

National mining exploration research expected to grow mining & METS sector.

The Federal Government, the mining sector and research organisations are joining forces to address a decline in Australia's new mineral deposits, by combining national research into drilling and data collection technology. Mining equipment manufacturers are also contributing, by creating exciting innovative products for the mining sector, providing a win-win solution for all parties. Carole Goldsmith reports.

Mineral and energy resources contributed 50% of Australia's exports and 7% of its GDP in 2017-2018, reports MinEx CRC. This contribution is at risk because of the declining delivery of major new mineral deposits. Increased mining exploration, with more productive safer drilling and improved data collection technology is required to halt this decline.

If this does not occur, there will be fewer mines in the future. This in turn will decrease the long-term prospects for both mining companies and their mining manufacturer suppliers.

To address these issues, the Federal Government in 2018 provided a \$50m grant to MinEx CRC over 10 years through its Cooperative Research Centre (CRC) program, to undertake vital mining exploration research to create new opportunities for finding minerals. The outcomes are expected to also grow the high-value Mining Equipment, Technology and Services (METS) sector.

The world's largest mineral exploration collaboration, MinEx CRC brings together industry, government and research organisations. As well as the \$50m in government funding, it is backed by \$41m in contributions from geological surveys and

industry partners, plus \$49m in non-staff in-kind (NSIK) contributions, and \$78m or 311 full-time equivalent (FTE) staff in kind, all as researchers.

"We commenced in 2018 and already have 10 years of exciting projects of research and collaboration planned between industry and research organisations," says MinEx CRC's CEO Andrew Bailey proudly. "The key to our work is that we are undertaking research that industry wants and that will be able to be commercialised. We work with seven universities across Australia and CSIRO to bring together research that industry can use. The participating universities are the Australian National University (ANU), Curtin, and the Universities of Adelaide, Newcastle, South Australia and Western Australia."

The research is already into its first three-year phase with 95 university researchers from across Australia working on the 10 projects. MinEx CRC education and training projects also include an additional 17 post-graduate PhD students, already underway at the participating universities, working on MinEx CRC research projects. It is also assisting in setting up training for 200 VET (Vocational Education and Training) TAFE students in specific drilling and mineral exploration fields.

Bailey explains: "Our research is broken up into three broad directives: developing more productive, safer and environmentally friendly ways of drilling holes in the ground, using coiled tubing drilling technology, which can cut drilling times by 30%-60% of traditional methods; finding new technologies for drilling data collection; and thirdly, implementing a National Drilling Initiative utilising the best evidence of drilling and data collection from different States and Territories."

He adds that some projects will take the full 10 years to complete, while others will be completed after the first three-year term.



Bailey is a geologist with experience across exploration, mining and research coordination, both in Australia and globally. He has an extensive background building and managing organisations and teams with successful industry research project outcomes.

"The 2019 Australian mining exploration spend was \$2.5bn," says Bailey. "Since the COVID-19 crisis started early this year, the exploration rates have been trending downwards. Exploration is considered to be discretionary spending, which has been cut in the current crisis downturn."

When asked about potential opportunities for mining and resources manufacturers in supplying new types of mining equipment, Bailey speaks about two of MinEx CRC's industry partners' global successes. Imdex, a leading global mining technology company headquartered in Perth, is producing mining and exploration technology and exporting it worldwide. Micromine, also Perth-based, writes and supplies mining software to mining companies across Australia and the world.

Continued next page



*MinEx CRC's CEO
Andrew Bailey.*



MinEx CRC performs vital mining exploration research to create new opportunities for finding minerals.

Continued from previous page

“Australian mining manufacturers wanting more business opportunities should contact Australian mining organisations like Austmine, the leading industry body for the METS sector, and METS Ignited, the government-funded Industry Growth Centre,” advises Bailey.

Moving forward, Bailey recommends: “I encourage all companies to have a three-to-five-year view to grow in the long term. Do research and invest in the future.”

AMT spoke to two Australian mining equipment manufacturers who are doing just that. Oreflow Australia and Austin Engineering are growing and moving forward by researching, innovating and investing in their ongoing future success.

Oreflow - Innovative custom-made equipment for gold and lithium miners.

Perth-based Oreflow Australia Pty Ltd designs, manufactures and supplies quality mineral processing and mining equipment across Australia and globally. Its clients are mainly gold and lithium miners.

Chris Comley, the family-owned company's co-owner, Director And Sales Manager, says: “Mel King, our company's founder and my father in-law, is highly regarded by the mining sector for designing and developing many innovative products. Mel is often asked by other mining specialists including metallurgists, mechanical engineers and EPCM (Engineering, Procurement and Construction Management) project houses to quote on projects that need his expertise.

