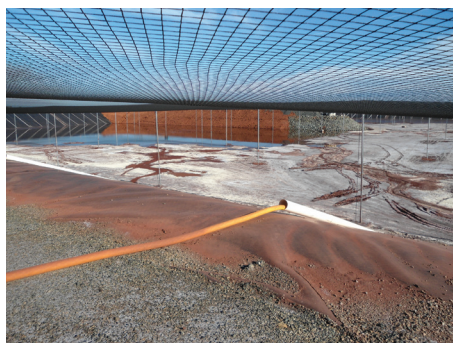


# INFORMATION SHEET



## WATER AND TAILINGS

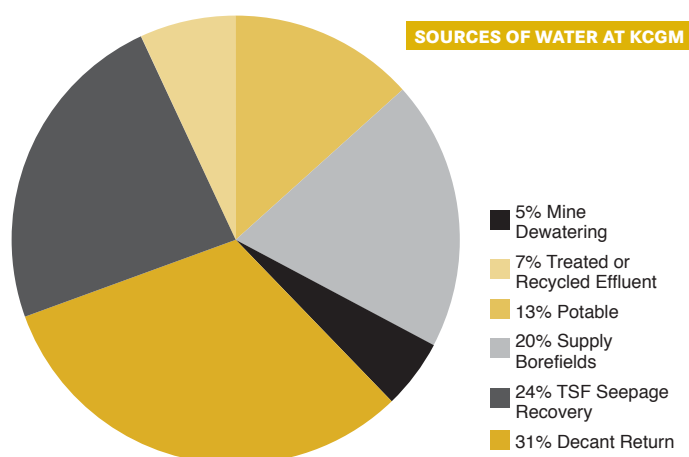
**Good water and tailings management is essential at KCGM as both are critical components in the processing of ore into gold.**

Water is required for many activities including dust control, mineral processing, transporting tailings and for site amenities. The majority of water used at KCGM is saline groundwater and recycled water however some potable water is also required for operations.

### WHERE DOES KCGM OBTAIN WATER FOR ITS OPERATIONS?

KCGM uses around 12.5 gigalitres of water each year. Approximately 13% is potable water from the Kalgoorlie water supply system, 7% is recycled or treated effluent and 80% is saline from groundwater or water recovered and recycled from operations.

Groundwater in the Goldfields is saline, ranging from sea water quality to hypersaline (up to 5 times saltier than sea water). The quality of the groundwater means that it has no beneficial use other than for mining or mineral processing.



### HOW DOES KCGM MANAGE SALINE WATER?

The control of saline water to prevent seepage and spills is important to protect soil and vegetation. KCGM has around 150 kilometres of water and tailings pipelines. Pipelines are buried or laid within bunds with “catch” pits located at low points; they also have leak detection and are regularly inspected.

### HOW DOES KCGM USE WATER RESPONSIBLY?

KCGM is focused on the continual improvement of site-wide water supply and use. KCGM has a Water Efficiency Management Plan which is aligned with the Water Corporation’s Waterwise Business Program, aimed at minimising potable water use.

There is also a focus on the reduction of hypersaline groundwater extraction from remote borefields. This is achieved by prioritising water recovery from tailings decant and seepage recovery networks. Mathematical models can be used to help optimise the water use and choice of water supply sources.

### WHAT ARE TAILINGS?

“Tailings” is the term used to describe the waste product from the Fimiston and Gidji processing plants. It is typically a slurry mixture of finely ground solids, process water and residual reagents.

KCGM constructs and operates tailings storage facilities (TSFs), designed by specialist engineers to withstand floods, earthquakes and erosion. Tailings volumes deposited to the TSFs are directly related to the tonnages of ore or concentrate treated at the processing plants.

Regular reviews of the TSFs are undertaken by specialist engineers and are submitted to government agencies. These reviews cover aspects of groundwater monitoring, geotechnical stability and tailings management practices.



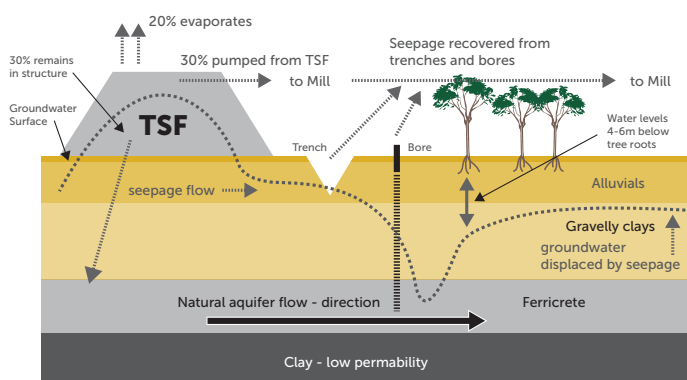
**AERIAL VIEW OF TSFs AT KCGM FIMISTON OPERATIONS**

## HOW DOES KCGM DEPOSIT TAILINGS?

Tailings are discharged from the processing plants as slurry, which is approximately 50% saline water. The slurry is pumped via pipelines, entering the TSF through spigots (pipe outlets) which are evenly spaced around the TSF perimeter. The tailings solids settle to form a gently sloping “beach” angled toward the centre of the TSF. The water in the slurry pools in the centre, creating what is known as a “decant pond” on the surface of the TSF. The pond is then pumped off by a decant pump and returned to the processing plant for reuse. Decant return water comprises 31% of KCGM’s total water usage.

### TSF Seepage Recovery

Not all water from tailings discharge is captured in the decant system. In unlined TSFs approximately 30% passes to ground and is termed seepage. At KCGM seepage is managed using a combination of groundwater production bores and seepage interception trenches with the collected water returned to the processing plant. In combination with the decant return water more than 50% of the water discharged to the TSF is recovered and reused.



TSF INTERACTION WITH SURROUNDING ENVIRONMENT AND WATER MOVEMENT

## WHAT EFFECT DOES SEEPAGE HAVE ON GROUNDWATER?

Seepage has caused localised groundwater mounds to develop surrounding the unlined TSFs. This seepage creates a pressure wave that can push natural groundwater around the TSF outwards and upwards. Much of the water “mound” is displaced groundwater and the mounding is detected by changes in groundwater quality and depth in surrounding monitoring bores.

KCGMs experience with other unlined TSFs is that the groundwater mound will reduce after closure of the TSF, and the water table will decline to near the background levels that existed before KCGM and previous mining companies operated in the area.

Changes in groundwater quality due to seepage will not impact on the beneficial use of the groundwater; however changes to groundwater depth require careful management. Protection of vegetation requires the groundwater depth to be maintained so as not to impact on the soils or roots from which plants source water.

Management of seepage at KCGM is governed by specific licence requirements, which include the development and implementation of Seepage and Groundwater Management Plans.

## HOW DOES KCGM MANAGE WATER AND TAILINGS TO PROTECT THE ENVIRONMENT?

### Daily Operations

KCGM undertakes inspections and checks of operational TSFs and related pipelines. These include daily checks by operators and supervisors, weekly inspections by supervisors and monthly system inspections by engineers. In addition, KCGM reports the results of its environmental and geotechnical monitoring to government agencies.

### Groundwater Monitoring

Groundwater monitoring is undertaken for each of the TSFs in accordance with a licence schedule. The monitoring includes both groundwater depth measurement and quality sampling and analysis. For groundwater quality sampling, both field analysis and a National Association of Testing Authorities (NATA) accredited laboratory analysis are conducted. Field analysis is for pH and electrical conductivity. Laboratory analysis is conducted to measure cyanide, pH, total dissolved solids (salinity), electrical conductivity and some metals.

### Vegetation Monitoring

Monitoring the health of vegetation around the TSFs is conducted to assess whether vegetation is affected by changing groundwater levels. Monitoring involves using photographs to assess tree health at specific locations.

### Fauna Protection

Formal recording of birds at the TSFs is incorporated into tailings inspections. Usage or presence of any other animals is reported internally and records are maintained. Each TSF is fully fenced to prevent fauna access and bird netting has been installed at Gidji.

## FURTHER INFORMATION

Information on KCGM’s management of water and tailings is available by contacting the KCGM Public Interaction Line on 9022 1100 (available 24hrs a day, seven days a week), or visiting the website [www.superpit.com.au](http://www.superpit.com.au).

