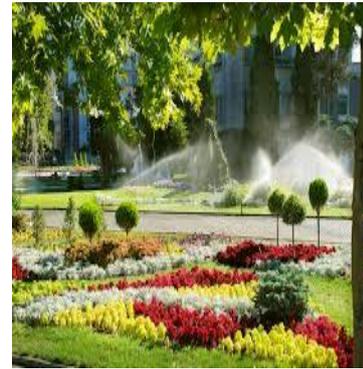
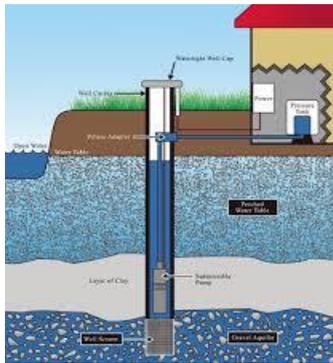


Borehole water

Groundwater is water that is underground that can, when found in large enough quantities, be tapped into by something like a well, or a borehole, in order to extract the water from the underground source in order to use it.

Borehole water is rich in naturally occurring minerals and hasn't been treated or altered with any man-made chemical additives. When you're drinking water from the municipal supply, the water has inevitably been treated and chlorinated in an effort to render the water “safe for human consumption”.



Changing environmental conditions across the world has resulted in changing weather patterns. It is this change that has resulted in the search for other water sources.

Therefore the introduction of other water sources needs to be analysed , aiming to understand how to manage its use and the impact it has on our lives.

a. Borehole Water Composition

pH : A measure of a liquid acid or basic nature

- The pH of borehole water can be either Acidic (pH less than 7) or Basic (pH > 7)

The borehole found in the South Africa has been found to have salinity and has a pH range of 5.5 to 6.7.

b. Inorganic and Macro pollutants

- To understand the groundwater composition in South Africa a number of different areas was selected , including Philippi , an area in Cape Town.

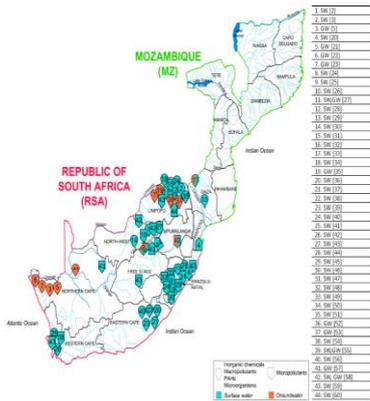


Figure 2. Map showing the places where the reviewed investigations took place, together with the type of water analyzed (surface water or groundwater), the group of monitored pollutants (macropollutants/inorganic chemicals/PAHs/microorganisms or micropollutants) and the corresponding references [2,3,5,20-60].

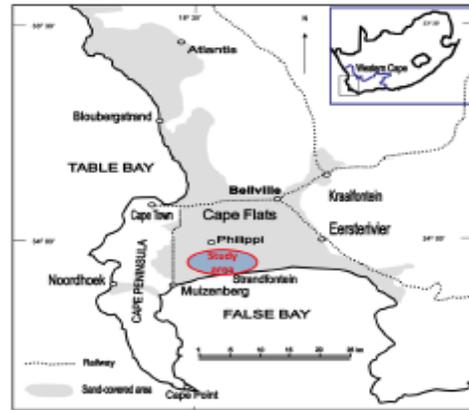


Figure 1 Location of the study area in Cape Flats region, South Africa

The Composition was best indicated by the use of Piper Diagrams , seen below :

