WASH ALUMNI MAGAZINE



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2018 will see many changes, hopefully all positive for WASM, our members and for the industry as a whole.



irstly, I would like to thank the WASMA members who voted me into the role of President and I look forward to continuing the great work done by Tony James (TJ) and Bill Beament before me. 2018 will see many changes, hopefully all positive for WASM, our members and for the industry as a whole.

I would like to thank your new council, being Christian Price (Vice President), Jade Singleton (Treasurer), Ann Meyer (COO), Keren Paterson, Phil Plaisted, Neil Warburton, Brendan Parker, Kyle De Souza, Ken Brinsden, Stuart Tonkin, Wayne Bramwell, Vic Simpson.

I am pleased to advise that the council has signed a Memorandum of Understanding (MOU) and Service Level Agreement (SLA) with Curtin, that will see Curtin cover a portion of our operating costs over the next two years, which will allow your council to focus on you, our members.

the other initiatives for 2018 will be to grow the WASM endowment fund, led by Neil Warburton, Tony James and Stuart Pether. Our goal is to grow the endowment fund to in excess of \$1 million by 2019, a stretch target considering we are coming off a low base; however achievable considering all funds will be invested into our industry's future via the education and training of our future leaders.

In early 2018 WASM will expand to include Chemical & Petroleum Engineering, Mineral Economics and Exploration Geophysics as part of a faculty restructure announced by Curtin. The new school also welcomes a new head of school, Vishnu Pareek, who was previously the head of school for Chemical & Petroleum Engineering. Vishnu will be supported by Chris Aldritch, Deputy Director and Sam Spearing, Director of the WASM Kalgoorlie campus. On behalf of WASMA I welcome Vishnu and Chris into the fold and it's great to see that Sam will continue to instil his passion and sense of humour in Kal!

WASMA also welcome all past and future chemical, petroleum, mineral economics exploration geophysicists into the Alumni. As a council we are very mindful of maintain our unique brand, but also welcoming new members into the fold. This will present a unique challenge for the Alumni in 2018, but is one that we are committed to achieving.

Our Events committee, led by Brendon Parker, has established an events calendar for 2018, with the sole purpose of supporting you as our alumni; I encourage all members to attend as many functions as possible to ensure we continually improve our member services, through initiatives like our mentoring program, podcasts and networking with key industry figures.

We are also hopeful that our dream of developing a School of Excellence in Kalgoorlie will become a reality over the next couple of years. We are starting to gain traction with the concept and have the support of Curtin, Central Regional TAFE and Kalgoorlie Boulder to start placing the building blocks to crystallise the concept. This will require ongoing industry engagement and support. Bill will also be rallying the Patrons group to assist our cause.



SANDVIK AND WASMA A ROCK SOLID FUTURE

Sandvik and WASMA believe a rock solid partnership is the best foundation to support the future of mining.

As WASM Alumni's Premium Partner, Sandvik is privileged to have the opportunity to network with, mentor and learn from the next generation of mining leaders.

Sandvik and WASMA - partnering for a better future and education in the resources sector.

To find out more about Sandvik Mining and Rock Technology, visit us at mining sandvik.com

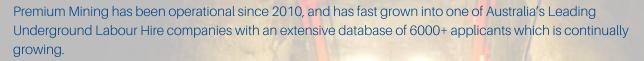




PREMIUM MINING PERSONNEL

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Premium Mining is a WA Owned and Operated Mining Supplier who specialise in Labour Hire, Consulting and Equipment Hire Services. Premium Mining currently have offices based in Perth, Kalgoorlie and New Zealand.



Paul Allison, the Owner/Operator of Premium Mining prides his company in being a 1-stop shop. (Labour Hire, Consulting and Equipment Hire).

Paul has been in the mining industry for 25 years and in that time has worked with many large scale mining companies therefore giving extensive knowledge in Mining, Recruitment and Contracting Services.

Paul also has a team who have a great depth of expertise, experience and leadership, specialising in driving and executing the clients needs and objectives in the Mining industry, in Australia and Overseas.

Premium Mining believe in being an equal opportunity employer and giving back to the community.





There's no easy path to success in the mining industry, but Trigg Mining managing director KEREN PATERSON has met every challenge head on.

Defying the prevailing stereotypes of the early 90s, she made her way as a mining engineer by studying at the WA School of Mines, and two decades on, a pioneering spirit has put her in the running to become one of Australia's first potash producers. Keren offers her own insight about being successful in mining and the excitement of establishing a new resources company.

Keren, what first inspired you to get involved in the mining industry and study at WASM? Do you have any advice for today's students based on the experience gained in the course of your career?

I was initially interested in a career in civil engineering and did work experience with Clough in year 10, but I didn't find the experience very inspiring. A conversation with an uncle led me participate in the Chamber of Minerals and Energy Focus on Mining Seminar a year

later. I enjoyed the trip to Kalgoorlie so much I was determined to return to study Mining Engineering at WASM and I'm so glad I did.

What initially attracted me to mining was its tangibility – you can see the impact of your work on a daily basis. I was also fascinated with the diverse subjects that can make up a mining engineering degree and excited by the opportunity to live and work in the bush.

My advice to students is to be curious and open to opportunities, even if they don't seem to be a logical next step. My career to date has been enriched by the diverse roles I've had and especially by those where I stepped well out of my comfort zone.

I also think the process of becoming a mining engineer through the WA School of Mines enables us to develop leadership skills that are applicable in any work place. The vacation work and mandatory on-



the-job experience required for the statutory certificates for managers ensures we become practical and innovative leaders very early on in our careers. Many of our alumni were in senior leadership positions in their twenties, which seems quite normal in mining, but in the broader workforce it is really quite unusual.

You started your own career in the early 90s, when there was less encouragement for women to join male-dominated industries. The mining industry in particular had a reputation for a significant lack of gender diversity: What sort of challenges did that present?

Things have changed a lot in my time. At my first induction at an underground mine, the instructor, sat on my desk, leaned over and said to myself and a fellow female engineer "ladies, if you need to move your typewriters, just get one of the lads to do it." Little did he know that I would be on an airleg a few weeks later.

There is still a lack of diversity (not just gender), but a lot has changed. On a recent flight to a large gold mine in WA, I was really encouraged to see just how many women were on that flight.

