several people in the resources sector over my career.

These people have provided a great example of how to approach things, namely Stephen Bizzell (Bizzell Capital Partners) and James Brown and Paul Mantell at Altura Mining.



# Vermeer Directional Drills, Trucks & Trailers, General Equipment Unreserved Auction

Under instructions from All Australian Directional Drilling. Surplus to Requirements  
Online Auction 23 - 29 November 2017

Assets include:

## Directional Drills



- 2009 Vermeer D80X100 Series 2 Directional Drill (2,181 hrs)
- 2012 Vermeer D36X50 Series 2 Navigator Directional Drill (2,617 hrs)
- 2015 Vermeer D36X50 Series 2 Navigator Directional Drill (348 hrs)

## Trucks & Vehicles



- 2003 Mitsubishi FN 600 6x4 Vacuum Truck
- 2008 Volvo FM 340 Twin Steer Vacuum Truck
- 2001 Volvo FM 12 6x4 Water Truck
- 2000 Hino FB4J 4x2 Side Tipper Truck
- 2015 Holden Colorado RG 4WD Dual Cab Ute

## Trailers



- 2017 Midland Quad Float Plant Trailer
- 2016 Tandem Axle Pipe Trailer
- 2011 Tandem Axle Pipe Trailer
- 2010 Single Axle Box Trailer

## Plant & Equipment, Workshop Tools

- Forklift, mixing pump, rods, pipes, reamers, rammers, various workshop tools

**graysonline**  
.com

View assets for sale at <http://www.graysonline.com/sale/3014135> or contact

Mark Respondek 0439 383 095 | [mark.respondek@grays.com.au](mailto:mark.respondek@grays.com.au)