Table 1 : Data extracted from the Philippi location

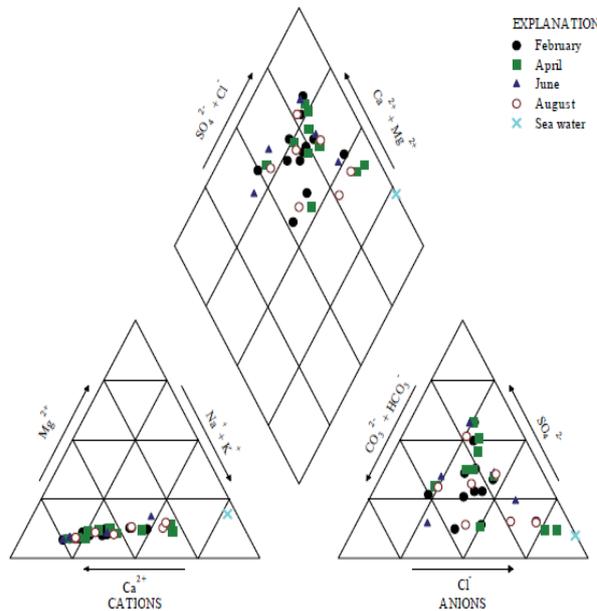


Figure 3 Plot of BH water samples and sea water on Piper diagram

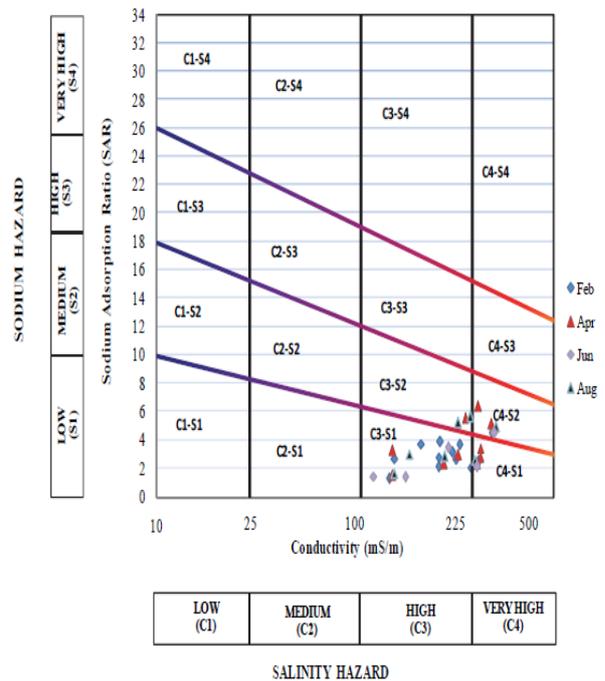


Table 2 : Data extracted across Western and Northern Side of South Africa

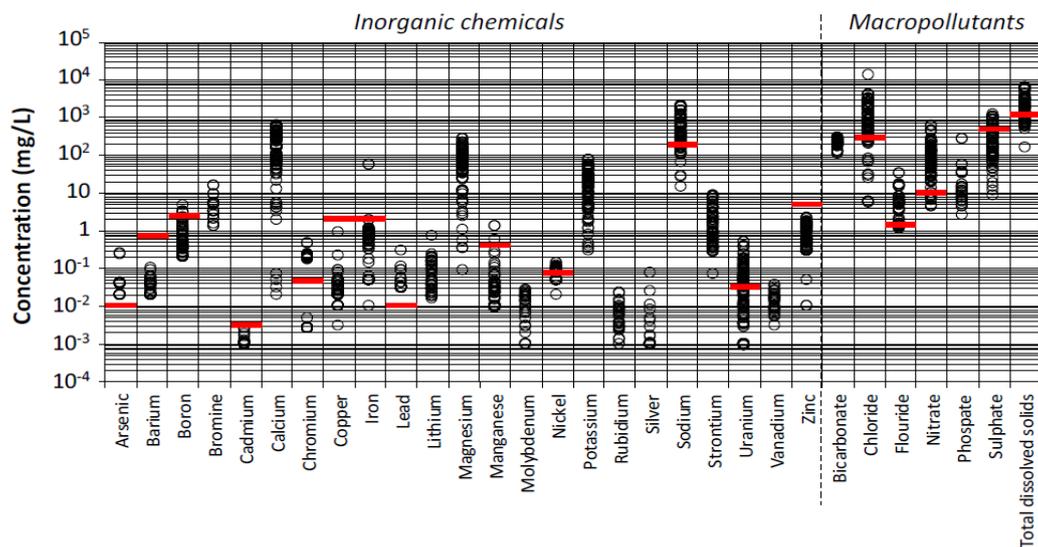


Figure 6. Observed concentrations (circles) inorganic chemical and macropollutants in groundwater in the reviewed studies referring to South Africa and the corresponding limits (red dashes) set by SANS-241 (red line) for drinking water. Data from: [5,21–23,35,52,53,57].