I think that was a part of it. I'm quite motivated by challenge and

I started out initially following a traditional career path for a Mining Engineer. I moved quickly through the operational roles in underground and open pit mining to become a Mine Manager, but after being awarded the Telstra Young Business Woman of the Year and completing an MBA (Master of Business Administration), my career expanded into areas I never knew existed when I first chose to be an engineer. I think my constant curiosity and thirst for challenge has led me to take on some really interesting roles including leading an international company takeover and taking a uranium exploration company to IPO.

It sounds like you've met a lot of challenges head on, have you had any career setbacks?

Yes, the most significant one was when I was shuffled sideways because the new General Manager didn't think a woman should be an underground production engineer and it would be more appropriate for me to be in an open pit planning role. I'd dealt with sexual harassment and bullying before, but this event really set me back on a personal level. So, I still delivered on the feasibility and started the pit, but sold my house, bought a Kombi and travelled Europe, planning to come back to Australia with an entirely different career choice.

Fortunately, I visited a fellow mining engineer in Ireland who took me underground and I knew right away that mining was in my DNA and I was coming back.

So, it's certainly not been all 'beer and skittles' although there is always fun to be had. It's been about being resilient and determined, but on the flip side it has been incredibly rewarding with opportunities to travel, work with some amazing people and work in places I would never have dreamt of when growing up. The motto on my plaque at the WASM Social Club bar reads, "Have the courage to back yourself." And I remind myself of that every year when back in Kalgoorlie for Diggers and Dealers.

You certainly have done that: Mid 2017 you started Trigg Mining to explore and develop sulphate of potash (SOP), which is a new industry here in Australia. It must be a thrill to have recently completed the first drilling program at Lake Rason?

It certainly is, the last six months have been very exciting. We've negotiated an agreement to earn 100% of more than 2,500km2 of prospective tenements near Laverton in Western Australia, raised \$1.8 million in seed funding and completed our first drilling program at the Laverton Links Project.

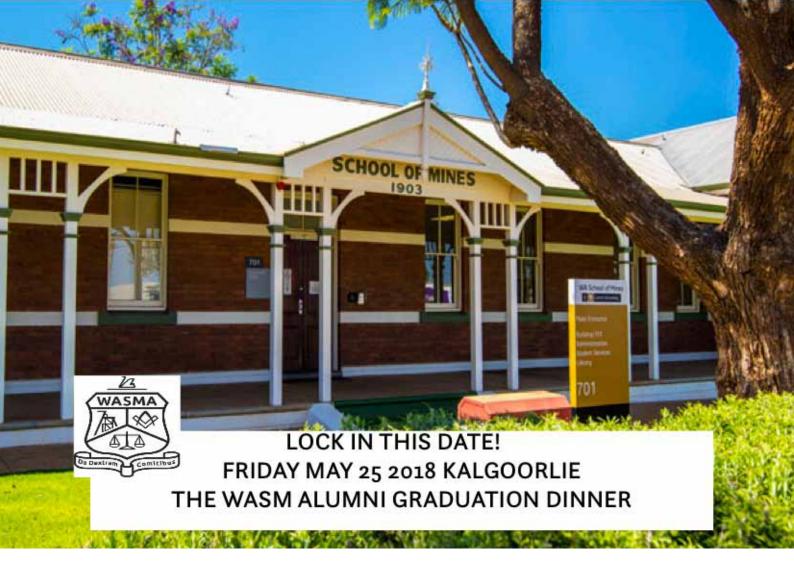
It's been an incredible opportunity to deliver on a longheld dream to start a company from scratch and I feel very fortunate to have assembled an awesome team who are all working very hard to make Trigg Mining a success. We're now working towards the company's IPO and listing on the ASX in 2018.

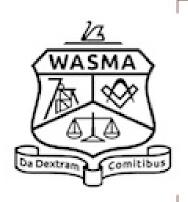
What was the attraction to your current potash play?

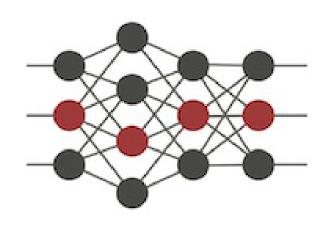
One of my reasons for entering the mining industry was seeing the legacy environmental issues first hand whilst camping with my family and wanting to do it better. What I like about sulphate of potash is that it's dissolved in salty brine water, which means it has a minimal impact on the landscape as there's no open pit, underground or even a waste dump to rehabilitate. We also harvest solar energy in the production method to evaporate the brine water and produce the sulphate of potash and other mineral salts.

As a commodity, potash is becoming more and more important. It is one of the key ingredients in fertiliser, whether that's for large scale farming, or growing the veggies in your backyard, we need fertiliser to be able to feed the world's population. As the world's arable land declines and the population continues to grow, SOP will continue to be a very important commodity for ensuring global food security.

I naturally question the status quo.







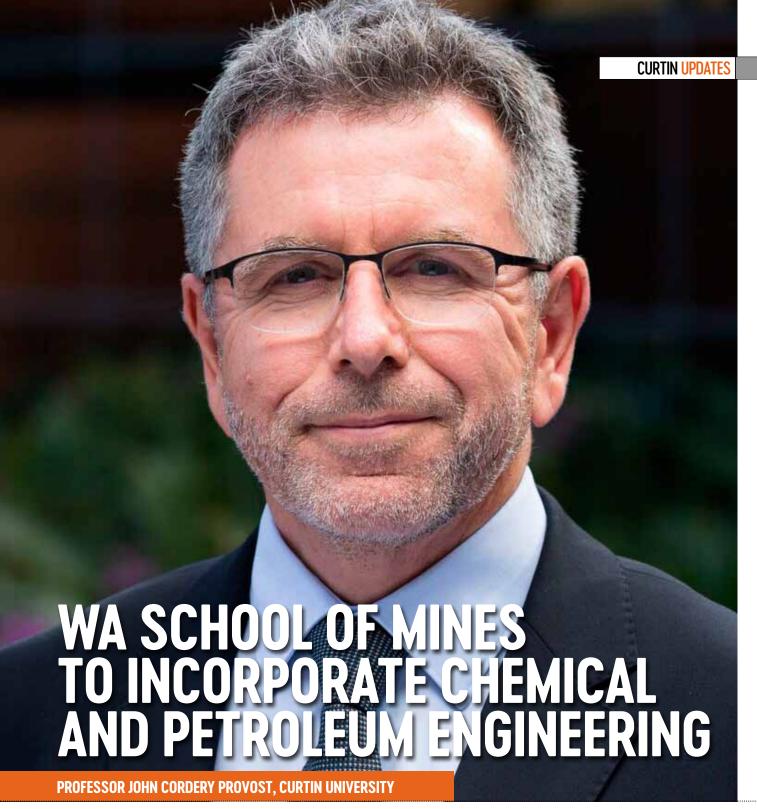


LAWYERS

WA School of Mines Alumni - Resource Connect

Date: Wednesday March 21 2018: Address: 77 St Georges Terrace Perth Time: 5pm - 6.30pm Members Complimentary - Non Members \$30.00 Register online @

https://wasma.com.au/event/wa-school-of-mines-alumni-resource-connect/



By all accounts, 2017 has been another great year for Curtin University, and for the WA School of Mines.