Oreflow's top selling products are vibrating screens, belt feeders, vibrating feeders, apron feeders and conveyors. ENCAPLOCK, the company's patented dusting encapsulating system, prevents dust pollution, providing significant improvement within the plant's working environment and enabling compliance with dust suppression environmental regulations.

Comley explains: “Mel developed ENCAPLOCK, which secures the dust screen's rubber seal in place. In cheaper



Stacker reclaimers built by Oreflow Australia for the Bald Hill lithium project.



Left: Oreflow Australia founder Mel King with grandson Tait Comley, who also works for the company.

older systems on the market, the rubber seal pops off and the dust is not contained, causing environmental and safety issues for process plant. Our vibrating screens, which are used to wash and separate mined material, are sold all over Australia and globally in the Middle East, South Africa and the Philippines.”

King founded mineral processing equipment company Minspec in 2000, and started Oreflow in 2013. Now the two companies operate at the one site in Welshpool, in Perth's south-east, and employ 14 loyal people, most of whom have been there at least five years.

“Soon after Mel started Minspec, he got his first big break when Western Mining ordered two bucket elevators,” says Comley. “This kicked off Minspec's capital equipment sales. Now 60% of our combined business turnover is in capital equipment for the mining sector and the rest is in maintenance of our equipment at mining sites.” While King owns the majority of the Oreflow business, Comley and his wife Hailey own the balance, while their three sons Tait, Taylor and Isaac also work in the business. Sharon Bayle handles all the company's contracts, technical writing and quality control.

Among the clients that Oreflow has supplied custom-designed and manufactured products to in recent years include: Primero Group's Bald Hill lithium project, in WA's Goldfields-Esperance region, where it supplied a belt feeder, horizontal screens and stacker conveyors; Endeavour Mining Corporation's Ity CIL Project gold operations in southern Côte d'Ivoire; and its Hounde gold mine in Burkina Faso in West Africa, where it has supplied 18 horizontal screens.

“Western Australia's Altura Pilgangoora lithium mine, one of the world's largest open cut lithium mines, is also a major client of ours for spares and equipment,” Comley adds. “Altura ships the raw spodumene ore to China for processing into lithium. Our service team also mobilises to site regularly to help them run smoothly.

“Our Australian and global clients tell us what they want and our draftsmen design the products, using Autopad and 3D design solid works. We have a network of loyal local suppliers to ensure our reputation of the highest quality Australian made equipment endures.”

Covid-19 has affected Oreflow, explains Comley. Although the company has been inundated with requests for quotes in recent times, it is a lot harder to get the green light to proceed.

“We are however looking forward to growth every year,” adds Comley proudly. “Our industry is up and down and you can't always predict what is available. We tender for all Australian and international mining projects within our capability and achieve a 30%-40 % success rate for projects that go ahead, so that's a strong positive.”



Austin Engineering employs 1,800 people worldwide with operations across Australia, Asia, and North and South America.



Inside Austin Engineering's Perth factory.

Austin Engineering – Equipping global mining for over 50 years

Austin Engineering is one of this country's great success stories. Since it first commenced operations 50 years ago, the Brisbane-headquartered engineering and manufacturing company and AMTIL member has grown rapidly. Today it is an ASX-listed business with an annual turnover of \$250m, employing 1,800 people worldwide with operations across Australia, Asia, and North and South America.

David Pichanick, the company's Global Manager – Market Development & Innovation, says: "For over 50 years, Austin Engineering has been developing custom-designed products for both the Australian and global mining industry, as well as for original equipment manufacturers (OEMs).

"In the mining equipment game, large global mining OEMs like Caterpillar and Komatsu don't really know which country or mining site their products will go to, as they are sent around the world. So, the OEMs might make a generic dump body of 1.8 to 2.1 tonnes per cubic metre and that's where companies like Austin comes in. We work closely with metal manufacturers to customise the generic dump body for the particular mineral and client.

"Each mining site has different requirements, whether it be a small miner or large multinationals like BHP, Rio Tinto and Glencore. We have to consistently innovate to maximise the size of the payload and reduce the overall cost per tonne to increase productivity and value-add for the client."

Austin's manufacturing sites are located in Perth and Mackay plus overseas in Indonesia, North and South America. Its

engineering centres in Australia and North America form one global engineering operation focused on R&D for new innovative products.

Pichanick speaks excitedly about one of Austin's recent innovative products: "Our unique two-piece excavator bucket won the 2019 People's Choice Award and was second overall in the prestigious 2019 Swedish Steel Award. This two-piece bucket system was developed after BHP challenged us to produce a safer alternative to the one-piece bucket. BHP has been so pleased with the innovative product, that it has entered it in this year's WA WorkSafe safety awards."

The bucket features a reusable upper section and a consumable lower section, designed for quick and safe bucket change during scheduled maintenance intervals.

Austin's top seller is its range of dump truck bodies, which comprises 80% of the company's sales globally.

"We have many designs of those truck bodies and there's probably one of them at every mining site around the world," says Pichanick. "We have produced around 12,000 truck bodies in our 50 years of operation.

"Our truck bodies that go on the back of dump trucks maximise the payload, carrying as much dirt as possible. The load from our 'flow-control' truck bodies empties slightly slower than other designs; however, slower dumping prevents the truck from lifting the front wheels off the ground and it controls the flow of material into mining hoppers. We offer the lowest cost of ownership for the customer, which ultimately increases their pay margin.

"Many of our engineers have been with us for 20 to 30 years and they are always coming up with new and innovative ideas for products, like our two-piece excavator bucket. People make the business and if you look after your people, you will have a great business."

The COVID-19 crisis has presented Austin, like most businesses, with a host of new challenges, such as how it communicates with its teams around the world.

"We use Microsoft Teams, which is very effective and easy to use for communications with our Australian and global sites," says Pichanick. "COVID-19 has made us a lot more aware of our processes of looking after our people and some of our technical people are working from home. Our factories are still operating, except Colombia and Peru, as those countries are in lockdown."

For the future, Austin's plans entail extending its already-impressive global footprint: "We want to grow, expand and set up in other countries. Austin has just signed a Memorandum of Understanding (MOU) with the large South African mining equipment company Engineering Top Tech (ETT). They plan to sell our products across Africa and we will sell theirs globally.

"Mining is the backbone of Australia and it continues to make the resources the world needs," Pichanick adds. "As a mining equipment manufacturer, we have to constantly come up with new ways to improve products for our customers." **AMT**

This article's author Carole Goldsmith has shares in BHP.

www.minexcr.com.au

www.oreflow.com.au

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Mining to help dig economy out of COVID-19 hole

South Australia's mining sector is well placed to play a crucial role in helping the state's economy off the floor at the conclusion of the COVID-19 crisis, writes Andrew Spence.

According to figures from the South Australian Chamber of Mining and Energy, royalties paid to the State Government are projected to reach \$325m for the 2019/20 financial year, up from \$299m the previous financial year and \$207m in 2015/16. Jobs in the sector in SA have also grown to reach 27,200 direct and non-direct employees this year and have been boosted in recent times by more than 1,000 direct construction and production jobs at Oz Minerals' new Carrapateena copper/gold mine, 160km north of Port Augusta.

While global commodity prices, which are calculated in US dollars, have dipped in the past few months, this has been largely offset locally by a slump in the value of the Australian dollar to some of the lowest levels in almost two decades.

A global survey of 2,400 explorers, developers and other mining-related companies was released in February and listed SA as the sixth-most attractive jurisdiction in the world for mining investment, up from 24th in 2018.

The Fraser Institute Survey of Mining Companies 2019 ranking for SA was the first time the state had been recognised in the Top Ten since 2015, when it was ranked 10th of 109 jurisdictions. In the 2019 survey, Western Australia was ranked Number One ahead of Finland and Nevada.

In November, PwC released its annual overview of Australia's 50 biggest mid-tier mining companies, *Aussie Mine 2019*. The report into the largest ASX mining companies with a market capitalisation of less than \$5bn at 30 June 2019 found revenues of the publicly listed companies increased by 28% on 2018 and their combined market capitalisation had reached its highest level since 2011.

While market caps have reduced in the past couple of months as stock markets around the world suffer through the coronavirus crisis, the pandemic is yet to significantly slow production at SA's major mines.

In 2019, the state produced about \$4.5bn worth of minerals, led by copper, which accounted for about 50% of the value, followed by gold and iron ore. SA is also a major producer of uranium, hosting four of the six approved uranium mines in Australia, which generated more than \$500m in revenue last year.

PwC partner Andrew Forman said the rise in royalties in recent years was a result of increases in both production and sale prices: "What we've seen in the last few years in SA is both of those things:



Underground at Oz Minerals' Prominent Hill mine in South Australia

increases in production, and also a steady increase in commodity prices, which have pulled back a little bit in recent weeks but by and large we're still in a pretty reasonable position and that position has improved.

"The Australian dollar has declined pretty significantly over the course of this calendar year already and pretty much all commodity prices are in US dollars and once you convert that to Australian dollars, it does represent a pretty significant cushion to prices received by Australian producers of mineral commodities.

"While commodity prices have come down a little in recent months from a reasonably good level, I suspect that has largely been cushioned by the decrease in the Australian dollar over the same period."

Forman said that, though the mining gains of the past few years could not be classified as a boom, the degree of caution around investments showed the memories of the tough times following the last mining boom were still fresh in the minds of many in the industry. While times have been uncertain, Forman maintains there is still potential for further growth in this mining cycle.

