

## **WATER QUALITY TEST PARAMETERS GUIDELINE**

When a mine conducts surface water quality monitoring, the parameters tested and the standards referenced should reflect potential pollutants from mining activities, as well as applicable South African water quality guidelines and regulatory obligations. The following parameters are typically included in surface water monitoring programmes for quarries and opencast mining operations and may serve as a guideline for the mine's monitoring approach.

### **Physico-chemical Parameters**

- Alkalinity
- Dissolved Oxygen (DO)
- Electrical Conductivity (EC)
- pH
- Temperature
- Total Dissolved Solids (TDS)
- Turbidity

### **Major Ions and Nutrients**

- Ammonia ( $\text{NH}_3$ )
- Antimony (Sb)
- Barium (Ba)
- Boron (Bo)
- Cadmium (Cd)
- Calcium ( $\text{Ca}^{2+}$ ),
- Chloride ( $\text{Cl}^-$ )
- Cobalt (Co)
- Fluoride (F)
- Magnesium ( $\text{Mg}^{2+}$ ),
- Nitrate ( $\text{NO}_3^-$ ) and Nitrite ( $\text{NO}_2^-$ )
- Phosphate ( $\text{PO}_4^{3-}$ )
- Potassium ( $\text{K}^+$ )
- Selenium (Se)
- Silicon (Si)
- Sodium ( $\text{Na}^+$ ),

- Sodium Absorption Ratio (SAR)
- Sulphate ( $\text{SO}_4^{2-}$ )
- Total Hardness

#### **Other Site-specific Parameters**

- Total Organic Carbon (TOC)
- Hydrocarbons (e.g. TPH – Total Petroleum Hydrocarbons if machinery, fuel storage or contaminated water nearby)
- Suspended Solids (TSS)
- Cyanide (if explosives are used that may leach)

#### **APPLICABLE STANDARDS AND GUIDELINES**

##### **1. DWS Water Quality Guidelines (1996)**

The South African Water Quality Guidelines (1996) provide the acceptable limits for various parameters depending on the intended use (e.g., irrigation, domestic, ecosystem support etc). The guidelines most likely to be applicable to an open-cast mining operation are:

- *South African Water Quality Guidelines Volume 1: Domestic Use,*
- *South African Water Quality Guidelines Volume 3: Industrial Use,*
- *South African Water Quality Guidelines Volume 4: Agricultural Use – Irrigation.*

##### **2. South African National Standard for Drinking Water Quality**

SANS 241:2015 sets limits for various parameters in drinking water to ensure it's safe consumption. These limits are categorised into physical, chemical, and aesthetic determinants with specific values for each.

##### **3. National Water Act, 1998 (Act No 36 of 1998)**

When applicable, monitoring must align with the conditions of the Water Use Licence (WUL) or General Authorisation applicable to the site, which usually prescribes specific limits and sampling frequency.

##### **4. GN 655 (2013) – National Water Resource Strategy Water Quality Objectives**

If applicable, local catchment water quality objectives must be considered.