aqa
Aggregate News
AGGREGATE & QUARRY ASSOCIATION OF NZ

A jam jar packed conference

Sorry if you missed QuarryNZ – it was a heck of a conference.

We are using this edition of Aggregate News to give you some insights; for those who did attend, it will provide a reminder of some of the key takeaways.

I was pleased to kick off the conference with my report on the AQA's activities for the past year.

That included working through a change of Government with the opportunity to revise policy settings that have long beset our industry. I acknowledged the extra effort our CEO, Wayne Scott and the small AQA team have put in to ensure our new political leaders are fully aware of the changes required so we can provide them with the quarry resources needed for their infrastructure, roading and housing objectives. Both the Resources Minister Shane Jones and Infrastructure and RMA Reform Parliamentary Under-Secretary Simon Court addressed our conference; a further signal perhaps that our industry's importance is finally being recognised.

I finished my address by hoisting a kilogram jar of aggregate and suggesting we all get one and wave it in front of anyone complaining about your quarry. We each effectively use one kilogram an hour in building our homes, communities and country.

Using this line can supplement the earlier metric the AQA used – that the cost of aggregate doubles after the first 30km it travels (thus proximate quarries are required in the area the aggregate is needed).

A confirmation that this message has been received came when Rotorua's young Mayor Tania Tapsell used it in her address to the conference. As you'll see in our story on page 4, she had nothing but praise for our sector. I wish we could clone her and install her in mayoral chambers around the country.

Mind you, the first of our two keynote speakers, AI guru Justin Flitter, showed how AI is now creating anyone you want. Fancy a chat with Marilyn Monroe?

More importantly, he's advising us in the quarry sector to get all of our staff on board with AI technology. There are already autonomous machines operating in US quarries and given the rapid advance of this technology, they will soon be here. Half of New Zealand businesses are now using AI. Justin's message was that it's not going to take a lot of jobs but it will take over many tasks (see page 3).

Our other conference keynote was Australia's Jodi Goodall who gave a presentation complete with clips and photos from a US rock festival which turned into a riot. Her message was that the festival was a failure of leadership and that disastrous consequences can happen in a quarry if leaders don't set the right example (see story page 2).

That provided major food for thought as did the Infrastructure Commission/GNS Science presentation on their just released quarry opportunity modelling report (see story page 5). We learned other regions are starting to ask for such modelling. Has your region done so?

I'm also still distilling some of the welter of technical information imparted at conference, some of which our Technical Adviser Mike Chilton reports on in page 6.

All in all, we had more to absorb in Rotorua than you could shake a stick at. Find a jar of aggregate and start shaking that instead.

Jayden Ellis
Chair, AQA

Don't be a Limp Bizkit on leadership

What's the link between rioters at a rock festival and a quarry? Australian risk consultant Jodi Goodall says both come back to leadership. "How we make people feel is how they respond."

Goodall outlined to the QuarryNZ conference how the Woodstock 99 festival – which saw two deaths, 8000 injuries and multiple sexual assaults, was headed for disaster before it began.

The two organisers had lost money in an earlier festival so put making a profit ahead of any other consideration. She said when a poor emotional tone is set and put alongside bad environmental conditions, disaster is likely to ensue at a rock festival or rock quarry.

Woodstock 99 was not held on the grassy slopes of the original 1969 festival, but on a former air force base with barbed wire fences to keep out gate crashers. It had mostly concrete surfaces with no shade and temperatures rose above 38 degrees. Insufficient water was provided and the one retail company on site charged $8 a bottle – the same price as beer. Food was also expensive, toilets overflowed and people were soon sick as well as hot, hungry, broke and tired.

Heavy metal band Limp Bizkit then appeared singing their hit single Break stuff. "That's exactly what the crowd did".

Facilities were vandalized, fires broke out, women were groped and raped with little intervention by security staff, many of whom had only three hours basic training.