urtin became the first Australian university, outside of the Group of Eight, to be ranked in the world's top 200 universities on the prestigious Academic Ranking of World Universities, placing it in the top 1% of universities worldwide. In the same year, we also saw Curtin ranked second in the world, and first in Australia, for the subject area Mineral and Mining

Engineering by the QS World University Rankings. In 2017, Curtin University also entered a new phase in its strategic planning cycle. This phase is focused on 'Delivering Excellence', and is concerned with sustaining Curtin's rapidly rising trajectory towards the realization of its vision of being a recognized global leader in research, education and engagement by 2030. As part of this, we undertook

WA SCHOOL OF MINES TO INCORPORATE CHEMICAL AND PETROLEUM ENGINEERING CONT.

a review of our Faculty and School structures to make certain that they aligned well with our strategy and projected future performance and capabilities.

As a consequence, an exciting new transformation is occurring in the WA School of Mines. From January 2018, the School will incorporate the powerful resources engineering disciplines of Chemical and Petroleum Engineering, which had been located in a separate school, as well as Mineral and Energy Economics (currently located within Curtin's Graduate School of Business). This is seen as a positive development for the WA School of Mines, broadening its disciplinary base whilst concentrating disciplines associated with the resources sector within the one school. Exploration Geophysics will remain in the WA School of Mines, along with Mining and Metallurgical Engineering, while Applied Geology and Spatial Sciences will move into a new School of Earth and Planetary Sciences. Both Applied Geology and Spatial Sciences will continue their existing teaching into WA School of Mines programs. The changed composition and expanded reach of the School is now reflected in the list of disciplines appended to the title of the WA School of Mines: Minerals, Energy and Chemical Engineering. The reconfigured WA School of Mines will have a new Head, Professor Vishnu Pareek, while its operations on the University's Kalgoorlie campus will continue to be led by Professor Sam Spearing - Director, WASM Kalgoorlie.

WA SCHOOL OF MINES

MINERALS, ENERGY AND CHEMICAL ENGINEERING HEAD: PROFESSOR VISHNU PAREEK

WA SCHOOL OF MINES
KALGOORLIE
DIRECTOR: PROFESSOR SAM SPEARING

DISCIPLINES AND TEACHING PROGRAMS

MINING
METALLURGY
EXPLORATION
GEOPHYSICS
CHEMICAL ENGINEERING
PETROLEUM ENGINEERING
MINERAL AND ENERGY ECONOMICS

TAG Financial Group

TAG use the latest mobile technology to understand visually where you're headed financially. We help you understand your goals and create a tailored plan, with ongoing support, to assist you in achieving these.



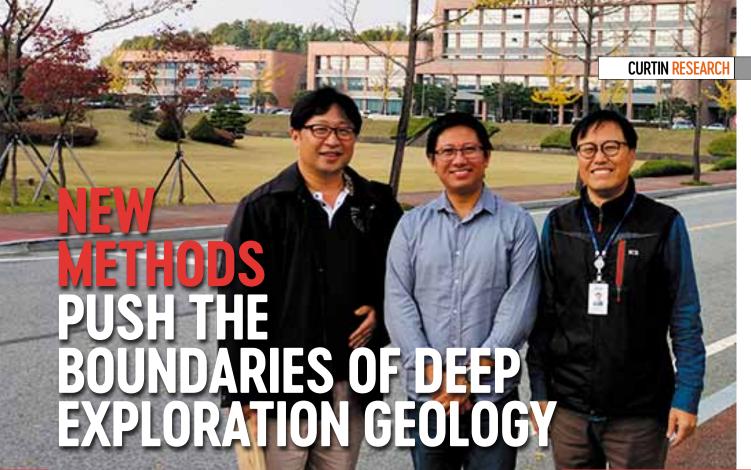


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New solution to South Korea's natural resources scarcity

Alorro notes his project is just one of the many areas being looked at closely by researchers in South Korea in response to the country's natural es scarcity. He is pictured here (centre), ide Dr Youngmin Oh of Danam-ENE Co. Ltd. (left) and Dr Sooo Kyung Kim of Korea Institute Geoscience and Mineral Resources (right)

Curtin scientist is collaborating with a South Korean production company to research a new method of recovering precious metals hidden in discarded smartphones and other end-of-life consumer products.

Go to any landfill and you'll discover a sea of waste, but it's a sea that hides a treasure trove of precious metals. A smashed computer could reveal a central processing unit lined with gold. A broken monitor could expose a cathode ray tube composed of copper. And these precious metals can all be mined, if treated correctly.

For some countries, it's reasonable to say this unorthodox source may act as a lifeline. This is particularly true for South Korea, which imports 99.3 per cent of its metals due to a scarcity of natural resources.

In recent years, the country has been increasing its so-called 'urban mining' activities to help satiate its population's demand for the latest technologies ¬- the country's 51 million people boast the highest rate of smartphone ownership in the world - however the method used to recover precious metals from end-of-life consumer products still needs some refining.

At the moment, the precious metals contained in these 'urban mines' are dissolved using acidic or alkaline solvents, but as they are often found with unwanted components, the solution is considered 'dirty'. So what is the best way of extracting the precious metals? Curtin WA School of Mines researcher Dr Richard Alorro may hold an answer.

"My research proposes a method called 'Magnetic Solid Phase Extraction'. The precious metals are recovered by adsorbing onto a solid material with magnetic properties and then the loaded adsorbents are harvested, then stripped of the precious metals," he explains.

"The precious metals - now relatively pure - undergo further refining to produce individual metals, such as gold or platinum bars, and the adsorbent is treated and re-used.

