

McPhillamys Gold Project

#9 Tailings storage facility

Tailings and tailings storage

Tailings are by-products from the processing of ore. Tailings are discharged – normally as slurry – to a tailings storage facility.

A tailings storage facility is a purpose-built structure which stores the tailings from the processing plant.

The proposed tailings storage facility for McPhillamys will be located in the north of the site and will have a surface area of approximately 260 hectares.

Why this site was chosen

This site was chosen as the most suitable site for the tailings storage facility for a number of reasons, the main one being that the geology has low to very low groundwater permeability. That means there is very little space in the ground for fluid to flow, reducing the risk of fluids leaving the site and entering the downstream Belubula catchment (see Figure 2 on p2).

Of all the options considered, the chosen site also has the least impact on native vegetation, meaning less disturbance for trees, plants and animals.

The location is also mostly in a valley, so the facility will be shielded from most surrounding viewpoints.

Designed for stability and safety

The design and construction of the McPhillamys tailings storage facility is a very important part of the project. The facility has been designed to meet the highest standards required by the NSW Dams Safety Act.

It will be constructed using the downstream method (see Figure 1, below), the most robust construction method for tailings storage facilities.

The facility will have enough storage capacity to enable it to fill and rise gradually over the life of the project. Importantly, it will have enough capacity to withstand extreme rain events.

Stability modelling also shows that there would be no uncontrolled release of tailings from the storage facility—consistent with NSW Dams Safety standards— even in the event of a 1 in 10,000 year earthquake.

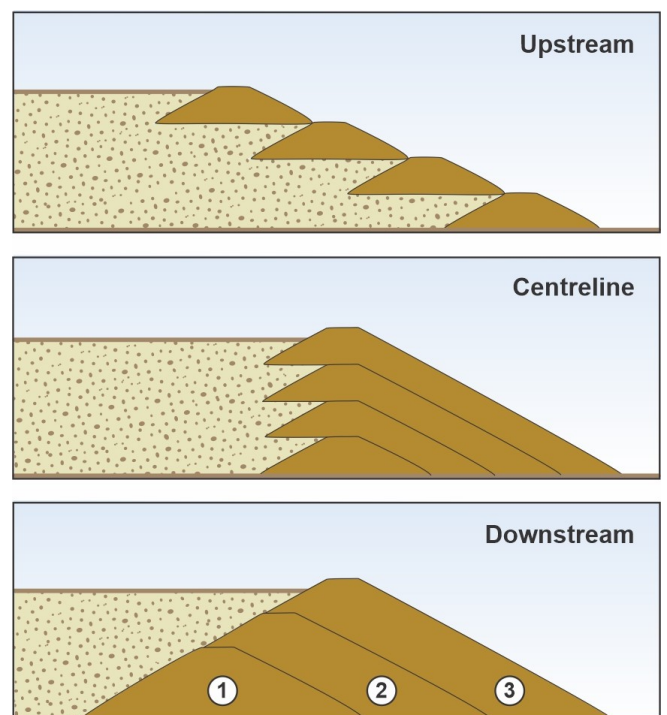
Recycling water

The tailings storage facility also plays an important role in the project’s system of recycling water.

The design includes a water recovery structure which will reclaim water from the dam and return it for reuse in the processing plant.

Figure 1: Construction methods for tailings storage facilities include upstream, downstream and centreline. McPhillamys proposes to use a version of the downstream method.

The McPhillamys tailings storage facility will use the downstream method — and will be constructed in three stages.



Construction

The tailings storage facility will be constructed gradually, to accommodate the tailings produced as mining progresses.

There are three main stages:

Stage One – Constructed prior to the start of processing operations, with capacity to store the first two years of tailings production.

Stage Two – Constructed prior to the filling of Stage One, Stage Two will accommodate around three years of tailings production.

Stage Three – Constructed prior to the filling of Stage two, Stage Three will accommodate the remaining tailings production.

Monitoring and inspections

The facility will be inspected regularly as part of an ongoing safety program. Inspections will also take place after significant rainfall events. They will check for things like the physical condition of the embankment and all of the infrastructure feeding into and out of the facility.

The tailings storage facility will also be constantly monitored as part of the processing operations. Monitoring will include the tailings going into the facility, the water being pumped out; any possible seepage; wall stability; and groundwater and downstream surface water.

Seepage management

There are a number of safeguards for potential seepage management from the tailings storage facility.

These include the following:

- Removal of weak or oversaturated soils from the foundations of the embankment of the facility.
- Lining and conditioning the floor so that fluids won't seep into the ground below (consistent with NSW Environment Protection Authority requirements).
- Constructing the embankment with a low-permeability, clay-lined zone.
- Placing a drain at the bottom of the main embankment to direct and capture any potential seepage so it can be recirculated back to the processing plant, for reuse.
- Installing groundwater monitoring bores around the tailings storage facility to provide early warning of any unintended seepage.
- Installing seepage interception bores downstream to intercept any unintended seepage (should it occur).

Figure 2:
Seepage management for the McPhillamys tailings storage facility.

