

## GROUNDWATER

Water Sector Public Education and Outreach Programme Booklet

Groundwater contamination is serious as most of the time the contamination is irreversible or very difficult to remedy. Groundwater moves so slowly that problems take a long time to appear. However, by taking a few precautionary steps contamination can be avoided. Groundwater contamination occurs when manmade products such as petrol, oil and other harmful substances get into groundwater supplies and cause it to become unsafe and unfit for human use. Sources of groundwater contamination include storage tanks, septic systems, waste sites (hazardous and domestic), pesticides and many more. Groundwater pollution can make groundwater unsafe to drink and uneconomical to treat.

### Can contamination be prevented?

Surely contamination of groundwater resources can be prevented, but that could mean that no or restricted industrial and urban development can take place in the future. It is not only the large industries that pose a threat to groundwater quality, but also small businesses and even individuals.

It is so expensive to clean up a contaminated aquifer (if it is possible at all) it is much more preferable to prevent contamination from happening in the first place.

### Effects of ground water contamination

Contamination of ground water can result in poor drinking water quality, loss of water supply, degraded surface water systems, high cleanup

costs, high costs for alternative water supplies, and/or potential health problems

**FACT :** Groundwater dissolves many different compounds, and most of these substances have the potential to contaminate large quantities of water. For example, one litre of petrol can contaminate 1 000 000 litres of groundwater. In many cases, the problem is only noticed long after the aquifer is contaminated.

Source: *Groundwater: The Myth the Truth and the Basics (WRC)*

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WATER IS LIFE - SANITATION IS DIGNITY



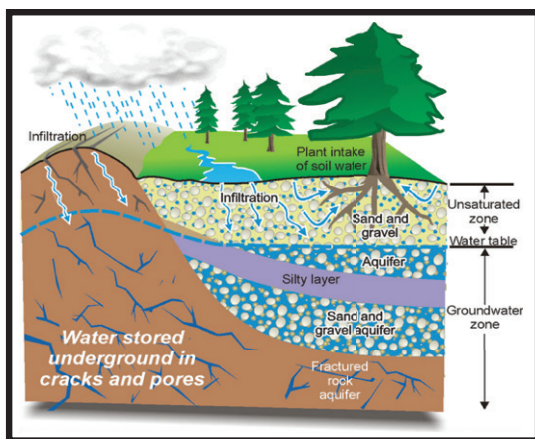
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Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA



## INTRODUCTION

Groundwater is the primary source of water supply to several towns in South Africa, however lack of awareness of groundwater's potential is still one of the main problems faced by the water sector. Groundwater is abstracted for different uses e.g. domestic, irrigation, industrial and mining.



One of the greatest challenges in implementing groundwater development programmes across South Africa remains poor perceptions of the resource.

### Definitions

Groundwater: is water that is found below the surface of the earth in the small cracks and spaces found in the rocks and sand underground. It originally comes from rain that has soaked into the ground over large areas, and is stored underground like a large sponge filled with water.

Boreholes: are holes drilled into the rock formations below the earth's surface using a drilling rig. By using a pump installed inside a borehole, water can be pumped from this underground sponge for people to use.

### Benefits of developing groundwater

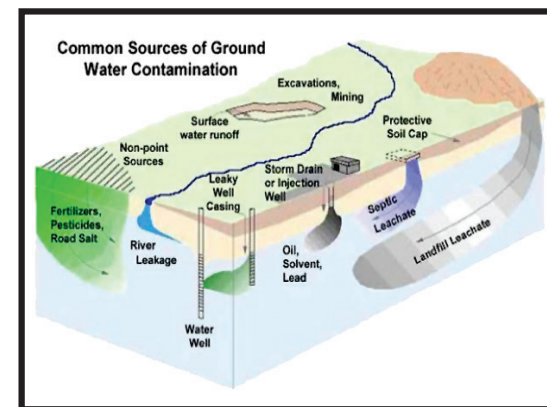
Groundwater is more resistant to the effects of drought than surface water, because very large amounts of water are stored underground, and rates of evaporation are low. This means that boreholes can continue to yield water long after rivers and streams have dried up if managed sustainably through good groundwater monitoring.

The natural quality of groundwater is usually good, with little or no treatment needed. This is because harmful microbiological pathogens such as bacteria and viruses usually cannot survive for long in aquifers. This means that expensive treatment plants, with associated operation and maintenance implications, are usually not necessary for small-scale supplies. Some treatment of groundwater is often carried out however (e.g. chlorination), it must be noted that not all groundwater is safe to drink without treatment.

### Some of the areas of concern

Protection of water resources encompasses management of quality and quantity of both surface water and groundwater. Protection of the quality of groundwater resources is an essential part to meeting the Sustainability Goals

Within municipalities in South Africa, groundwater is widely perceived as unreliable and a difficult source to manage. Experience on the ground indicates that many municipalities only turn to groundwater as a last resort, as opposed to the primary or supplementary resource, because groundwater is perceived as an unreliable and difficult source to manage.



Operation and maintenance of groundwater schemes- and failure of groundwater supply schemes is often blamed on the resource (the aquifer or the groundwater) rather than on the infrastructure used to abstract the groundwater. It is common to hear that "the borehole dried up", or "the groundwater ran out".

A lack of effective assessment, planning and management of groundwater resources can result not only in poor service delivery to water users, but also to significant detrimental impacts on the aquifer systems themselves.