Jodi Goodall said while some people might think this was all a far cry from what happens in a quarry, this missed the learnings.

"How we make people feel is how they respond," Jodi told the QuarryNZ delegates.

She said people sometimes say it takes five years to change an organisation's culture; at Woodstock 99 it took three days.

No Limp Bizkit leaders here. Jodi Goodall joined a panel discussion following her address with from right: Paul Hunt, Andre Nair and Joe Hunter.

"It starts with the environmental conditions and the tone you set. We often match what our leaders expect."

People in leadership roles need to drop down to the level of their lowest workers to really understand the culture of a workplace.

In a panel discussion on the topic after Jodi's address, WorkSafe's Chief Inspector in the High Hazards Unit, Paul Hunt said he'd done worker surveys in a past role. He found he had a better view of how things were going on site than his workers did. As hard as this was to do, efforts to measure workplace culture were invaluable.

"Managers by far and away have the most influence on sites."

Blackhead Quarries manager Joe Hunter said workplace culture was driven from the top. His company tried to make it like a family environment.

RedBull Powder's Andre Nair said fostering good safety outcomes require trust – and that included a belief among workers that when issues are raised they would be addressed.

Jodi Goodall said there was an ongoing battle between making a profit and being responsible for people. If it was only a production metric it drove a bad safety culture, such as that seen at Pike River with workers putting bags over gas monitors.

Paul Hunt said conflicting production and safety measures were seen all the time by WorkSafe. "The objective is safe production. Don't compromise that." **AQA**

The future is here

Understand Artificial Intelligence (AI) in your quarry business – or fail. That was the message opening the QuarryNZ conference from Justin Flitter who founded NewZealand.AI in 2017 to help its adoption.

Get on board with AI now or be lost, says Justin Flitter

Flitter says since tools like ChatGPT began emerging 18 months ago, it has been used by a billion people. In June, Meta (formerly Facebook) introduced its AI product to hundreds of millions more people. These used generative AI to analyse data set patterns.

Another form of AI had reincarnated Marilyn Monroe as a hyper-real AI-generated version of the late actress, with her able to talk in her signature voice to millions of people at once.

AI meant that no one needed to start any task from scratch anymore. Doing a Google search could now be replaced by AI providing you your digital assistant, your strategist, content creator and proposal writer.

More than 50 percent of New Zealand businesses were already using AI, although it is 80 percent in Australia.

"We need to get a wriggle on."

Autonomous quarry machines are already operating in the US with one quarry using a fleet of 100 tonne Caterpillars. It was also being used to provide virtual barriers which protected workers from machinery using cameras and alerts.

"Imagine a quarry where every machine was connected to AI."

Amazon is now using 700,000 humanoid robots to pack parcels and many such manual jobs were at risk through the automation of such tasks and back-office functions.

However, Justin says predictions of AI taking 40 percent of jobs were not correct.

"AI is not here to take your job for the most part. It's here to help with tasks."

A Taranaki laundry had spent $5 million on automating its processes with AI and has retained its 55 workers. There were predictions in Australia that AI will create 200,000 jobs by 2030.

Quarries need to provide AI training to all their employees so they can keep up with the technology.

"Our AI journey is just beginning," he says but the pace of change would continue to be remarkable. For example, it was predicted that by the end of next year, 95 percent of marketing content would be produced using AI. Justin screened a Volvo car commercial which had been generated in just 24 hours.

Justin was asked what parents should advise their children when discussing which careers to follow? He says just foster their curiosity. The world would still need lawyers, doctors and other professions – but all jobs will change with the use of AI.

Knowledge was now free. "How you interpret it and use it is the skill."

Quarry industry veteran Kerry Reilly asked what could possibly go wrong given all that AI can do? Justin acknowledged there are risks and cited a Singaporean finance worker who had paid $25M into an account having been asked to do so in a Zoom with his CFO; in fact, the CFO was a deep fake.

