

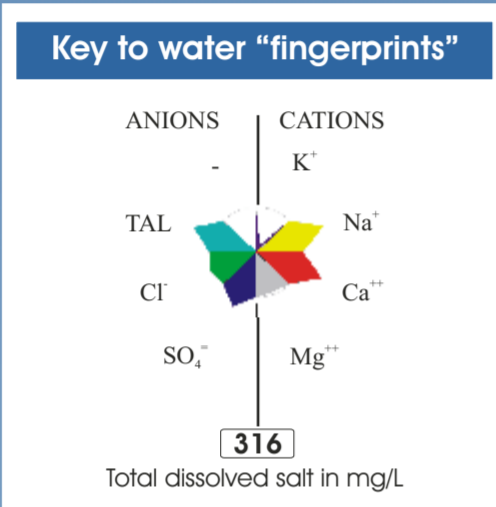


ORASECOM's Joint Basin Survey-1



UNDERSTANDING WATER QUALITY "FINGERPRINTS"

The chemical composition of water provides a wealth of information on the quality of the water, as well as the possible impacts of different pollution sources. This poster uses Maucha diagrams to "fingerprint" water quality, using water quality analyses undertaken as part of ORASECOM's Joint Basin Survey. Maucha diagrammes highlight the relative concentrations of the major cations and anions found in water. In this poster we have also included the total dissolved salt concentrations in milligrams per Litre (mg/L), underneath each Maucha diagram.



The background water quality "fingerprint"

The natural background water quality of the Orange-Senqu is dominated by Total Alkalinity (TAL) and Calcium (Ca⁺⁺) salts. Total dissolved salt concentrations in the upper reaches of the Senqu River are generally below 100 mg/L. Most of the upper reaches of the Vaal and Orange Rivers retain this characteristic, however, salt concentrations increase downstream.



The water quality "fingerprint" of irrigation areas

In irrigation areas, the water quality "fingerprint" is affected by irrigation return flows. This increases the proportion of Sodium (Na⁺) and Chloride (Cl⁻) salts in the water.



The water quality "fingerprint" of mining areas

The chemical composition of the water changes downstream of mining areas where acid mine drainage replaces the Total Alkalinity with Sulphate (SO₄⁻²) salts. In these areas the water quality "fingerprint" is typified by higher proportions of Sodium (Na⁺), Chloride (Cl⁻), and Sulphate salts.



"Fingerprinting" water quality

This poster shows how the Total Dissolved Salt concentrations and the proportions of the different salts in the water changes across the Orange-Senqu Basin in relation to pollution from mines, irrigation and urban areas.



SURVEY UNDERTAKEN WITH SUPPORT FROM:

