

# Water monitoring

FGM monitors surface water and groundwater to identify and assess potential impacts to surface or groundwater systems in the vicinity of FGM's mining operations and nearby groundwater users and associated aquatic ecosystems.

## Non-discharge site

FGM is a non-discharge site, meaning the site is not permitted to discharge any impacted surface water or groundwater beyond the premises boundary.

FGM maintains a comprehensive surface water management system, which captures all run-off from operational areas through a network of dams, drains and pits. These water bodies are routinely sampled as well as during significant rainfall events. Natural surface water flows from upstream of the mine site are diverted through dedicated diversion drains to ensure it remains unimpacted by the operation.



## How samples are collected

Water is collected by appropriately trained personnel and tested for a range of parameters in the field and laboratory. Some common testing that occurs includes pH and electrical conductivity. Samples are sent to a NATA accredited laboratory for testing of analytes – including metals, salts, and nutrients – and the results are entered into an environmental database.

## Water quality

Water quality is compared against the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC Guidelines). If exceedances are identified, the water quality data is assessed against historical trends, climatic conditions, and operational activities to determine potential contributing factors and further investigative actions.



## Where samples are collected

FGM undertakes routine water sampling at designated monitoring locations, including dams, pits, drains, groundwater bores, and at locations beyond the area of influence, such as the Campaspe River and Axe Creek.

Water sampling is typically undertaken on a monthly or quarterly basis, however some sites are sampled more frequently. Water samples are also taken during and after significant rainfall events, when the creeks and drains are actively flowing.



Groundwater monitoring



Annual Aquatic Survey of Campaspe River

## Water management

FGM collects, treats, or reuses all the water that is pumped from underground – and all water that is sent through the processing plant – using the following purpose-built water treatment facilities:

### Mine Water Treatment Plant

The Mine Water Treatment Plant (MWTP) treats mine water that has been pumped from underground. It is important to pump water from underground to keep our workers underground safe and dry. The mine water goes through a pre-treatment stage which involves:

- › ferric chloride precipitation to remove metals from the water, and
- › ionic filtration and exchange to remove sulphates and nitrates.

### Reverse Osmosis Plant

The Reverse Osmosis Plant further treats water by passing it through semi-permeable membrane cartridges under osmotic pressure to remove ions, molecules and larger particles from the solution.

### Diversion drains, culverts and silt traps

- › To ensure surface water run-off from large rainfall events are appropriately controlled, FGM regularly maintains diversion drains, culverts, and silt traps to minimise the mobilisation of sediment in surface flows.

### Activated Sludge Tailings Effluent Remediation Plant

The Activated Sludge Tailings Effluent Remediation (ASTER) Plant degrades residual cyanide species (including thiocyanate) contained in process water stored in a lined dam. The ASTER plant – like the BIOX technology used to extract gold at FGM – uses several bacterial species, which are kept warm and fed phosphate and molasses, to further degrade trace compounds allowing the water to be reused in the processing plant.

## Why water sampling is undertaken

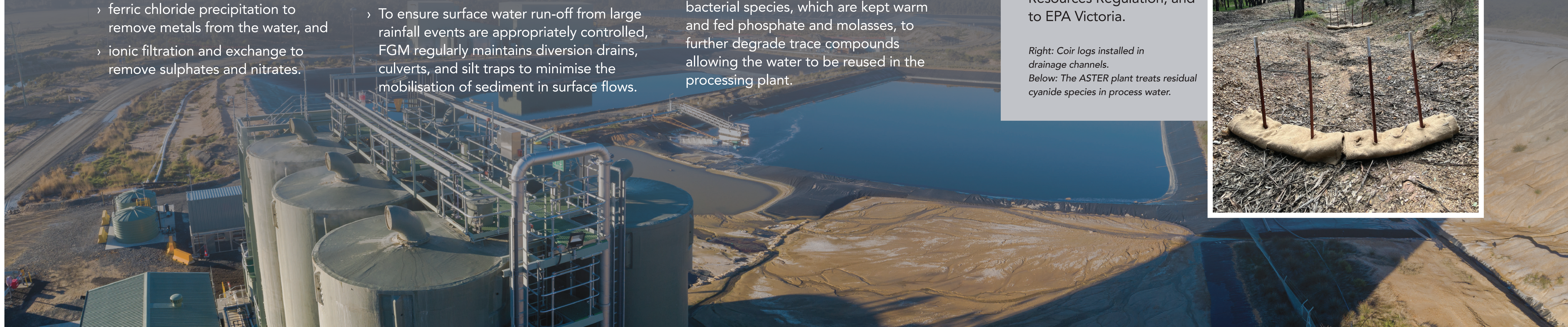
Regular water monitoring ensures any changes in water levels or water quality are recognised and investigated.

Any exceedances that are attributable to FGM's operations are thoroughly investigated and reported to the regulators (Earth Resources Regulation, EPA Victoria and Goulburn Murray Water).

Water monitoring results are routinely reported to the Environment Review Committee, to Earth Resources Regulation, and to EPA Victoria.



Right: Coir logs installed in drainage channels.  
Below: The ASTER plant treats residual cyanide species in process water.



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