The biggest risk was posed by workers bringing their own AI tools to work and using them. To counter that, companies needed to adopt their own AI tools and rapidly.

However, he says the benefits far outweighed the risks for the quarry sector and all other industries. AQA

Rotorua's Mayor Tania Tapsell at QuarryNZ's opening night Terra Cat dinner

Mayor hits the mark

Rotorua's Mayor Tania Tapsell gave what some regard as the most supportive and encouraging speech ever heard when she spoke at the QuarryNZ conference in her city.

The 31-year-old first-term mayor told the Terra Cat opening night dinner that the quarry industry was critical to her Council's Infrastructure Strategy.

She told delegates she had been "blown away to learn the magnitude of the importance that your work has to us all" on learning every Kiwi uses the equivalent of one truck load of aggregate a year.

"Your work unlocks and delivers the strong foundation on which our economy can grow. Everyday Kiwis travel on the roads, walk on the footpaths, learn and work in the buildings, that have been built on the foundation of your work. It starts, with, you. And your work is very valuable."

Mayor Tapsell acknowledged many at the conference had dedicated their lives to the quarry industry and thanked the new talent choosing it as their career pathway.

She said Rotorua had 1000 kilometres of roads, 383km of footpaths and 52kms of shared pathways helping connect its community.

"All have required the resources that your industry provides. So just know that we appreciate and acknowledge the skills and expertise that you bring to making our places better, for everyone."

She said her Council needed to provide the physical infrastructure of Rotorua now and into the future as the district grows. It had developed a 30-year Infrastructure Strategy to support that growth while maintaining and renewing existing infrastructure.

Rotorua Lakes District Council had just adopted its 10-year Long-term Plan to invest around $566 million into core infrastructure to support its strategy.

"Quarries are crucial to achieving the core objectives of our Infrastructure Strategy, and the construction sector in general," said Tapsell. She outlined several reasons:

- Quarries provide a steady and reliable source of raw materials such as stone, gravel and sand, essential for various construction and civil works projects
- Without quarries, the construction of such infrastructure would be significantly impacted if not impossible
- The need for more homes in a housing crisis relies on the quarry sector for strong foundations
- It generates employment opportunities and contributes to the local economy through taxes, royalties, and business revenues and supports related industries such as transportation, equipment manufacturing, and construction services
- While quarrying had some environmental impacts, modern quarrying practices strive to mitigate these effects through measures such as land reclamation, dust suppression and habitat restoration

She said her Council is aware that it is increasingly challenging to secure resource consents to operate quarries.

"While everyone expects to be able to access the core services that are supported by quarry materials and operations, some people want quarries to be located away from the places we live. You know, and I know, that doesn't make any sense. The closer a quarry to the works, the better."

She said the challenge was to ensure the on-going reliability of materials produced by quarries in a cost-effective way, while also protecting our environment and considering neighbouring residents.

"I leave you with words I began with: In all places, at all times, we are only as strong as our foundations" **AQA**

Quarries can reduce unaffordable borrowing

Estimates that New Zealand needs $1 trillion spent on infrastructure are unaffordable, and better supply from quarries is one way to reduce the cost, says the Infrastructure Commission.

With rock comes opportunities, says GNS geologist Matt Hill.

Its acting CEO, Geoff Cooper, told the QuarryNZ conference that an ASB bank assessment of a $1000 million infrastructure spend would require a 21 percent increase in tax rates or a 98 percentage point increase in the nation's debt to GDP ratio by 2050.

Neither were affordable, so infrastructure costs had to be streamlined alongside better project selection and better use of existing infrastructure.

Cooper said a long-term perspective was required and growth scenarios are needed to allow for more productivity and the holding down of costs.

"As cities grow, reverse sensitivity pushes quarries further and further out – increasing aggregate cost."

Quarry resources also needed to be protected, he said, noting 33 million tonnes of potential new aggregate for Auckland had recently been sealed under a new sub-division.

