

E8 - Mineral waste management

Scope

This standard is applicable to all Rio Tinto business units and managed operations, including – where applicable - admin/corporate offices and research facilities located off site, and covers the management of mining and process waste generated by their activities, or which are taken by the operations to dispose or manage on behalf of others.

Definition: Mineral waste includes: waste rock and overburden, tailings and spent heap leach ore from mineral processing, rock masses disturbed by block caving, rejects from beneficiation or concentration of coal and other minerals, bauxite residue from alumina production, dross, refinery discards and sludges, smelter and other furnace slags, ashes, water treatment sludges, dredging materials and soils contaminated by mineral waste.

Intent: The intent of this standard is to ensure environmentally sound and effective management of mining and process wastes generated or handled by Rio Tinto operations. Waste disposal facilities and sites must be physically, biologically and chemically safe. Waste production and disturbed footprint shall be minimised and waste re-use, in-pit backfill, progressive rehabilitation and recycling maximised.

Other relevant documents:

- HSEQ management system (or standard E1 EMS for non ABS operations)
- Air quality control standard
- Non-Mineral waste management standard
- Hazardous materials and contamination control standard
- Closure standard
- Acid rock drainage prediction and control standard
- Land use stewardship standard
- Water use and quality control standard
- Mineral waste management guidance note
- Rio Tinto guideline for six-monthly social and environmental reporting

Programme design

1 Planning

- 1.1 Identify, assess and document the quantities, physical and chemical characteristics and hazards of the wastes that will be generated by mining and processing of each distinct section of the mineral deposit.
- 1.2 Develop and maintain an inventory of mineral wastes generated, handled and disposed of, whether on or offsite,

- including descriptions of hazard and other characteristics, quantity disposed of per year, total stored on site and details of location and techniques used for handling and disposal.
- 1.3 Maintain a procedure, including evaluation criteria, for identification of hazards, potential modes of failure and assessment of risks posed by tailings dams and other large waste disposal facilities.
 - 1.4 Maintain, for each waste disposal facility or site, an up to date conceptual and/or numeric model of the long-term physical and chemical waste behaviour and impacts on the environment. The model must be validated using data from prediction tests and monitoring.
 - 1.5 Ensure that design and construction of all waste disposal facilities or sites are:
 - a) compatible with the waste behaviour, addressing any threats to the environment, particularly those posed by contaminated run-off and seepage, wind and water erosion, direct exposure to chemical hazards, asbestiform minerals, and geotechnical instability;
 - b) engineered to best available or applicable technology for stability and safety; and

- c) located within permit boundaries in a manner that minimises impacts to sensitive receiving environments and water resources.
- 1.6 New developments will not use tailings disposal facilities for water storage functions. Any existing dual storage of wastes and water must undergo a risk assessment and a study of potential alternatives.
- 1.7 Apply a change management procedure for the approval of any significant modification to waste disposal facilities, waste generation processes or waste handling and disposal procedures.
- 1.8 Avoid any uncontrolled riverine disposal of mineral wastes.
- 1.9 Develop targets to drive improvements in aspects of mineral waste management. Progress towards the targets must be supported by a suitable set of actions.
- 1.10 Establish and maintain a documented Mineral waste management plan that covers all stages of waste management from generation to final use and/or disposal and that includes at a minimum:
- a) a summary assessment of the chemical and physical hazards posed by the waste and disposal facilities;

- b) the management plan designed to mitigate the chemical and physical hazards;
- c) assignment of clear accountabilities and responsibilities for mineral waste management and for implementing the management plan on an ongoing basis under actual field conditions;
- d) ongoing monitoring and data collection requirements; and
- e) emergency plans and contingency measures for response to unplanned conditions or unexpected impacts.

2 Implementation and operation

2.1 Maintain operational procedures commensurate with the identified hazards of each waste disposal facility for managing:

- a) the waste mass and its physical and chemical reactions;
- b) the containment structure and its stability issues;
- c) waste placement, segregation and handling requirements; and
- d) spills and improperly placed materials.

- 2.2 Ensure that the supervision and operation of disposal and storage facilities are commensurate with the environmental and safety hazards posed by the waste and the facility. Persons that manage or handle hazardous waste must be appropriately trained.
- 2.3 Undertake assessments of contractors and facilities used for wastes sent off-site for disposal or treatment, to verify that the wastes have been dealt with appropriately.

3 Performance measurement

- 3.1 Monitor physical stability parameters of waste disposal structures as an early detection and warning mechanism for potential failure.
- 3.2 Conduct regular monitoring of the geochemical behaviour of the waste repositories for validation or review of the waste behaviour model and early warning of potential pollution problems.
- 3.3 Conduct independent and external review by qualified engineering specialist(s) of all major waste storage facilities according to protocols and frequencies adequate to their physical and chemical hazards and level of risks. Frequency of external reviews must not be less than once every two years for physical hazards and once every four years for chemical

hazards. Any significant findings must be reported according to Rio Tinto requirements.

- 3.4 Maintain an emergency system, including communication with stakeholders, for responding to potential incidents involving waste storage facilities and transport to disposal facilities.

4 Revision history

Version no.	Effective date	Prepared by	Authorised by	
1	June 2005	Adelino Taboada	ExCo	
Version no.	Revision date	Revised by	Authorised by	Reason for change
2	December 2008	Adrian van Tonder	Bruce Kelley	Incorporation of suggested changes from operations and alignment with HSEQ management system.