



TAILINGS STORAGE FACILITIES

Western areas Ltd (WSA) has two tailings storage facilities (TSFs), one active TSF at the Forrestania Nickel Operation and an inactive TSF at the Cosmos Nickel Project, which is currently under care and maintenance.

Cosmic Boy Tailings Storage Facility

The Cosmic Boy TSF, originally constructed as an irregular shape paddock type facility, was operated by Outokumpu between 1992 and 1999, where after it was rehabilitated. Approximately ten years later, in 2009, WSA constructed a circular TSF with a footprint area of 35ha on top of the original TSF, which is currently still operational.

The TSF contains tailings from the nickel sulphide flotation process. Decant water is returned to the processing plant by means of a pump that is installed at the centrally located decant structure.

In addition to the Department of Water and Environmental Regulation (DWER) licence requirements, eight vibrating wire piezometers (VWPs) have been installed. Four of these were installed within the perimeter embankment and four were placed on top of the tailings beach following Stage 2 embankment raise construction. These instruments provide an assessment of the phreatic surface within the TSF embankment. Seepage from underneath the facility is returned to the TSF via recovery bores.

The TSF is classified as Category 1, low hazard facility according to Department of Mines, Industry Regulation and Safety (DMIRS) (formerly DMP). The classification is based on a future height in excess of 15m and low potential for risk to the environment, human safety and economic loss.

Since the commencement of the Spotted Quoll Underground in 2012, reclaimed tailings from the original Outopkumou TSF area have been used to generate approximately 290k tonnes of pastefill per annum. A buffer zone is in place to protect the active area of the TSF. This enables the Company to utilise the existing TSF footprint without the requirement to increase the TSF ground area. Pastefill dries and hardens in a similar manner to concrete and provides support to the mined-out voids to prevent instability within the mining operations.

Cosmos Tailings Storage Facility

The TSF at the Cosmos Nickel Project (Cosmos), located approximately 40km north of Leinster in the Eastern Goldfields of Western Australia (WA), is an above-ground, paddock-type storage facility, originally constructed as two cells. The first cell was commissioned in April 2000, and the second was constructed in 2003. Deposition was alternated between the cells during operation. The two cells were subsequently combined to form one larger cell, the current TSF.

WSA purchased the Cosmos Nickel Project from Xstrata in October 2015. The TSF has been in care and maintenance since late 2012. The TSF is also classified as a Category 1, low hazard facility according to DMIRS.

The Cosmos Odysseus Definitive Feasibility Study includes the use of approximately 300 tonnes per annum of wet tailings for pastefill.

Management of Active Tailing Storage Facilities

The TSFs are managed in line with the Western Australian legislative framework, being the DMIRS “Code of practice: tailings storage facilities in Western Australia” (2013) and DMIRS “Guide to departmental requirements for the management and closure of tailings storage facilities” (2015).

WSA has a tailings management plan manual and TSF operations manual which, when followed, will ensure compliance with the licence conditions. The manual requires regular inspections of the tailings delivery pipeline, location of discharge points, remaining freeboard, size of the decant pond and seepage along the toe of the perimeter embankment.



The correct management of the TSF is verified annually by an independent qualified geotechnical specialist. This is done by means of visual inspections of the TSF and examination of supporting documentation. As part of this review, stability analysis of the embankments is conducted. The most recent audit was conducted in June 2019.

The company's risk management program incorporates control monitoring reviews which determine the appropriateness and effectiveness of the internal control environment applied to material risks, including the TSF. Residual risks associated with the TSF were considered by the risk management program and found to be not material.

A TSF failure has been identified as a significant impact to operations, and as such a Business Continuity Plan has been developed to manage this risk. In summary, the business continuity plan calls for immediate ceasing of deposition, consultation with regulators and geotechnical specialists, development and execution of a plan to return the TSF to operating condition.

Given the elevation of the TSF is lower than all assets on site and its location is well away from dwellings, it is considered to have no potential impact to the local community. The risk of harm is therefore limited to anyone working on the TSF itself during a failure.

A TSF failure could result in exposure of tailings to local vegetation and fauna over a moderate area only. As the TSF is located in a low-lying area relative to the local terrain, the flow extent of tailings would be limited.

To date there have been no failures of the TSF embankment.

In light of the recent TSF embankment failures, WSA's policies have been reviewed and deemed robust enough that there are no major changes planned to the company's current tailings management strategies. However, WSA will continue to work with both internal and external parties to continuously monitor and evolve our management tools as industry best practice dictates.



Key Statistics

	Cosmic Boy TSF	Cosmos TSF
Tailings Facility Name/Identifier	Cosmic Boy Tailings Storage Facility TSF1	Cosmos TSF
Location	-32.58, 119.75	-27.58, 120.58
Ownership	Owned and operated by Western Areas LTD	Operated by Australian Nickel Investments (A wholly owned subsidiary of Western Areas LTD)
Status	Active	Care and Maintenance
Date of initial operation	2009	2000
Is the dam currently operated or closed as per currently approved design	Dam is currently operational	Dam is currently in care and maintenance
Raising Method	Upstream	Upstream
Current maximum height	17m	12.3m
Current tailing storage impoundment volume (m3)	2,800,000 m3	1,370,000 m3
Planned tailing storage impoundment volume (m3)	3,300,000 m3	1,940,000 m3
Most recent independent expert review	June 2019	December 2018
Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure	Yes	Comprehensive but not full and complete.
What is your hazard categorisation of this facility, based on the consequence of failure	Significant	Significant
What guideline do you follow for the classification system	DMIRS recommended codes of practice Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure (Ancold May 2012)	DMIRS recommended codes of practice Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure (Ancold May 2012)
Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	No	No
Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	External	External
Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	Yes, 2013	No
Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	Yes and Yes	Yes and Yes
Have you, or do you plan to assess your tailings facilities against the impact of more regular weather events as a result of climate change, e.g. over the next two years?	Yes	Yes
Any other relevant information and supporting documentation.		