Based on the data sources above the following elements was present in high concentrations..

- Magnesium
- Chlorides
- Calcium
- Sulphates

c. Impact of the Inorganic and Macro Pollutants

The presence of these elements is the fact that they can combine to form compounds that when exposed to surface such as ZincAL , COLORPLUS ,Galvanised and Rhein zinc will dry out and shows spots on the product surfaces.

Long Term exposure, with no maintenance , could accelerate the rates of corrosion.

Compounds formed by the elements in borehole water and shows on the surface when the water evaporates

Calcium Chloride with pH 5.5 to 8.0



Calcium Carbonate with pH of 6.7



Calcium Sulphate with pH of 7.7



Sodium Chloride with pH of 7.0



The above photos shows that the residual compounds left on the surfaces after the water evaporates would be more whitish to light yellow in colour.

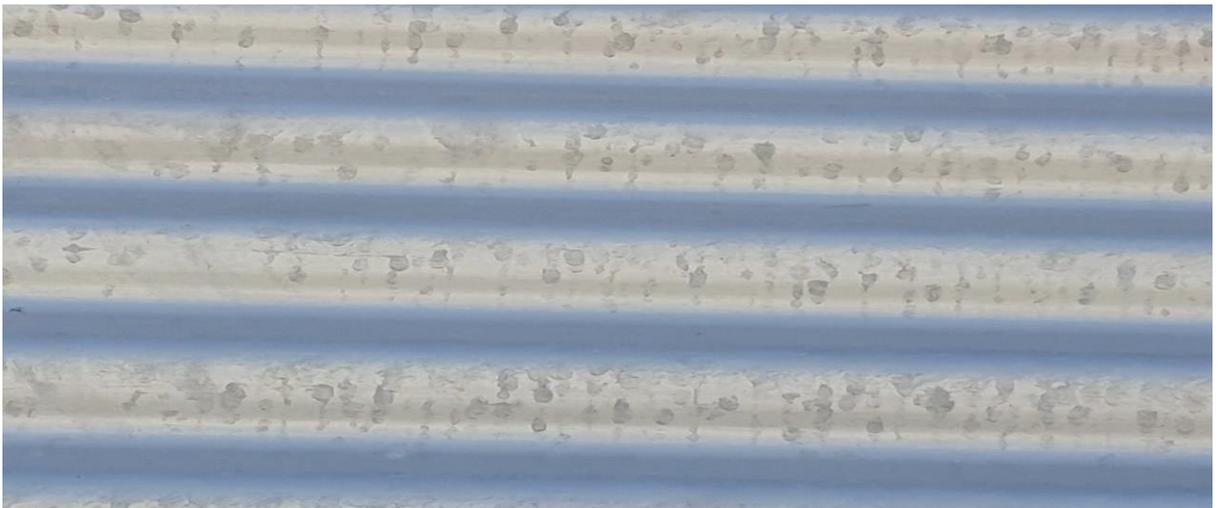
Examples of Project Photos

Pre painted Products – With extended exposure the polyester can be impacted





Unpainted Alloy Finish , the surface forms variants of the surface oxides resulting in an inconsistent appearance.



The use of borehole water on the surface of Pre Painted and Bare Alloy Coated products should be maintained and the performance monitored. Ensuring the residual compounds be cleared.

Resources

Surface Water and Groundwater quality in South Africa and Mozambique

By Paolo Verlicchi and Vittoria Grillinis

Salinity of irrigation water in Philippi farming area Cape Flats, Cape Town

By CD Reuben , Yongxin , Jonathan and Lincoln

Change in water Source requires Change in maintenance schedules

Positive Change brings Positive outcomes