

An IsaMill™ was installed at Ernest Henry Mining to process magnetite from June 2011 to August 2013, and was later reconfigured into the concentrator circuit to improve existing copper concentrate production



## *Glencore Technology innovation unlocks potential of challenging ore bodies all over the world*

**A**s one of the biggest mining operations in Australia, it comes as no surprise to learn of Mount Isa Mines' (MIM) rich history pioneering technology and playing a significant role in the global mining industry.

Throughout the years, MIM and our employees have been at the forefront of developing processes and technology that improve efficiencies and keep mining operations viable.

So much so, for the past 30 years Glencore Technology has been dedicated to marketing our innovations around the world, as well as continuing to develop technology used in the metals and mineral processing industries.

Today, Glencore Technology manages innovations like the ISASMELT™ smelting technology, ISAKIDD™ copper

refining technology and the Jameson Cell flotation technology, to name a few.

In 1987, MIM started mining the Hilton (now known as George Fisher) orebodies which were initially trucked to Mount Isa to be processed through our Zinc-Lead Concentrator. At the same time, the McArthur River deposit was being developed but was facing metallurgical challenges to process the extremely fine-grained ore.

For both the Hilton and McArthur River orebodies, a new technology needed to be developed to process the ore into a concentrate material.

Dr Bill Johnson, who was head of Minerals Processing Research at MIM in the 1980s and 1990s, was tasked with finding a treatment solution for the extremely fine-grained McArthur River lead-zinc-silver deposit and to improve

the metal recovery at the MIM Zinc-Lead Concentrator.

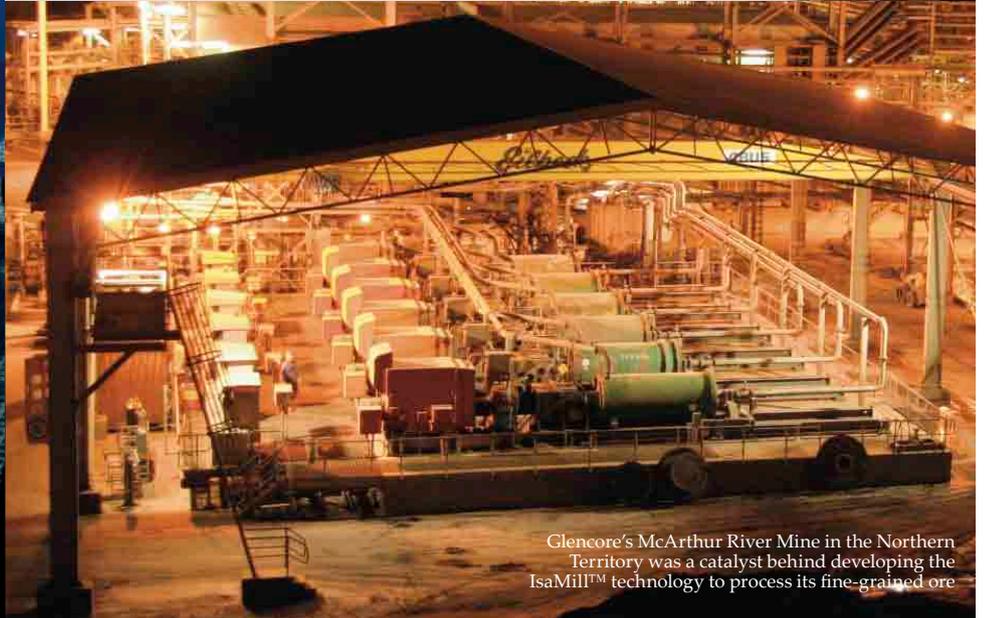
The barrier was having the technology to economically grind the ore below five microns, something the existing ball mills could not do.

Bill knew there would be a solution for economic ultrafine grinding, however it would not be found in the minerals industry. Instead, he researched manufacturing processes with small-scale batch mills and grinding specialists for products such as printer ink, paint pigments, pharmaceuticals and cocoa. These mills used very fine, expensive media stirred at high speed in a small batch mill.

This method offered a promising path forward to finding a solution. So Bill tasked his team to solve several problems; such as the scale required in mining



A small IsaMill™ in operation at New Zealand's largest gold producing mine, the Macraes Mine on the South Island



Glencore's McArthur River Mine in the Northern Territory was a catalyst behind developing the IsaMill™ technology to process its fine-grained ore

versus manufacturing mills, the different type of media required and lowering the production cost, to effectively apply this method to the minerals industry.

Bill and his team partnered with the German manufacturer, Netzsch and developed what is now known as the IsaMill™. Test-work on the MRM ore started in 1991 and by January 1992 a small pilot-scale mill, the LME100 (55 kilowatt), had been designed and installed at MIM.

Joe Pease, Zinc-Lead Concentrator Manager at the time, then worked with Bill to develop and apply the IsaMill™ from small-scale to a full-scale operational grinding technology. After years of development and testing of prototypes, the IsaMill™ evolved to the scale that was implemented throughout the MIM and MRM operations.

In 1995, the first full-scale M3000 (1.1 megawatt) IsaMill™ was installed at the MIM Zinc-Lead Concentrator. The Concentrator team applied the technology to several parts of the circuit in a staged regrind and flotation approach to achieve a high increase in metal recovery.

After many successful years at our operations, the IsaMill™ was fully commercialised and available to the mining industry in 2003 by Xstrata (now Glencore) Technology, where one of its first successes was the introduction to the South African PGM industry where the M10,000 IsaMill™ was developed

The first IsaMill™ installed outside of the MIM Group was at KCGM Fimiston in Western Australia in 2001. Today, there are more than 130 IsaMills™ installed around the world, with further development improvements still being worked on by Glencore Technology in

partnership with Netzsch.

The IsaMill™ is a major advancement in processing technology and is the most energy efficient, highest intensity large-scale grinding machine on the market.

One of its strengths includes its ability to use inert ceramic grinding media, which leads to improved metallurgical performance when compared with conventional steel media.

Most importantly, the development of this technology has supported the feasibility to mine and process challenging orebodies, such as our Mount Isa zinc-lead-silver and McArthur River deposits.

In 2016, Dr Bill Johnson and Joe Pease were inducted into the International Mining Technology Hall of Fame for their significant contribution to the mining industry through the development of the IsaMill™. 