"The advantages of this method include the fact that magnetic adsorbents can be easily separated from the mixture using a magnet, high selectivity means the adsorbents take only precious metals and their high capacity means they can load a considerable amount of precious metals per unit area or mass."

Alorro began researching urban mining activities in South Korea after he was successful in the first round of federally funded priming grants, which seeks to connect Australian researchers with small and medium-sized enterprises in select countries around the world.

His three-year project, 'Selective Recovery of Gold and Other Precious Metals from Urban Mines', will see him collaborate with Daname-ENE Co. Ltd., a South Korean production company that is best known for its water filtering, purification and electrolysis system products, to develop a new purification method for recovering precious metals.

If successful, Alorro believes he might further help to prove the financial benefits of urban mining, and not just in South Korea. A recent journal article in Minerals Australia has found that in 2014 only 65 per cent of electronic waste in Australia was collected for recycling.

"In this day and age, where technology advances at a rapid pace and becomes obsolete quite easily, the end-of-life of many consumer products has become significantly shorter. In return, the world is generating massive amounts of urban wastes, which is posing major challenges in terms of waste management, environmental and health hazards and availability of resources," Alorro explains.

"Urban mining is the mining of the future. When all metals, fuel and other natural resources are exhausted from the Earth's crust, where else are we going to get the materials we need to sustain life?"

NEW METHODS **PUSH THE BOUNDARIES**

RA

urtin researchers are finding ways to combine seismic and electromagnetic data to generate highly detailed pictures of the subsurface. These pictures are then used by mineral explorers searching for new mega-deposits of gold, copper, lead, zinc and other commodities at varying depths below the surface.

For the past century, the search for oil and gas has relied primarily on seismic reflection. More recently, they have deployed electromagnetic methods in deep ocean settings. Seismic reflection involves the creation and measurement of seismic vibrations in the earth as a means to map the earth's subsurface, while electromagnetic methods, such as magnetotellurics (MT), measure distribution of electrical and magnetic fields in grids of sensors to reconstruct electrical properties in the earth, and in doing so, gain insight to what lies beneath.

Vastly different, each technique has been treated quite independently. However, according to Curtin Associate Professor Brett Harris, there are clever ways to combine the technologies to achieve an improved representation of subsurface geology with important application in hydrocarbon industries, groundwater, hydrothermal and minerals industries. These "cooperative inversion" methods will be needed as Australia explorers transition to searching at much greater depths for new massive tier one mineral deposits.

"Seismic is tremendous in that it's accurate and it can usually identify boundaries of a subsurface layer or even mineral deposit," Harris explains.

"The problem with electromagnetic technology is that it gives a low-resolution image of the subsurface. So instead of seeing the presence of ore minerals in an area, you just see this big hairy blob.

"However, when you couple the power of the seismic with the electromagnetism, you can locate a target in a specific subsurface geological horizon."

Harris is the leader of the Joint Inversion of 3D Seismic and MT Data project run by the Deep Exploration Technologies Cooperative Research Centre (DET CRC). DET CRC was established under the Australian Government to devise more successful, cost effective and safe ways to drill, analyse and target deep mineral deposits.

Harris and his team - comprising fellow Curtin researchers Dr Andrew Pethick, Professor Anton Kepic, Dr Ralf Schaa and Curtin PhD students Van Anh Cuong Le and Duy Thong Kieu - are investigating ways of combining the seismic and MT techniques to produce accurate high resolution geology for deep exploration targeting.

The key is to repeatedly compare the field data with data simulated over a detailed numerical model of the subsurface until an acceptable match is achieved - a process known as inversion. This process is extremely computer intensive and so the team have turned to one of the fastest computers around, the Cray Cascade Magnus supercomputer in the Pawsey Supercomputing Centre in Perth, to run their inversions.

Harris says that implementation of the process is technically onerous requiring specific expertise, which is why his team are also striving to automate cooperative inversion. This will mean that data beamed in from the field can automatically be converted to a subsurface image.

The reason we're pushing automation is because the process of converting field data to a subsurface image is heavily dependent on the ability of the people processing it," says Harris.

"Instead, we're suggesting that once you have set up your instruments, you can send back the data straight away and update your understanding of the subsurface almost in real time."

To test, Harris and his team conceived multiple cooperative inversion strategies and compared them at a location in the Carlin gold deposit district in Nevada, USA - one of the world's largest concentrations of gold.

After receiving their results, the team compared outcomes for drillhole data and concluded that their strategies provided dramatically improved detail and resolution when compared with standard methods.

Harris notes this is infinitely valuable for deep mineral exploration.

"It's not something people outside the resources industry understand, but the vast majority of exploration doesn't end up in an economic deposit," notes Harris.

"These strategies are impactful because we can now produce a high-resolution image of the subsurface that we didn't have before."

Harris and his team are now working towards releasing the findings from the next stage in their research, where they are classifying seismic reflection data based on the macroscopic texture - the joints, faults and metamorphic processes - of the subsurface rock to help develop even clearer images of the subsurface.

If you would like to know more about cooperative inversion of seismic and MT data, read the team's research paper.

WASMGA SCHOLARSHIP AND BURSARY FUND INC

Since 2012 the WA School of Mines Alumni has raised over 300,000.00 to fund scholarships for all WASM students.

The fund is dedicated to the welfare of students attending both Kalgoorlie and Bentley campuses of Curtin University. Part of the scholarship is to offer mentoring and assist in securing Vacation work during study break.

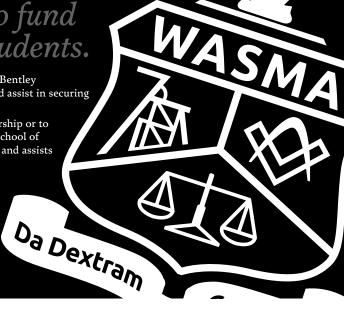
Whether it be to ease financial hardship, reward academic excellence and leadership or to enable regional students the educational experience opportunity that the WA School of Mines offers, WASM Students benefit from the alumni's fund in so many ways and assists them on the path to success in the Resources Sector.

We are asking for your help to increase the number of scholarships per year.

You can donate by simply going to wasma.com.au/fund/

The fund is tax deductible and a registered charity and any amount you can spare would be greatly appreciated.

The WASMGA Scholarship & Bursary Fund Inc. allows you or your company to get involved and give support to the next generation of world-class mining graduates.

