

Earth Day spotlights importance of environmental management of tailing dams

Recently, tailings dams, which store the often toxic by-products of mining operations, have been failing at an alarming rate, with five major tailings dam failures globally in the first quarter of 2025.

By [Alastair Bovim](#) 22 Apr 2025



Source: © Mining Zambia Magazine [Mining Zambia Magazine](#) On 18 February 2025, a catastrophic tailings dam collapsed at the Sino-Metals Chambishi Mine, in Zambia, flooding the surrounding area and Mwambashi River with 50 million litres of acidic effluent.

On 18 February 2025, a catastrophic tailings dam collapse at the Sino-Metals Chambishi Mine, in Zambia saw 50 million litres of acidic effluent flood the surrounding area and into the Mwambashi River.

This was more than just a flood – 20 Olympic swimming pools' worth of toxic effluent polluted the water supply of Kitwe, a town of 500,000 people.

The consequences are ongoing: aquatic life has been decimated, livestock and farmlands are affected, and for the local communities, the effects are just unfolding.

Then there is the now-infamous 2019 Brumadinho tailings dam disaster in Brazil, where 270 people lost their lives after 26 million tonnes of noxious effluent flooded the region.

Six years on, the environmental and social damage remains. Respiratory illnesses, poor soil quality, and the collapse of local agriculture continue to affect the community.

The Brumadinho spill casts a long shadow, but introducing new global safety standards is one positive outcome.

In 2024, BHP, a parent company of the mine, was ordered to pay over \$30bn in damages.

These examples highlight the far-reaching and multi-dimensional impact of tailings failures on human life, ecosystems, local economies, and even corporate reputations and finances.



Proactive risk management

Tailings dam failures are rarely caused by a single factor.

Climate change-driven higher rainfall, inadequate monitoring, and legacy management practices contribute to instability.

While the solutions are complex, the first step must be a shift in approach—from reactive to preventive.

Traditional risk registers are often viewed as tick-box exercises. We need dynamic, science-led risk management practices supported by real-time data.

That means continuous monitoring, early warning systems, and mitigation strategies that are not only feasible but financially justifiable.

Key to the success of such an approach is collaboration among critical stakeholders, including mine operations and engineering staff, external consulting engineers, and specialised technology providers.



SUSTAINABILITY

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Joe Mosupyoe, 27 Mar 2025



From tick-box risk to real-time action

The mining industry has a clear opportunity to embrace innovation, prevent future tailings dam failures, and lead the way in sustainable resource extraction.

There are four areas of action:

1. Reimagining corporate risk management

Risk assessments must become rigorous, real-time processes, not hurried pre-board meeting formalities. The return on investing in risk understanding and mitigation far outweighs the cost of doing nothing until disaster strikes.

2. Leveraging technology for early detection

AI and real-time monitoring tools are essential to detect anomalies and risks before they escalate into disasters. Through early warnings, these tools empower engineers to act on credible, timely insights, reducing the risk of catastrophic failures.

3. Building trust through community and collaboration

Involving local communities in the monitoring and assessment processes can provide valuable insight and foster a sense of shared responsibility. This collaborative approach can help identify risks early and ensure that mitigation measures are effective.

4. Driving environmental stewardship

Beyond preventing disasters, mining companies must work actively to reduce their environmental footprint through water treatment innovations, ecosystem restoration, and adoption of pollution-reduction strategies.

Earth Day

The spill in Zambia may be fading from the headlines, but its legacy will be felt for generations.

We must act now by adopting best practices and leveraging technology, because prevention is not just possible, it's essential.

The mining industry's environmental responsibility is emphasised by the Earth Day theme, which calls for major acceleration of clean energy worldwide, to triple the generation of clean electricity by 2030.

As we mark Earth Day 2025, let us remember: true sustainability is about more than compliance. It's about commitment - to people, to the planet, and to a future where mining can coexist with environmental resilience.

As we reflect on Earth Day, I encourage the mining industry to take a more proactive approach to managing the environmental risks associated with this crucial part of mining operations. Prevention must become the priority.

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