

Cyanide Detox
Group



Bringing a wealth of experience to maximise safety and efficiency

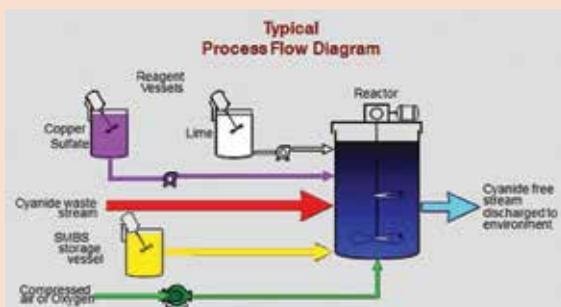
“The provision of detox equipment systems and service is an area of the gold mining industry that has not had enough attention”

The entire team at Gekko, in particular our Cyanide (CN) Detox Group, is immensely proud to have been independently nominated for this award. It is even more exciting to have *Minjng Magazine* readers vote the nomination as the winner of the 2012 Environmental Excellence Award for Gekko’s CN Detox Group,” said Sandy Gray, Technical Director.

Gekko Systems is dedicated to improving processing outcomes for mining companies, with a particular interest in highly capital-effective and low environmental footprint plants. The company has been instrumental over the past 10 years in developing and applying alternative, low-energy flowsheets using gangue rejection and pre-concentration concepts to minimise comminution.

In 2011, Gekko’s Technical Team, located across offices in Canada, Chile, South Africa and Australia, and led by Sandy Gray, reviewed other environmental improvement opportunities and this resulted in the creation of the company’s CN Detox Group in 2012. “Consequently, the environmental focus of this award is particularly important to everyone at Gekko,” he said.

SO₂/air cyanide detoxification process



Gekko is a previous recipient of a *Minjng Magazine* award, being the winner of the Beneficiation Award in 2005 for the InLine Pressure Jig – an innovative low-energy, low-footprint, continuous gravity-separation device.

“We believe that the provision of detox equipment systems and service is an area of the gold mining industry that has not had enough attention. It forms a key factor in the social licence to operate especially for gold mining companies. Accordingly, Gekko’s CN Detox Group will be focusing very much on providing a strong service and support programme for Gekko’s customers,” said Gray.

Gekko’s CN Detox Group was formed in conjunction with the global knowledge leader in this field, Randy Agius, and was officially launched in July 2012. Agius has been the pioneer of cyanide detox technology. He spent 32 years working for INCO, which first developed the technology.

He then established his own cyanide consulting business, R & C Environmental Consulting Services. Agius approached Gekko in 2012 to establish a dedicated cyanide detox group within the Gekko organisation. “Gekko’s market exposure with intensive cyanidation technology made it attractive to join the two technologies together,” said Agius.

Gekko’s global footprint, modular design and construction capability will also provide additional value into the combined group to offer clients a specialised package for greenfield projects, from test work through to installation and ongoing service of a fully

engineered modular system. The brownfield projects will be more focused on the ongoing audit and optimisation of current cyanide detox systems, operating under Gekko’s Advantage Plus Service Support agreements.

CYANIDE DETOXIFICATION

The widespread use of cyanide to leach gold and silver from mineral deposits is an efficient process but must be properly managed and standards maintained to ensure its effectiveness.

The gold mining sector has been very active and progressive in managing this issue through the development of the International Cyanide Code, which manages all facets of cyanide usage including transport to and from site of the lixiviant by contractors. There are 36 gold mining companies that are signatories to the International Cyanide Code.

Cyanide has a high acute toxicity to aquatic life, birds and animals, as well as being very toxic to humans – inhalation exposure can be fatal. Because of this, it is critical that the used liquor is properly detoxified before being discharged to a tailings dam or other containment facility. Ill-managed tailings dams have led to leakage disasters such as the one at Baia Mare in Romania in 2000. Due to the elevated cyanide levels of the tails the spill contaminated waterways.

There are several major risk scenarios for cyanide use in mining described in the Code (ICMI 2006) that need to be addressed through site-specific plans:

- exposure of workforce to cyanide in relation to manufacturing, transporta-



- tion, handling and storage, and all operational and decommissioning activities;
- protecting worker health by identifying cyanide exposure pathways to workers, operating and monitoring facilities safely by eliminating or reducing sources and having emergency response plans in place;
- exposure of humans (other than workforce) and other biota to releases of cyanide from manufacturing, transportation, handling and storage, and all operational and decommissioning activities;
- exposure of livestock and other biota through releases of cyanide in solution to surface or groundwater which subsequently may be ingested.

A mining operation that incorporates a specifically designed detox circuit operates with great efficiency. Expert optimisation of process conditions, based on laboratory results and on site tests, is critical to achieve efficient cyanide detoxification.

- A well-engineered detox circuit will:
- be cost-effective, through reducing costs

- associated with waste management;
- meet environmental permit requirements and responsibilities, and therefore minimise risks and liabilities;
- extend life-of-mine and maximise gold recovery through optimisation of operations.

EXPERTISE AND KNOWLEDGE

Gekko's world-leading experts in cyanide detoxification are available to help clients establish or improve existing detox circuits. Capabilities exist to provide a comprehensive consultant service including:

- laboratory test work and professional recommendations;
- process design and engineering;
- manufacturing and installation;
- commissioning and staff training;
- auditing, ongoing optimisation and online monitoring (if requested).

Gekko draws on the latest technologies and methods for detoxifying cyanide, including SO₂/air, H₂O₂ (peroxide) and Caro's Acid processes.

The company understands the benefits and pitfalls of every detox method and

offers specialist advice using this knowledge.

The Cyanide Detox Group will gather and study mine-specific information and requirements. Ultimately, Gekko endeavours to achieve environmental obligations at the lowest total cost.

DIRECT SCALE-UP

Gekko's laboratory test work and optimisations are completely scalable to full plant-sized detox operations.

Gekko's chemical engineering team has benefited from working with Randy Agius, who has brought and shared his expertise and experience of 120 proven global installations.

Its in-house laboratory results can be directly scaled up to work with the same effectiveness in regular plant operations. This will save time and money when setting up a cyanide detox system.

Over the last few decades, innovations have advanced cyanide detoxification processes for the global mining industry.

Now, as part of Gekko's Cyanide Detox Group, the accumulated wealth of experience and intellectual property are available for clients to take advantage of. Gekko's cyanide detox recommendations are wholly based on Gekko's unique know-how of cyanide detox processes and core technologies.



Detox pioneer Randy Agius (left) joined Gekko's Cyanide Detox Group in 2012. He is pictured with Sandy Gray, Technical Director

“Gekko endeavours to achieve environmental obligations at the lowest total cost”

The detox circuit at Ballarat Goldfields, designed in collaboration with Randy Agius and built by Gekko Systems