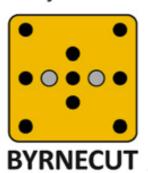


The WA School of Mines Alumni warmly thanks our scholarship donors

















WASM ALUMNI SCHOLARSHIP FUND

BECOME A DONOR AND BE A PART OF THE NEXT GENERATION OF MINING GRADUATES FROM THE WA SCHOOL OF MINES

GOLD

THE WA SCHOOL OF MINES FUND



announce that thanks to the generosity and support of the WA School of Mines alumni community, over \$550,000 has been donated to the WA School of Mines Scholarship Endowment Fund. This contributes to an overall target of \$2 million for the WAIT Alumni Scholarships Campaign, established to help current and future generations of Curtin students to reach their full academic potential, irrespective of their financial circumstances. Thank you for being part of this special initiative.

The funds raised will be endowed in perpetuity to create a long-term sustainable source of funding for generations of WA School of Mines students. Funds are already earning annual interest through Curtin's longterm investment pool, and the interest generated will be allocated towards establishing new scholarships. Students will be invited to submit their applications for the first round of scholarships in Semester 1 2018, receiving the funds in Semester

I would like to extend our sincere thanks to WAIT Ambassadors Peter Bradford (Chair), Neil Warburton, Barry Upton, Roger Kwok, Lloyd Smith, Tom Silvan, Greg Howlett, Ian Skelton, Brian Mumme and James Best for their generous and considered commitment to this campaign.

You will have read in the last edition, highly-skilled and wellequipped students, like Natalee Evans, the first recipient of Curtin University's WA School of

urtin University is proud to announce that thanks to the generosity and support of WA School of Mines alumni Australia, and beyond.

Mines Scholarship Endowment Fund, are the future employees and company leaders of Western Australia, and beyond.

Together with the invaluable assistance of our campaign ambassadors, donors and advocates, we are delivering real societal benefits, and making tomorrow better. On behalf of everyone at Curtin University, our deepest thanks, we are extremely grateful for your generosity.

CELIA HURLEY

Chief Advancement Officer Curtin University

"The scholarship that I received as a result of the WAIT Alumni Scholarships Campaign has enabled me to easily secure a place of residence in Kalgoorlie. This has provided me with a smooth transition into my graduate position as a Junior Geologist with Northern Star Resources Limited. It has also assisted me with the purchasing of field mapping equipment, books, work uniforms and other materials that I use on a daily basis at work and off-swing periods, at geology expeditions around the Eastern Goldfields Region. I aim to use the remainder of my scholarship on structural geology books as well as geological maps of the Goldfields area, and for travel to and from Perth for Curtin networking events. I am very grateful to have been given this scholarship and look forward to being involved as part of the Curtin alumni community".

NATALEE EVANS

WA School of Mines alumna

WASMA MEDALS ANNOUNCEMENT

GOLD MEDAL WINNER

METALLURGY

Victoria Arrowsmith —has graduated with a BSc in Extractive Metallurgy but is completing the conversion to complete her BEng in Metallurgical Engineering. She has work experience with Hanking Gold Marvel Loch Process Plant (Metallurgical Vacation Student) and at the BHP Billiton Nickel West Kambalda Concentrator. She has received a WASMA Scholarship and several Curtin student travel bursaries, spending a full semester exchange at the Colorado School of Mines, USA and a summer exchange program at Chonnan University, South Korea. She is a Student mentor at Kalgoorlie Campus, was the 2017 WASM Kalgoorlie Student Guild VP and has been an active member of the WASM Wombats, AUSIMM Student Kal Branch Committee, WASM Social Club and Secretary of the Women of WASM

SILVER MEDAL WINNERS ON ACADEMIC PROFILE



APPLIED GEOLOGY

Sara Arnoldi (1st Class Honours - App Geology) WASMA GIG Scholarship



EXPLORATION GEOPHYSICS

Madison Fairburn (1st Class Honours Double Degree App Geology and Geophysics)

Won WASMA Silver for App Geology 2016



METALLURGY

Victoria Arrowsmith (BSc Extractive Metallurgy, completing conversion to BEng Metallurgical Engineering)

WASMA Scholarship recipient



MINING

Jonathon Flynn (1st Class Honours BEng Mining) WASMA scholarship recipient



SPATIAL SCIENCES

Jeff Ball (1st Class Honours — BSc Geographic Information Science)

(Won WASMA Silver for Spatial in 2015)



The Mining Buckle Collection pictured, belonged to Mr Bruce Prichard, a boiler maker by trade but a mining person at heart.

ruce spent 30 plus years working around WA With stints in Leinster, Tom Price, Collie and Kalgoorlie. Bruce's beloved wife Lyn and children Sean and Keralee became accustomed to regular shifts from mining town to mining town. Bruce was a Supply Manager at Paddington Gold in the late 1990's and by this stage, his belt buckle collection was growing quickly. Suppliers in the region all knew about Bruce's collection and would go out of their way to present Bruce with buckles from mining companies, contractors and suppliers alike. The cabinets were made at various times by different people hence the different sizes and styles.

The collection which totals around 450 buckles is a trip down memory lane for mining folk that have 'been around' and every time you look through the collection, you will see a buckle with a company name that takes you back to a moment.

Bruce Prichard or 'Gramps' as the grand kids knew him passed away in August 2016 and the family wanted the collection to be accessible to mining people that shared the same passion for the industry as he did. The collection was donated to the Western Australian School of Mines to be enjoyed by generations of miners to come.

Rest in Peace Gramps. Mick Radi and Family

(When you next visit Kalgoorlie call into the WASM campus and view the collection)



COMITIBUS'

is thought to translate to "extend your right hand" or more contemporarily as "look after your mates"

Any information welcome. Contact Philip Plaisted philplaisted13@gmail.com

WASMA ALBALL ON THE POINT

























WASMA GRADUATION

SUPPORTED BY CURTIN UNIVERSITY









EVENTS CALENDAR

MARCH 8 WASMA Mentor Meet and Greet with Stuart Tonkin **CEO Northern Star Resources** wasma.com.au/events/



VIP Special Event Watches of Switzerland BY INVITATION ONLY wasma.com.au/events/

MARCH 21

Resource Connect wasma.com.au/events/

APRIL 11

Resource Connect wasma.com.au/events/

MAY 16

Resource Connect wasma.com.au/events/

MAY 25
WASMA Graduation Dinner Kalgoorlie wasma.com.au/events/

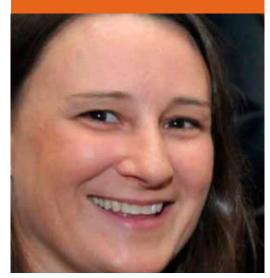
THE WASM ALUMNI ANNUAL BALL LOCK THIS DATE IN NOVEMBER 3RD 2018 THE BALL IS GOING TO KALGOORLIE







MICHELLE KEGAN



How important is the WA School of Mines campus in Kalgoorlie to the Resources industry?

