

Gladstone Aluminium: Inside Operations

Celebrating people, progress and partnership
across Boyne, QAL and Yarwun

Welcome to *Inside Operations*, where we share what's happening across Boyne Smelters, Queensland Alumina Limited and Yarwun refinery.

From our Site General Managers



Trent: At QAL, innovation and collaboration continue to play an important role in how we improve safety, reliability and performance. This edition highlights the growing use of drone

and remote inspection technology, which helps reduce the need for people to work at heights, enter confined spaces or access difficult environments. It is a practical example of how new tools can support safer, more efficient ways of working while strengthening asset integrity across our site.

It was also pleasing to see so many scientists, engineers and technical specialists come together for the Gladstone Technical Conference. There is great value in bringing together the depth of expertise from across this region into one space to share and grow our knowledge across Rio Tinto's Gladstone Aluminium operations as we work through the opportunities and challenges ahead.



Shona: At BSL, we're constantly looking for ways to build our team's capability and take our operations forward. Four of our apprentices showed we're doing just that at the WorldSkills trades competition

recently, with three finishing on the podium against regional competitors. I'm proud to see our people being recognised for their skills and passion for their trades – developed right here in Gladstone.

This edition also shows how we're developing the next generation – from welcoming young students in the STEM-tacular Girls Program to our smelter, to explaining the alumina-to-aluminium process and our role in the integrated Gladstone value chain.

It's moments like these that bring our operations to life and show young people how they can be part of this story by developing careers in science, engineering, trades and industry.



Shane: At Yarwun, we continue to focus on safe, reliable operations while progressing practical opportunities to support a lower-carbon future. The next stage of our bio pellet work with SuperChar

is an important milestone, moving from trials toward operational demonstrations and assessments of different blends at our Gladstone alumina refineries. It reflects the collaboration across our sites and the potential to build a local supply chain that connects agriculture, industry and new technology in Central Queensland.

Thank you to everyone contributing to these outcomes across our sites. We hope you enjoy this edition.

Stay safe,

Shona, Trent and Shane.

Inside community

Song, dance and gathering on Country

Every year, one shirt tells a bigger story. To mark NAIDOC Week – Australia’s national celebration of the history, culture and achievements of Aboriginal and Torres Strait Islander peoples – Rio Tinto commissions an Indigenous artist to create an original design for limited-edition polo shirts. In 2026, that story belongs to Uncle Joe Butler.

A proud Gooreng Gooreng, Gurang and Gangulu-Iman man, Uncle Joe has been creating artwork since he was a child.

This year’s artwork, Celebrating on Land and Sea Country, continues that work of sharing and guiding. The painting centres on two brolgas, Gourvan, moving together across land and sea Country.

When Uncle Joe heard this year’s NAIDOC theme, the vision came quickly.

“When I hear a title, I come up with a vision in my head. Once I see the vision, I know where I’m going, and that’s where the story comes through.”

From that vision came a story of movement, guidance and gathering.

U-shapes represent hunters, our people, sitting together. The lighter blue reflects the monsoon rains that fill the billabongs. When the water rises, fish gather, and the hunters follow the brolga’s footprints to water.

“We go out, we catch the fish, we bring it back. When we come back to the centrepiece, that’s where we all gather.”

At the centre, white dots represent people sitting together, sharing food, and ensuring no one misses out. Darker orange dots mark land Country. Lighter orange reflects sand. Blue circles show billabongs. The footprints of Gourvan move across the canvas, guiding the eye and carrying the story forward.

Each painting begins from the centre and grows outward – just as community does. Marbling creates depth in the

background, then circles, line work and layered dots bring the story to life.

“When you look at it, you see the dots float. I see that three-dimensional effect.”

For Uncle Joe, culture is something lived and shared. He hopes those who see the artwork feel proud and drawn back to Country.

“When I pass on culture with my artwork, this is where people can learn something. They can learn something about our Country and what our people used to follow and be guided by.”

Still deadly. Always.



Across Gladstone and around Australia, wearing Uncle Joe’s artwork was a visible way for employees to take part in NAIDOC Week, sparking conversations about culture, learning and connection.

Locally, the week was marked through site-based gatherings and community events, bringing people together to listen, learn and celebrate connection to Country.