Our infrastructure spending was already hugely inefficient compared to most OECD nations. "The location of our quarries really matters," he said.

In 2021, the Infrastructure Commission had released an Infrastructure Resources Study that found consent conditions often limited the supply of aggregate.

It then commissioned GNS Science to identify potential extraction opportunities close to four high-growth areas: Auckland, Tauranga, Wellington and Central Otago. This report was released in June.

GNS geologist Matt Hill said GNS had since worked with the Tasman district on similar mapping and this was about to be released as well.

He said the aggregate opportunity maps looked at where resources lay and what the land they sat under, was currently used for. They also considered community sensitivities such as whether there were schools or hospitals nearby and the feasibility of extraction.

"Fiordland rock is not going to be transported to Dunedin."

He said while the cost of transporting aggregate is usually said to double after 30km, work by the Infrastructure Commission modelled on Auckland showed the distance was 23km when using 11 tonne trucks.

Distance from markets was a key consideration along with avoiding community sensitivities. "It's a Goldilocks thing – not too close, not too far."

Matt stressed that the GNS work was not modelling resources for extraction – just where potential opportunities might lie. Much community engagement would be needed before any resources now identified might be tapped. **AQA**

AQATechnical update

QuarryNZ – a technical blast

As conferences go, the recent (and very successful) event in Rotorua was filled with sessions for those with a technical bent. We started with a couple of hours working our way through the final draft of the M04 spec. Big thumbs up to the AQA Technical Committee for all its work here.

The NZTA prepared a draft M03 spec and we had our first official working group meeting on this in Rotorua. The Committee has been working on what it would like to include/exclude, as well as discussing the challenges of different source material, particularly alluvial gravel. The spec is likely to include process controls similar to M04. The Transport Agency is now keen to write an M03 sub-base spec given that for basecourse has been ratified and will be published later this year.

We also had Rodney Pilbrow of Pilbrow Surveying give us a history of global navigation satellite systems – and their increasing role in the automation of mining and quarry sites. He gave a succinct explanation of sources of errors and managing them. The explanation he gave of correction services and the importance of proximate ground control stations was very helpful in understanding this technology that nowadays is taken for granted.

Garth Taylor from MIMICO filled us in on Metso's digitisation initiative including the system Metso crushers use to communicate data with remote telemetry and the new IC remote system that sets up a Wi-Fi network at the crushing site so the crushers can talk to each other and the operator's phone app.

Daniel Webber from CDE Group spoke on harvesting and using process data to monitor performance, aid planning and predict parts replacement. The OptiMax System maximises productivity by optimising the plant and feed settings to work the plant as hard as possible. He advocated for the use of technology but only where it was going to be used for a specific purpose and not at the expense of other non-technology wins (e.g. managing excessive downtime from a stressed part of the plant) and explained how some laws restrict the use of fully autonomous solutions.

Mike was joined at the QuarryNZ conference by his wife Susannah and children Meg, Henry and Edie.

Brendan Littlewood from Orica gave an excellent presentation on Orica's work on Fly Rock modelling.

The Infrastructure Commission/GNS Science presentation on the survey of aggregate potential was also well received and it was good to hear the work is already extending beyond the first five regions surveyed.

New Zealand Quarry Database

Since its launch a couple of months ago, there have been more than 350 views of the database.

Fulton Hogan, as one major player, is currently reviewing and editing its site information. A bug in Koordinates has prevented data update – new listings may be required. A contractor will audit the database and refine the information listed for each quarry.

AQA quarry products training

As AQA Technical Adviser, I am working alongside CETANZ members and the AQA Technical Committee on the quarry products training package for NZ. **AQA**

Mike Chilton
Technical Adviser, AQA

Aggregate & Quarry Association of NZ
PO Box 10668
Ground floor 93 The Terrace
Wellington 6140
0800 469 272

Chief Executive Wayne Scott
wayne@aqa.org.nz
021 944 336

www.aqa.org.nz