

Standard

**D5 – Management of tailings and water storage
August 2015**

Group Standard	Title: Management of tailings and water storage facilities		Document no: HSEC-B-23	
	Function: Health, Safety, Environment and Communities (HSEC)			
	No. of pages: 5			
	Approved by ExCo: August 2015	Effective: August 2015	Supersedes: Nil	No. audit before: August 2016
Owner: Global head of Health, Safety, Environment and Communities		Approver: Executive Committee		Target audience: All Rio Tinto staff and each Rio Tinto Group business and function
Direct linkages to other relevant Policies, standard, procedures or guidance notes: Safety performance standards, Environment performance standards, Closure Standard				
Document purpose: To support implementation of the Group Safety policy. This standard covers the management of risks associated with the operation of tailings storage facilities and water storage facilities				

D5 – Management of tailings and water storage facilities

Scope and intent

The Safety standard *D5 - Management of tailings and water storage facilities* (the standard) applies to all Rio Tinto projects, business units and managed operations, including new acquisitions. It covers all development phases from planning, design through construction, operation, closure and, post-closure where applicable.

The standard, along with the *Management of tailings and water storage facilities Group procedure* covers the requirements for management of risks associated with tailings and water storage facilities.

Operating tailings facilities, major closed and legacy tailings facilities and major water storage facilities, as defined in the Group procedure, must be in compliance with all clauses of the standard. Other facilities that are not major are required to be in compliance with select clauses as described in the Group procedure. Projects that plan, design and build tailings and/or water facilities must comply with all planning and implementation clauses.

Tailings comprise residues from all mineral beneficiation, refining or smelting processes, power station ash and residues from water treatment.

Tailings storage facilities (TSFs) include surface storages, dry stacks, in-pit, below ground and co-disposal facilities, whether on land or in water.

Water storage facilities (WSFs) are facilities for the storage of water only and include above and below ground, lined and unlined facilities.

The standard does not apply to water or tailings tankage.

The business unit or managed operation must also comply with prevailing mining and environmental law and government legislation in the country or state in which it operates, and comply with relevant mining title and other regulatory approval licence conditions.

Clarification and definition of terminology used in the standard are presented in the *Management of tailings and water storage facilities Group procedure*.

Control requirements

Requirements in this standard apply in addition to any defined in the Rio Tinto management system standard. At all times, the minimisation of risk is the priority.

Planning

- 1.1 Each project, operation, site with a tailings and/or a water storage facility must have a Nominated manager who is accountable for the implementation of the standard and the Group procedure.
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- 1.2 The Nominated manager must arrange for development and maintenance of the following documents to meet the requirements defined in the associated Group procedure:
- a) *Tailings management plan* (TMP); and/or *Water storage plan* (WSP) where required;
 - b) TSF/WSF facility design report(s) and detailed TSF stage design reports;
 - c) Construction and Quality Control / Quality Assurance (QA/QC) reports; and
 - d) Operations, monitoring and maintenance (OMM) manual.
- 1.3 A qualified site representative must be appointed by the Nominated Manager to be responsible for the planning, management of the design and construction, operation and monitoring of the tailings and water storage facilities.
- 1.4 New developments must not rely upon TSFs for excess water storage functions beyond that required for clarification, storm surge and recycling of process water. Any existing dual storage of tailings and water must undergo a risk assessment and a study of potential alternatives.
- 1.5 The TMP/WSP must identify the risks to be addressed in the design and the resources, schedule and capital allowances required for the management of tailings/water for the life of mine through to closure.
- 1.6 The TMP/WSP must be reviewed annually and the plan(s) must be updated if and when significant changes in input/plan are anticipated or encountered.
- 1.7 TSF/WSF Facility designs must be prepared that establish the final arrangement and technical feasibility for each facility.
- 1.8 TSF/WSF Facility designs must be prepared by suitably qualified and experienced Design Engineers and presented in design reports.
- 1.9 The layout, design, and operation of each TSF/WSF must be based on a formal risk assessment and the findings of the risk assessment must be included in the site risk register.
- 1.10 The Facility design for each facility must be based on the TMP/WSP and industry standard geological, geotechnical, hydrological, groundwater, climatic, seismic and tailings characterisation studies.
- 1.11 The requirements in the Environment standard *E14 – Land disturbance and rehabilitation control* and the *Closure standard* must be implemented to ensure that closure is incorporated in the design. The requirements in the Environment standard *E11 - Water quality protection and water management standard* must be implemented by the development of a water management model/plan which is updated on a regular basis and includes key risk factors.