Inspiring the next generation of women in STEM

For 15 years, the STEM-tacular Girls Program at BIEEC has inspired young women across Central Queensland to become leaders in science, technology, engineering and mathematics.

As a proud sponsor of the STEM-tacular Girls Program, QAL partnered with BSL and Yarwun to host 44 students for a major highlight of their tour – proving that careers in STEM are popular, powerful and driving a sustainable future. The action-packed, five-day experience connects student curiosity with real-world green careers, encouraging Year 10 students to choose these subjects for their senior school pathways.

Advancing mud farming at QAL

During their site visits, students got a front-row seat to see some innovative environmental engineering at QAL's Red Mud Dam and learned how mud farming plays a critical role in rehabilitation. By using specialised amphibious

machinery to repeatedly turn over bauxite residue from alumina refining, the process accelerates drying, improves consolidation and enables safer, more efficient long-term land restoration.

Transforming alumina at BSL

The STEM magic didn't stop at QAL. Celebrating the strength of Gladstone's integrated aluminium value chain, the students crossed over to BSL where they toured Reduction Line 3 to learn about how alumina is transformed into molten, infinitely recyclable aluminium through electrolytic reduction.

With more than 60 years in the region, Gladstone Aluminium operations continue to play a role in supporting education and creating opportunities for young people to explore future pathways. By opening site gates and sharing real-world expertise through programs like STEM-tacular Girls, QAL, BSL and Yarwun are helping students connect their curiosity with practical learning, while showing how science, engineering and energy come together in the aluminium value chain.



Did you know?

Students even got to name QAL's newest amphibious excavator. Inspired by the movie *Wicked*, student Millee cleverly dubbed the machine "**Alpheba**", a brilliant fusion of chemistry (Al for aluminium), and Elphaba, our favourite trailblazer.

Inside industry

Australian aluminium takes centre stage at Parliament House

What does one of the world’s largest alumina refineries look like from above? Visitors to the Australian Aluminium Council showcase in Canberra had the chance to find out, with QAL bringing the scale, complexity and unique setting of its Gladstone operation directly into Parliament House through a 360-degree aerial virtual reality site tour.

More than 200 Ministers, Members of Parliament, Senators, government officials and industry leaders attended the event, which highlighted the strength of Australia’s integrated aluminium value chain, from mine to market, and the industry’s contribution to regional communities, jobs, manufacturing and economic growth.

Rio Tinto was represented by Armando Torres, Managing Director Pacific Operations Aluminium, along with other representatives from across the business, including QAL General Manager Trent Scherer and Owen Sun, Acting Technical Specialist, who shared the refinery’s role in the integrated aluminium value chain. Yarwun’s world-first hydrogen calcination project was also profiled as an example of a potential future low-carbon technology for alumina refining.



Nearby, mini aluminium ingots from BSL helped show how local alumina continues through the value chain to become aluminium used in everyday products and future-focused manufacturing.

Armando Torres said the showcase was an opportunity to bring every stage of Australia’s aluminium industry together in one place and highlight the important role Australian aluminium plays now and into the future.

Australia’s aluminium industry contributes \$18 billion annually to the national economy and supports more than 75,000 jobs, including thousands of families in regional communities like Gladstone. For Rio Tinto, the event was a chance to show how QAL, Yarwun and BSL are part of an industry vital to Australia’s future.



Did you know?

Australia is one of the world’s largest producers of bauxite, more than

100 million tonnes

a year, around a quarter of global supply.



Pictures: Australian Aluminium Council members and Owen Sun



Australia is the world’s largest exporter of alumina. Alumina refining generates around

A\$15 billion

in annual export earnings and supports the incomes of more than 75,000 Australian families.

Australia is the world’s sixth largest producer of aluminium and has

4 operating smelters.

Inside QAL

Taking flight: Drone technology delivers multiple benefits

Senior Project Coordinator Barry Purcell is the Chief Pilot for QAL's Remote Operated Vehicle (ROV) Program and has been instrumental in expanding the use of drone and remote inspection technology across the operation. Barry has identified where drones and remote-operated technologies can help reduce the need for people to work at heights, enter confined spaces or access difficult environments.

