Factsheet

Tailings Storage Facility

A Tailings Storage Facility (TSF)is a dam/containment structure that is used to store tailings. Tailings are typically transported to, and discharged into the TSF as a slurry.

WHAT ARE TAILINGS?

Tailings are finely ground residual materials from mining, processing, and extractive operations, and thus are the non-economic materials remaining after separation from saleable minerals.

The Stockman tailings contain the mineral pyrite, which can oxidise when exposed to the air, potentially producing acidic material, resulting in poor water quality. The key to the management of this potential issue for the project will be to ensure tailings are deposited underwater, the same practice used during previous operations.

TSF GUIDELINES AND STANDARDS

The TSF has been designed to meet the following guidelines and standards:

- Design and Management of Tailings Storage Facilities - 2017 Technical Guideline from Victorian Economic Development Jobs, Transport and Resources
- Australian National Committee on Large Dams (ANCOLD) - 2012 Guidelines on Tailings Dams
- International Commission On Large Dams (ICOLD) - various guidelines on dam design, construction, operation and monitoring and surveillance.

STOCKMAN TSF HISTORY

- The TSF to be used for future storage of tailings is at the location of a currently closed and rehabilitated dam that is now a lake that has inflows and outflows.
- It was originally constructed in 1992, to store tailings from the previous mining of the Wilga ore deposit.
- The initial TSF structure was a 400m long valley fill embankment (wall), which was originally constructed via a series of staged downstream lifts.
- The TSF has a total catchment area of 122ha near the headwaters of Swifts Creek. Of this catchment area, approximately 96ha was diverted around the TSF during previous operations.
- Approximately 690 000 tonnes of tailings were deposited between 1992 and 1996.
- In 2006 the TSF was closed and rehabilitated.

FUTURE STOCKMAN TSF FEATURES

- The existing TSF embankment will be raised in a series of lifts during the life of the Stockman Project.
- Diversion drains will be constructed around the TSF to divert natural surface flows into Straights Creek, which flows into the Tambo River.
- The design for the future Stage 1 embankment raise has been reviewed by an Independent Technical Review Panel and found to be compliant with the ANCOLD guidelines.
- The design utilises multiple engineering controls including a clay core in the embankment, Geomembrane lining, extension grout curtain, and tailings density to minimise the potential for seepage.
- For Stage 1 construction, the existing TSF embankment is proposed to be raised by 9.2m to a Relative Level (RL) of 1184.3m

TSF DESIGN SAFETY CONSIDERATIONS

Aeris has followed design standards to ensure that the TSF's design meets the ANCOLD guidelines. It has been designed to meet the requirements of an ANCOLD classification of a High C Consequence Category (which is a higher risk category than required by its Population at Risk threshold).

The TSF is designed for the Probable Maximum Flood (PMF) event, which is defined as the 1 in 10 000 000 annual exceedance probability 72-hour return event.

It is also designed to withstand seismic events based upon the Maximum Design Earthquake (MDE), which is measured as the 1 in 10 000 annual exceedance probability return event.

The key to the management of this potential issue for the project will be to ensure tailings are deposited underwater, the same practice used during previous operations.

PERFORMANCE MONITORING

TSF performance monitoring is an important part of any dam safety programme, in order to confirm that performance meets design expectations. The performance monitoring program for the TSF is set out in the Operation, Maintenance, and Surveillance Manual (OMS). The OMS manual will be developed in accordance with the ANCOLD guidelines, reviewed by the Independent Technical Review Panel (ITR) and implemented prior to construction. Monitoring and surveillance of TSF includes:

- **Piezometric Monitoring:** Piezometers measure pore pressure within the embankment, tailings and foundations, for stability modelling.
- **Drain Flow Monitoring:** Drains have been installed inside the embankment of each tailings lift to intercept any tailings seepage water.
- **Deformation Survey:** Survey markers are located surrounding the TSF to determine if there is any vertical or horizontal movement of the TSF embankment. Deformation monitoring results indicate that the TSF is in a safe and stable condition.

Regular dam safety inspections of the TSF will also be undertaken by a Registered Professional Engineer in accordance with the ANCOLD guidelines.

EMERGENCY RESPONSE PLAN

- Aeris will have a TSF Emergency Response Plan (ERP) that details the actions to be taken, and by whom, in any potential emergency associated with the facility.
- The purpose of the ERP is to minimise the potential of harm to people, public infrastructure and the environment.
- The ERP will be updated periodically or when a material change to the TSF occurs, such as when applying for an approval for an embankment lift.
- The ERP will be developed in accordance with the ANCOLD guideline, and subject to review by the Independent Technical Review Panel.

TSF CLOSURE

- Aeris will accept liability for the current TSF structure from the state government prior to construction.
- At closure, the TSF will be returned to a lake design with inflows and outflows.
- A saturated cover will be maintained over the tailings preventing poor water quality, including acidity. A strategy currently proving effective.
- Post-closure monitoring of the TSF will include annual inspections of the TSF and reviews of groundwater and surface water monitoring.
- A comprehensive audit will b e conducted every five years in accordance with ANCOLD guidelines; and safety reviews every 20 years. The cost of the post closure monitoring will be covered by the funds that are to be paid into the Post Closure Fund that will be managed by the State Government for overseeing the ongoing monitoring and management.