When I completed my undergrad, we didn't have an option to study anywhere but Kalgoorlie. I am glad in many ways that this was the case, given it meant we had a larger group on campus, across all disciplines, with the added advantage of having easy access to the mines. While I had lived in Kalgoorlie for my last 2 years of high school, I think living there as a mining student ensured we were ready for the mining industry...in more ways than one! I loved it so much I came back to study mineral economics and thoroughly enjoyed doing that there too.

Were there any disadvantages or advantages to being a woman while studying at WASM and if so what were they?

I found as a woman studying at WASM, we were neither advantaged or disadvantaged. Everyone I came across at WASM considered us all as equals. Now organisations such as WIMWA (started by another WASM grad, Sabina) provide forums for women at WASM and across the industry to share and learn from each others experiences. Through this, WIMWA helps to ensure the industry continues to prosper with both male and female champions of change.

What can we do to ensure our young girls in high school are given the opportunity to explore the world of mining?

To me the world of mining is dynamic, entrepreneurial and full of choice and opportunity. Everyone that leaves WASM ends up with their own "DNA" of experience, and the industry provides so many paths to create this. To ensure young girls are provided this opportunity we first need to make sure they see what we see. Given how low the current numbers are graduating from mining across Australia, we won't change this quickly but we can increase how and where we share the benefits of the career we have had. I would love to see more women (and men) studying mining and think we can do this by sharing our experiences with young kids across primary and secondary schools. Lets not just focus on how many women are in your workplace but how many young girls you've shared your story with, in an effort to keep it going.

You have a degree in Mining Engineering, what was your first job in the industry?

My first job as a graduate was a two year stint with Normandy Mining based in Tennant Creek (NT). As they say... ignorance is bliss.... I had never heard of Tennant Creek when I received the letter

of offer but I was pretty excited about it! Working at White Devil and Gecko, I gained the underground experience I needed for my UG

Supervisors ticket. I worked with some great people and shared some great adventures around the Territory.

As remote as it was, it was still only a short drive

to Isa to catch up with other grads, and an Aussie Post flight to share a story or two in a letter with others.... Yes my grad year was pre-email!

You are the Vice President of Incitec Pivot; does having a degree in mining help you in this position?

Both the onsite mining experience and the mining degree has definitely helped me in my role and career at IPL. Its definitely easier to understand the customer if you've worked as one!

The combined WASM degrees also gave me good knowledge to make the most of the roles I held in strategy and business development at Rio Tinto in Australia and London. The fantastic thing about WASM is that you are set up with knowledge and the ability to practically apply it.

Our western culture rarely empathises with anyone who might fail at a task, project or a particular job. Do you believe you can learn from your failures?

Mining is far from an exact science. We're always learning, whether it is from our successes or failures. The key to me is about being open to other companies and industries to learn from, partner with or take an investment in.

What do you love most about your career?

My career has provided me diversity of roles, travel throughout Australia & globally as well as the opportunity to work with some great people.

Across each organisation I have worked at, there have been excellent advocates (including Carl Adams, ex-WASM graduate) who have provided new opportunities enabling me to push boundaries and build on each piece of experience and knowledge. I have equally enjoyed applying my experience through various women in mining committees across Australia, which continue to be great organisations to support a sustainable diverse workforce.

My tips are to be resilient, to accept every opportunity....

And to provide opportunities! ■



JO BARRON-PERRY

How important is the WA School of Mines campus in Kalgoorlie to the industry?

It is very important to the industry. It gives a twofold advantage to students as they see firsthand the industry on the doorstep. The industry can support a campus that is dedicated to the minerals and resource sector.

Were there any disadvantages or advantages to being a woman while studying at WASM and if so what were they?

I graduated over 20 years ago. So my view on the advantages and disadvantages of been a woman in a male dominated sector was much different then to it is now. We were still novelty's and we were the first ones to tackle the status quo in the underground space. The only thing that as very noticeable to me was that I transfer from Ballarat University to WASM and I went from the only female to been one of over 10. That was the difference for me.

What can we do to ensure our young girls in high school are given the opportunity to.

I think that having more teachers understand the resources sector and STEM subjects would be the way that will encourage them to enter the industry.

How do you balance Family life and a career?

When my daughter was younger my ex-partner assisted greatly with the hours that I was working also we had a number of Au-pairs whom without them we could not both done production roles. Living in remote towns was the solution for us with a young child when both of us were professionals in the industry.

Our western culture rarely empathises with anyone who might fail at a task, project or a particular job. Do you believe you can learn from your failures?

Definitely! It's how ANFO was discovered!. you have to do things by trial and error and mistakes are a part of that. We are all not perfect.

Would you encourage your daughter to go into the resources sector?

Yes and No!. She is very keen to be a Veterinarian since she was 6 years old. So I will encourage her to follow her dream. I wanted to be an engineer from that age and was encouraged to pursue that as it was my dream and never gave up on it. If she chooses the resource sector (as her parents are mining professionals and she is a Kalgoorlie born kid) then I will set her up to be resilient. Ensure she has supporters, mentors and give her more guidance on financial needs due to the cyclic nature of the industry and the ability to be more flexible with her qualifications so that if she wishes to switches tack she can in during the down turns.

Tell us about your current position

I am currently the Senior Inspector of Mines for the South West Victorian region based in Ballarat for the Victorian Government with Earth Resources Regulation of the Dept. of Economic Developmental and Jobs and Transport. Ironically back in Ballarat exactly 30 years after commencing my career journey in engineering.

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SALLY-ANNE LAYMAN

What first inspired you to get involved in the mining industry and study at WASM? Do you have any advice for today's students based on the experience gained in the course of your career?

Going into my final years of high school I had decided to study law, I hadn't even considered mining or engineering even though I had the pre-requisites for it. My brother had previously been on a camp for high school students at WASM in Kalgoorlie and had really enjoyed it, so when I was giving the opportunity to participate I jumped at the chance. It was the turning point of my young life and ultimately led to a rich and fulfilling career as a mining professional, investment banker and now non-executive director. WASM in Kalgoorlie, the only place to study mining engineering in WA back then, provided a supportive and close knit learning environment that encouraged and assisted students to gain practical experience during their university breaks (which had the added bonus of funding a very decent lifestyle during term!).