The program continues to build capability through advanced scanning and imaging technologies, improving the safety and quality of inspections that have traditionally required people to work in higher-risk environments. It also strengthens QAL's ability to inspect and monitor assets more efficiently, including internal inspections of settler and washer tanks.

During the recent Unit 3 shutdown, an ROV was used to complete internal visual inspections of tanks, providing valuable information without requiring personnel to enter. The next step is the introduction of the Voliro NDT

drone, a technology that will allow ultrasonic thickness inspections to be completed remotely on tanks, vessels, stacks and other difficult-to-access assets, reducing the need for scaffolding, rope access and working at height while providing high-quality inspection data to support asset integrity.



Barry is sharing learnings with team members from BSL through a Remote Pilot Licence course. The session included flying exercises designed to build capability in safely manoeuvring ROVs in confined and complex industrial environments. Only accredited ROV pilots are permitted to operate in industrial airspace, and the training reflects the ongoing collaboration between the Gladstone sites as Chief Pilots share knowledge, align practices and support the safe expansion of this technology across the region.

Do you know what's in your phone?

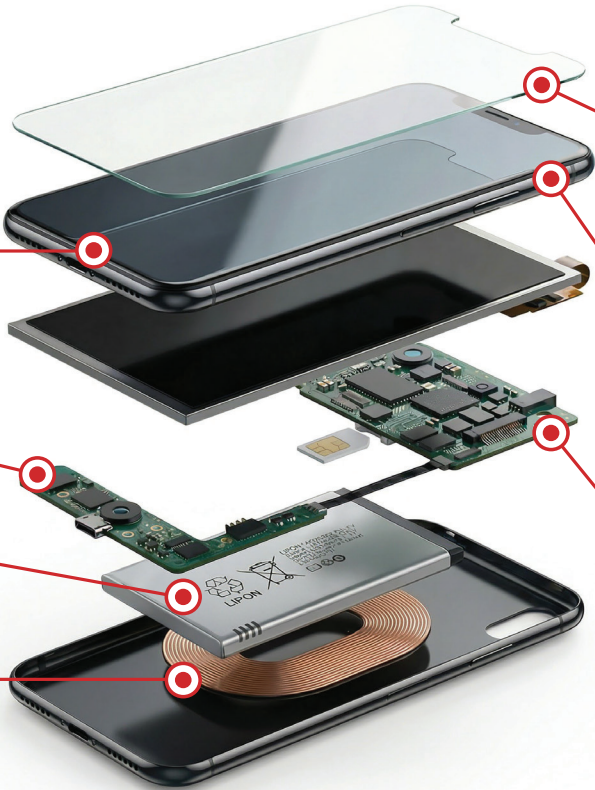
Anatomy of a Smartphone

Al **Aluminium alloys'** lightweight properties and electromagnetic shielding make them perfect for phone casings

B **Boron** is used in semiconductor doping for microprocessors and camera chips, and in some specialty glasses

Li **Lithium-ion** batteries are used because they last longer and charge faster

Cu **Copper** is in wires and circuit boards for its heat dissipation capacity, as well as thermal and electric conductivity



RioTinto

Li **Lithium** enables ultra-durable, scratch-resistant screens and high-performance camera lens

Al **Aluminium** is used for its electrical conductivity, strength, lightweight properties and ability to provide a beautiful finish

Li **Lithium** compounds are used in advanced semiconductor precursor materials

Inside Yarwun

Bio pellets take next step

A new agreement is helping move bio pellet work from trials to the next stage, supporting practical ways to reduce emissions from alumina refining in Gladstone.

Rio Tinto has signed a five-year agreement with Australian bioenergy company SuperChar Limited to supply locally produced bio pellets for use at Yarwun and QAL, marking an important step in exploring lower-emissions options for alumina refining.

Previous trials tested a range of bio pellet and coal blends and showed that, under trial conditions, bio pellets could replace up to 30 per cent of the coal used to generate steam in refinery boilers.

The agreement will enable operational demonstrations and further assessments of different bio pellet blends, ranging from 5 to 50 per cent, as a supplement to coal used in boilers at our Gladstone alumina refineries.

