



Mine Tailings and Residue Management

GUIDING PRINCIPLES

Purpose

Disposal of process residues and mine tailings in an environmentally and socially appropriate manner is critical to a member company's social license to operate and the long term business sustainability of zinc operations. A systematic approach to effective tailings management is recommended, which includes the implementation of risk-based management strategies that account for the viewpoints and expectations of the communities in which companies operate.

Guiding Principles

IZA members are encouraged to implement and operate a safe and environmentally responsible management system for tailings disposal, including containment systems. The nature requirements of tailings and residue facilities can be site-specific – making rigid application of generic systems and methods for their management difficult. However, an appropriate management system should consider the following guiding principles:

- *Apply throughout the life cycle* of the structure, from design and engineering through construction, operations and closure through to decommissioning and reclamation,
- Address both the *geotechnical stability of the structure and environmental aspects*, including the chemical stability of the deposit,
- Meet or exceed the *technical and environmental design requirements* of applicable technical, regulatory or other standards,
- Include *periodic monitoring*, field inspections and independent reviews by qualified professionals at appropriate intervals,
- Include an appropriate *assessment of site-specific risks and potential impacts* and appropriate policies, plans and procedures to prevent, detect and respond to specific threats and to prevent or mitigate potential impacts on human health, the environment or property, and
- *Maintain an operating manual* that specifies procedures for the operation, monitoring and surveillance of the structure.





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Benefits

The benefits of applying leading practice in tailings management are as follows:

- *Compliance* with regulatory requirements;
- *Attract and retain a “social license to operate”* – an unwritten social contract with local communities;
- Seen as *developer and partner of choice* due to sustainable business practices;
- *Reduced costs* of impact mitigation and rehabilitation through proper planning and management; and
- *Reduced insurance and bonding requirements* due to effective risk management and decreased likelihood of contingent liabilities.¹



Member Success Stories

Xstrata: Adopting new technologies to reduce high iron content tailings

A major waste management issue for the zinc industry is the generation of high iron content waste. In Xstrata Zinc's operations, iron is removed as iron sulphate (jarosite) and classified as a hazardous waste. At San Juan de Nieva in Spain, jarosite is transformed into jarofix, a solidified, stabilised, inert material, which is being used to rehabilitate a nearby quarry. Xstrata Zinc was the first European zinc producer to adopt this new technology, allowing it to achieve two main objectives: resolution of the waste problem and land rehabilitation.

Anglo American: Expanding existing tailings guideline document

Anglo American has set new targets at the corporate level and within business units, including the expansion of its existing tailings guideline document to include other mine waste such as waste rock, heap leach pads, backfilling and slag disposal. The baseline performance will be set in 2006 and initial reduction targets set for 2007. Anglo American also conducts an annual group tailings risk assessment study and publishes a report.

Helpful Resources

- Proposed Directive 2006/21/EC of the European Parliament and of the Council on the management of waste from the extractive industries <http://ec.europa.eu/environment/waste/mining/index.htm>
- Leading Practice Tailings Management Handbook (currently consultation draft). Government of Australia, 2006. www.industry.gov.au
- Good Practice Mining Website - International Council on Mining and Metals (ICMM) and the International Commission on Large Dams (ICOLD), provides access to a library of good practice references on tailings. <http://www.goodpracticemining.com/tailings/>
- Developing an Operation, Maintenance and Surveillance Manual for Tailings and Waste Management Facilities. The Mining Association of Canada, 2003. www.mining.ca/www/media_lib/MAC_Documents/omsguideeng.pdf

¹ Leading Practices Tailings Management Handbook. Draft published by Australian Government, Oct 2006.