My advice for students would be to be flexible, resilient, determined and to embrace the opportunities that come their way with open arms and a can do attitude. Through my own experiences and that of fellow WASM graduates and peers in the industry I've observed that those who do really well take chances - they apply for positions that they're not sure they are comfortable doing, they look at assets through a different lens and they're prepared to sacrifice pay for experience. And network! Not only will the majority of opportunities come through that network, but I can't stress how many times I've not known the right answer to an issue, but some-one in my network does and they are just a phone call or email away.

What attracted you to Engineering?

I think I was first attracted to mining as an industry, it was a great lifestyle, had good job opportunities, included the change to travel internationally, was well paid and the mining companies encouraged students to study mining and actively supported them through scholarships, sponsorship of the students' association and provision of vacation employment. Then I looked at the career paths within mining and engineering was the best fit for my personality and abilities. It also helped that it was about the second highest graduate salary of all university course at the time and one of the highest employment rates for graduates! By mid final year of studies at WASM pretty much all of my classmates and I had graduate jobs lined up, and they were good jobs that would give us the experience we needed to grow into an engineer but also to get our WA First Class Mine Managers Certificate of Competency.

You started your own career in the early 90's when there was less encouragement for women to join male-dominated industries. The mining industry in particular had a reputation for a significant lack of gender diversity: What sort of challenges did that present?

When I was given a bit of a hard time when I was doing my underground time, I talked to some of the other graduates (who were men) and they also got a ribbing, so I assumed that all graduate mining engineers where put through the same initiation of sorts. I didn't look at it as a gender issue. Strangely enough, you didn't hear about gender or diversity as much back then – there just weren't enough women to even have that conversation, so it didn't much enter my

thinking as a possible cause of challenges. I had only a couple of instances that were gender related both of which occurred when I was a student - the first was a letter from an underground contractor in response to a request for vacation work, which stated they couldn't employ me as I was female and the second was a situation that arose while working underground, and my shift boss took care of that quick smart! I am very fortunate over my career to have had some great bosses, and worked with some really talented and skilled people that were willing to share their knowledge. They were mostly men and gender was never an issue. I just got used to being the only women around the table and did my job to the best of my ability. I'm often asked now about diversity around the board room table and I recognise that until we encourage more women into mining and into senior executive positions within the mining industry, it will continue to be a challenge at the board level.

You have varied your career, and moved into finance. Did any part of being a mining engineer help you when you transitioned into accounting?

Definitely! My career plan was to spend enough years as a mining engineer to get a

good practical experience base and a first class ticket, and then more into finance. Moving into accounting with a mining company was a great transition. As an accountant with that mining background I had a better understanding of what the numbers meant, and how they were derived, than if I'd gone straight into finance. It allowed me to progress much faster through roles and ultimately led to my role in mining finance with Macquarie Bank. And that combination of practical mining experience and finance skillset has allowed me to move into non-executive roles.

Tell us about your current job?

I am currently a non-executive director for 3 companies – Perseus Mining which has 2 operating gold mines and a near term development project in 2 different jurisdictions in Africa, Imdex Ltd which is a leading METS company based in Perth which provides real time subsurface intelligence to resource companies across the globe, and Gascoyne Resources which is in the process of developing its first gold mine here in WA, with a second asset already in their portfolio. They are diverse roles, which allow me to both contribute my current skillset and knowledge but also expand and

grow professionally. These roles have largely been sources through my network, either companies that I knew some of the board members or where a recruitment consultant has asked one of my network who they would recommend. I can't stress enough the importance of networks in your career development.

I also do some work as a consultant to resource companies, mainly pre-development assets, in helping them pull together feasibility studies, alternative development scenarios or looking at the financing alternatives for their projects. It's an eclectic mix of assets, countries and challenges that allows me to keep my knowledge current and relevant.

How did, if at all, your education at WASM help you to succeed?

Looking back, going on that camp to WASM in high school was one of the best decisions I made career wise! WASM gave me a sort after degree, practical experience, a great graduate role, and the confidence to go after a career in mining. As a WASM graduate I also gained a cohort of friends and peers, some of whom are now CEO's, directors and senior executives. WASM is very much a known and valued brand.



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Why did you choose mining as a career?

I was looking for a career that would allow me to combine my love of science & maths, with travel, variety & provide a good income. From about year 10 I realised I wanted to pursue some type of Engineering path, but it wasn't until early in year 12 when I discovered Mining Engineering as an option!

My mum was working at a computer training company at the time & was working in the booth at a careers day – where she happened to be placed next door to the WASM booth... Thankfully for me! She brought home all the brochures & I got hooked! At this time, the only place in WA you could study Mining Engineering was at WASM at the Kalgoorlie campus. This was a vastly different lifestyle to my Western Suburbs high school existence! Nevertheless, I applied for a Qantas bursary in Term 3 to go up to visit WASM in Kal & see some of what they do. I loved it & moved up there the following February & have never looked back!

How important is the WA School of Mines campus in Kalgoorlie to the industry?

My experiences at WASM Kalgoorlie will stay with me forever & are very near & dear to me. The friendships, the fun, the life lessons, the crazy adventures, the comradery felt with all the other WASM students was an immense bond.

The university education side of things were obviously very important in my learnings & gaining the degree. WASM has the geographical advantage that it is located in the heart of the historic mining industry in WA. This allowed us easy access for field trips, excursions, vacation work every holiday, and just to be part of a mining town from the get go.

But it was so much more than just an education in Mining Engineering. It's all the other things that you learnt along the way... how to build friendships & belong to a 'family' when you are all more than 600kms away from your own family, we learnt adaptability, resilience, mateship, persistence and independence.

I am so thankful for the education – both life lessons and engineering lessons, that I learned at WASM Kalgoorlie. It was a fantastic 4yrs that kicked me off on my career in mining.

Were there any disadvantages or advantages to being a woman while studying at WASM and if so what were they?

To be honest, I never really felt that different... Whilst at highschool I had an awesome group of friends that consisted of both genders & we had a diverse array of interests.

I believe this made my transition to WASM much easier, as I was one of only 4 females in my year of approx. 100 students in 1st year. There were some fantastic ladies in the years above & below, many of which still remain as close friends today.