The bio pellets will be produced locally from bana grass at SuperChar’s planned production facility in the Gladstone region. At full contract volumes, this could reduce reported Scope 1 emissions by up to 90,000 tonnes of carbon dioxide equivalent each year, under Australia’s current National Greenhouse and Energy Reporting framework.

Beyond the technology, the project presents an opportunity to support a local supply chain that connects agriculture, industry and new technology in Central Queensland.

With deliveries expected to start in 2028, the next few years will focus on approvals, operational readiness and further demonstrations as the teams prepare for the next phase of work.

What happens next?

- SuperChar plans to establish a bio pellet production facility in the Gladstone region with an initial capacity of 35,000 tonnes per year.
- Bana grass planting from late 2026.
- Bio pellet processing to begin in 2028.
- Initial use will begin at Yarwun, followed by increasing volumes at QAL.



Did you know?

Bana grass is a perennial crop that can remain productive for more than 15 years and can grow to

7 metres tall, in ideal conditions.





Inside Boyne Smelters

Apprentices win medals at WorldSkills Regional Competition

Four Boyne Smelters apprentices have put their skills to the test on the regional stage, returning from the WorldSkills Regional Competition in Bundaberg with three medals and plenty of new experiences.

Electrical apprentices Lucas Rhodes, Zane Reid, Riley Underwood and Peter Russell represented BSL in the Electrical Installation and Electrical Control categories, competing against apprentices from across Southeast Queensland.

After two weeks of focused preparation and mentoring from former WorldSkills competitor and judge James Keen, the team arrived ready to take on the challenge. Their hard work paid off, with Riley winning gold and Zane taking silver in Electrical Installation, while Peter claimed gold in Electrical Control.

For Riley, topping his category means the competition continues, with a place at the national competition in Adelaide next year now in his sights.

“This has been an incredibly valuable learning experience,” Riley said. “Interacting with my mentors, trainers, and meeting new people in my trade from around the region has helped to develop my skills and confidence while I complete my apprenticeship with Boyne Smelters.”

The competition gave the apprentices the chance to sharpen their technical skills, work through real-world tasks and learn from others in their trade – experience they can now bring back to site as they continue building their careers.

A big thank you to James for his mentoring, and to the Automation Team for supporting James during the WorldSkills competition period. Congratulations to Lucas, Zane, Riley and Peter on a fantastic achievement.



Inside projects

A milestone built brick by brick

A significant 2.4 year renewal project was recently completed at BSL, extending furnace life, improving reliability and supporting safe, efficient anode baking.

Carbon Bake Furnace 3 was built in 1995 as part of the smelter's expansion. It 'bakes' the carbon anodes that are manufactured on site – each anode weighing over a tonne – and consumed in the reduction process to make aluminium metal.

The large-scale refurbishment involved rebuilding 48 furnace sections, including 432 flue walls, 46 head walls, four end walls and 2,400 furnace wall insulation blocks. It was the first complete replacement of the furnace's wall insulation since initial construction.

Delivered by a team of 73 people over the life of the project, the rebuild was completed with zero first aid injuries across 147,814 work hours, reflecting the focus, planning and teamwork of everyone involved.

General Manager BSL Shona Markham said the rebuild was an important achievement for the operation and the teams who delivered it safely.

"The Carbon Bake Furnace 3 Rebuild is a great example of what can be achieved through discipline, collaboration and care," Shona said. "The numbers are impressive, but the real achievement is the way our teams worked together to deliver a complex project safely and set the furnace up to support BSL for years to come."

For the Operations and Refractory teams, the project's true legacy is teamwork and collaboration.



Production Facts:

The rebuild involved the installation of more than **1.2** million refractory bricks, equivalent to over 12,000 tonnes of refractory material.

This is approximately:

- **1.5 times the weight of the Statue of Liberty**
- **5,100 fully loaded utility vehicles**
- **250 km of brickwork** if laid end-to-end, stretching from Boyne Island to beyond Rockhampton.

Share your feedback

Thank you to everyone who shared feedback on the last edition of *Inside Operations*. Congratulations to our previous survey prize winner, **Charlotte F.**

What did you think of this edition of *Inside Operations*? Share your feedback in our short survey and go into the draw to win a **\$500 voucher** to spend at a Gladstone business.



Scan the QR code to complete our short reader survey.