"I would have said that we are still moving in a positive direction towards a peak, and in my experience, we are not at a position where we are seeing irrational or over-exuberant investments," said Forman. "This build-up feels like it has been a bit more rational and structured than where we got to in the 2006 to 2010 period, when commodity prices reached high levels and we invested in some projects we shouldn't have as an industry.

"The hope or the plan is that mining companies, like all companies, will have to bunker down a little bit during this period because we are in a period of lower confidence and we are in a period where prices will come off a little bit. But we certainly hope that is only temporary, and at some point in the future we'll move back

to the position we were in a few months ago, which is a position where the industry is poised for significant growth including within SA."

The SA Government launched its Copper Strategy in February 2016, which aims to triple the state's copper production to one million tonnes per year within two decades. In March the State Government also announced it would defer costs linked to exploration and licence fees for the minerals and petroleum sectors to alleviate the impact on industry of coronavirus containment measures. In addition, there is a 12-month waiver of committed expenditure for all mineral exploration licence holders.

The state has also recently completed the Gawler Craton Airborne Survey, which captured approximately 1.8 million line kilometres of data over an area of about 324,000 square kilometres – the size of Norway – and is the largest survey of its kind to be done in Australia and possibly the world. The survey aims to help explorers discover new deposits in the region, which is already home to large-scale copper/gold mines Olympic Dam, Prominent Hill and Carrapateena. BHP announced in November 2018 it had made a huge copper/gold discovery at Oak Dam West, 65km south of its Olympic Dam operation.

Forman said the Government's focus on copper was justified but significant new projects would need to commence if it was to go anywhere near achieving its copper target. "We have some very large copper deposits being mined at present and we have a large state by area and there's a lot of prospectivity in relation to copper," he said. "By virtue of those facts, it is a strategy that makes a lot of sense, but I think we would need to discover and develop new deposits in order to be trending towards that sort of target. Generally, we are underweight, and the opportunities are good, so we are well positioned for some large new mining projects."

The South Australian Chamber of Mining and Energy (SACOME) has been the industry's peak body in the state for the past 40 years. SACOME CEO Rebecca Knol said the resources sector now contributed 50% of the state's exports and its workforce was "growing at pace". She said the recent high ranking in the Fraser Institute Survey had allowed the state's mining industry to start the decade on a high note.

"This result will provide positive momentum for the SA resources sector, which is already the engine room of the SA economy and drives innovation and employment for the state," said Knol. "In addition, the resources sector is expected to provide \$325m in royalties to the State Government in the coming year – cash to contribute to the building of roads, schools and hospitals."

As many industries struggle through COVID-19, mining in SA has so far proven resilient. Knol said the resources sector had been defined as an essential service and was taking steps to protect workers and communities from the spread of COVID-19 by implementing measures such as health monitoring, regular cleaning, physical distancing, travel limits and shift changes.

"Our sector is continuing to generate revenue for the state thereby contributing financially to the economic stimulus

packages provided by the (Premier Steven) Marshall Government to businesses and workers affected by the restrictions," she said. "This revenue stream is critically important for the state during the crisis and will remain so throughout recovery and beyond.

"With a proven track record of adaptability and resilience in difficult times, the resources sector is dynamic and innovative, it embraces change and it leads the way. It will be key to SA's economic recovery."

BHP, which operates the state's largest mine at Olympic Dam, is employing an additional 1,500 people across Australia for the next six months to help it maintain production through the pandemic. The company charts more than 40 flights from Adelaide Airport every week to transport thousands of its workers to Roxby Downs near Olympic Dam. In March it adopted new body temperature screening procedures at Adelaide Airport to screen its passengers before boarding. Under the new protocols, passengers recording 38 degrees Celsius or above on a thermal camera will be asked to take a secondary test using a thermometer. Anyone still recording an elevated temperature will not be permitted to board the flight until they obtain a medical certificate saying they are fit to fly.

In a statement to the ASX, Oz Minerals announced it had so far not experienced any production impacts as a result of the virus at its two SA mines, Prominent Hill and Carrapateena. The company is also increasing its ore stockpiles to safeguard production against any worsening of conditions. Oz Minerals Chief Executive Andre Cole said with more than 85% of the Australian sites' workforce based in SA, the state's border closure would have limited impact on the continued operation of Carrapateena and Prominent Hill.

In its statement, Oz Minerals also said the AU\$ copper price had proved resilient against a deteriorating US\$ spot price, and with the vast majority of the core Australian operations' cost base being AUD\$ sourced, the lower AUD\$ has provided an effective hedge against US\$ based revenues. It said demand for copper-intensive items such as air conditioners and cars has begun to improve in China in recent weeks, while the broader market has also been impacted by the temporary reduction in copper concentrate supply from major producing countries in South America and Africa. **AMT**

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