



**A WaterWise Nation**  
Act Today. Sustain Tomorrow.

# MINING

## Water treatment and mining in South Africa



### Acid Mine Drainage (AMD)

Sulphide minerals oxidised generate acid; leach heavy metals  
water becomes highly acidic and toxic to ecosystems  
and human health.



### Water Scarcity

Mining in already water-stressed, low-rainfall or semi-arid  
regions. Huge water demand (process, cooling, dust  
suppression) places extra pressure on limited supply.



### Regulatory & Compliance Pressure

Strict rules on water discharges, pollution, health risks; need for environmental impact  
assessments; ongoing monitoring. Costs and risk of penalties are high.



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Solution	What It Does / Benefits
Passive AMD Treatment	For example, constructed wetlands, limestone drains. Use natural/low-maintenance systems to neutralise acid, filter out metals. Lower operation costs.
Active AMD Treatment	Chemical neutralisation (adding lime etc.), then settling/filtration of metals. Faster results but higher cost & requires sludge management.
Water Recycling & Reuse	Treating mine wastewater/tailings water and reusing it for internal operations (e.g. cooling, processing). Reduces freshwater demand and environmental discharge.
Advanced Filtration Technologies	Membrane filtration, reverse osmosis, ion exchange. These remove dissolved contaminants, heavy metals etc. Can purify to high standards.
Ecological Restoration	Re-vegetation, restoring natural drainage, improving soil. Helps with runoff control, water quality, habitat recovery.
Sustainable Mining Practices	Dry stacking of tailings (less water used / safer waste storage), using non-toxic alternatives for chemicals, reducing water-intensive processes. Improves environmental footprint + operational resilience.

## Why this matters

- Protects human health: contaminated water (heavy metals, acidity) risks like neurological, kidney, respiratory damage.
- Helps ecosystems recover or survive aquatic life vulnerable; ecosystems degrade under AMD and pollution.





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- Saves costs & reduces risk: water scarcity & non-compliance carry financial, reputational, regulatory risks.
- Supports sustainable mining & community relations: better water management improves trust, reduces conflict.

## Call to Action

- Mining companies: invest in both passive & active AMD solutions.
- Policymakers: ensure regulations are enforced and provide incentives for improved water reuse.
- Researchers & Innovators: push for more cost-efficient, low-energy filtration technologies; sustainable chemical alternatives.
- Communities: monitor water quality, demand transparency & accountability.