- 1.12 The Facility design must adopt industry-accepted design criteria and design bases that are developed using best practice design principles and meet all local regulatory requirements.
- 1.13 The Facility design report must document that the TSF/WSF is designed to manage risk during construction, operation, closure and post-closure.
- 1.14 The Facility design report must contain the requirements for operating, monitoring and maintaining the facility including specific quantitative performance objectives which are included in the OMM manual to ensure that it is operated in a manner that meets the design intent.
- 1.15 The OMM manual must be prepared and be fully implemented in the operation of the facility
- 1.16 The Facility design must be reviewed by an independent specialist or an independent technical review team, depending on the level of risk.
- 1.17 The site emergency response plan (ERP) must include a section specific to the TSF/WSF and specify the roles, responsibilities, contacts and actions to be taken in the event of or imminent uncontrolled release from the TSF/WSF.
- 1.18 Changes to the TMP/WSP, the TSF/WSF Facility design, detailed designs, construction or operation of the facilities or the ERP and change of consultant/design engineer require formal management of change processes that must document the risks and impacts of the proposed change, including opportunities to avoid or reduce impacts prior to implementation.

Implementation and operation

- 1.19 Each stage in the development of a TSF/WSF must have a detailed design, construction drawings and technical specifications prepared by the Design engineer.
- 1.20 The detailed design must define the required construction performance acceptance criteria to ensure that the design objectives are practically achieved during construction.
- 1.21 The detailed design of each stage must be reviewed by an independent specialist or an independent technical review team depending on the level of risk.
- 1.22 Construction of each stage of the TSF/WSF must be supervised by a qualified engineer.
- 1.23 Construction of each stage of TSF/WSF must be reviewed and certified as conforming to the intent of the approved design by the Design Engineer or its representative.
- 1.24 Construction of each stage of TSF/WSF must be subject to appropriate Quality Control (QC) done by either the builder or an independent consultant and to Quality Assurance (QA) undertaken by the Nominated manager or delegated representative.

- 1.25 A construction report is required for each stage of the TSF/WSF that provides full detail of the construction, including the QA/QC results, variations from the design and as-built drawings.
- 1.26 Personnel who carry out the day to day operations of the TSF/WSF must be trained and competent in the operation of the facilities and the recognition and identification of potential hazards associated with the facility.

Monitoring

- 1.27 Monitoring and design verification must be carried out at the frequency prescribed in the OMM manual and the data must periodically, but not more than annually, be reviewed by the Design engineer to ensure that the facility is operating within the design constraints.
- 1.28 All significant incidents and non-conformances in the operation of the facilities must be investigated, addressed and recorded.
- 1.29 Independent reviews of the operations must be conducted by qualified specialist(s) of all major TSF/WSFs. Frequency of independent reviews must not be less than once every two years. The reviewer(s) must complete and sign the inspection certificate i.e. certificate of compliance.

Revision history

Version No.	Effective Date	Prepared by	Reviewed by	Authorised by	
1	August 2015	Bruce Brown	BU & T&I geotechnical practitioners	Kevin McLeish	

April 27, 2017

Mr. Neil Bosworth
Forest Supervisor – Tonto National Forest
2324 East McDowell Road
Phoenix, AZ 85006

Subject: Resolution Copper Mining, LLC – Mine Plan of Operations and Land Exchange – Action Items Identified and Tailings Alternatives Information

Dear Mr. Bosworth,

As a follow-up to our letter dated March 9, 2017 and in response to action item EIS-55 from routine project meetings please see attached the following information:

Attachment 1: Tailings design basis memorandum (DBM). This document outlines the tailings design criteria based on regulations and international best practice. This document can be updated throughout the NEPA analysis.

Attachment 2: Rio Tinto D5 Standard – Management of Tailings and Water Storage Facilities. This document has been provided in response to action item EIS-55.

Additional information related to critical flaws, MAA and filtered tailings is forthcoming.

Sincerely,



Vicky Peacey
Senior Manager - Permitting and Approvals, Resolution Copper Company, as Manager of Resolution Copper Mining, LLC

cc: Mary Rasmussen, Project Team Leader, Resolution Copper Mining Proposal & Land Exchange Project, Tonto National Forest
Mary Morissette, Senior Permitting Specialist, Resolution Copper Company