How do you balance Family life and a career?

This is definitely a daily juggle for me, as it is for every working parent, however in my experience it still seems to impact the mother more resoundingly.

For about a decade after having children I worked in roles that I could do in Perth, with part time capabilities and that were flexible so I could deal with the early toddler years, Kindy and beginnings of school, school holidays, and when children became unwell. As my husband at the time was working FIFO and for a few years tried something different & had his own business (of which I also did the accounts for in my spare time) this worked for this period in my life where I could care for my children, support my then husband's business and his working lifestyle.

However, on reflection, I did feel as if I was only just holding onto my own career by the tips of my fingernails. I gained some fantastic experience during this period & enjoyed the variety that the consulting world provided, however I do feel like I missed out in the career progression & other opportunities that could have otherwise been attainable had I balanced things a little differently.

I have been extremely fortunate to have my parents support in keeping my career on track whilst being primary carer for my 2 children. Since going back to work full time in 2015, they have been pivotal in providing me the opportunity to balance family life and career.

Tell us a about your current role in South32.

I have been a part of the South32 team for 2.5yrs & have enjoyed the experience, challenges & the learnings along the way. I truly value working in a resources company built around a single idea that in a rapidly changing world, we have an opportunity to make a difference, from the ground up.

I initially began with South32 in the Planning & Development group, based in Perth and doing the Asset (Strategic) Planning for Illawarra Coal. It was a huge learning curve for me – working full time again, underground, coal, longwalls, all new to me! But the supportive team & positive environment saw me rise to the challenge & I enjoyed engaging with the multitude of functions that this role entailed – anywhere form Supply, the Operations, Projects, Finance, Community, Environment & Sustainability, Marketing, Closure Planning, etc.

WASMA EVENTS

Also whilst in the Perth office I got involved in a multitude of other activities & initiatives that are of importance of interest to me, such as the Employee Engagement Committee, Diversity at South32, fundraising events, a Lean In circle, Mentoring, University Careers Fair, and so on!

About 6mths ago, I was ready to tackle my next challenge & try something new. Though as I had considerably enjoyed my time within South32, I wanted to stay within the company. I was fortunate to then be offered two excellent roles, one based in Perth and one based on site - rather different from each other, but both fantastic opportunities! After much deliberation, self-analysis & consideration, I made the leap & accepted the opportunity to move to a site based role in my first ever leadership type role! It was a very daunting, yet thrilling opportunity.

I have thoroughly enjoyed getting back to site & getting

my boots dirty again. Although it took me awhile to manage the juggle between DIDO to Perth, my manager & team have been extremely supportive in allowing me to work 1 or 2 days per week from the Perth office, therefore limiting my time away from the children in Perth to 2 nights per week (where 1 is to start high school in 2018!)

The scope of work that I am now involved in is vast, ranging from the pit, to the plant and mobile workshop. The experience I am gaining is significant & the activities I'm getting involved in are considerably stretching my knowledge base & I am thoroughly enjoying my time being part of a positive & productive mining team.

As I stated in the work life balance answer above, I wouldn't have been able to do this role as easily if it weren't for the amazingly supportive parents, who move into my house to mind the kids those nights I'm working on site. Our western culture rarely empathises with anyone who might fail at a task, project or a particular job. Do you believe you can learn from your failures?

I believe that to fail is to have the chance at a new beginning. To know that you tried something, analyse what didn't work, pick yourself up & try something different!

There is so much that can be learnt from understanding the "why's" that comes with failures, and providing that you reflect on what went wrong, or what could be done better next time, then similar mistakes can be avoided in future.

Its part of the cycle of improvement. Whether it's a system, a process, an action, or an activity – when a failure occurs, if the root cause of the failure can be identified, then the opportunity to make an improvement on the next occurrence is more likely.

Would you encourage your daughter to go into the resources sector?

Absolutely! If it was something she was interested in, I would encourage her to follow her dreams & get involved. Although there is many initiatives & business focus on increasing diversity & inclusion, we as an industry & society as a whole, still have a very long way to go.

I encourage both my children to do what they are passionate about - then as the saying goes, they will never have to work a day in their life! If following their passions & interests means either of them go into a nontraditional industry for their gender, then I will fully support them & encourage them to stay determined & focussed to follow that path. I have thoroughly enjoyed my career in the mining industry & continually explain to them the options, variability & opportunities that it beholds.



While efforts to introduce gender diversity in Australia's mining industry have come a long way in the last 50 years, still, for every 87 men in Australia's mining industry, there are only 13 women. It's this gap that She's Empowered founder Kym Clark has been working toward changing for the four years she has been in business, supplying high vis workwear and creating an advocacy for women in industry.

Until She's Empowered came onto the market, there were no maternity workwear options for industrial workers. "Women work in all areas of mining, from underground and open cut roles to support services. Mining women deserve to wear a well fitted uniform just like they can in any other industry," she told us.

Some of the biggest names in mining have embraced Kym's vision and commitment to a more inclusive working environment including BHP and Anglo American, with She's Empowered's shirts, cargos and the maternity range recommended as a preferred uniform brand.

In fact, when BHP was knocked back by major workwear manufacturers to design a new female jacket they wanted to introduce for their staff, Kym accepted the challenge, resulting in the new Lucille jacket that is being released next month. Always asking questions and challenging the status quo, her range continues to grow as does her customer base.

MENTORING

When I reflect on how I have established my own career, I look to people that influenced me. Although I can name some key mentors that guided me through some tough junctions, this was never formal and I have often learnt more about what not to do through observation or mistakes.

On my journey, it was also evident that peer or manager guidance has often served more their purpose than my own and rarely does someone offer "free" advice without an underlying motivation.

The alternative to this "learn from mistakes" pathway is harnessing the use of Mentors.

Mentoring is a critical element of personal and professional development. It enables the safe sounding of ideas and options before action. The Mentee gains greater insight into the potential consequences (positive and negative) of a decision through another's experience.

We often hear it said that our industry is small and network connections are close. Although this is a strength of our sector, it can also constrain the conversations being held when we may doubt discussing our thoughts or decisions in fear of judgement.

A structured mentoring program offers a conduit to sound our ideas in a safe environment and ultimately build confidence, share knowledge and encourage sound decision making.

It is a rewarding legacy to leave to the future talent of our industry and I encourage you to consider this important contribution as a Mentor to future graduates.

STUART TONKIN

BEng (Hons) Mining WASM



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