

Drinking water quality in South Africa

A consumer's guide

The South African Constitution states that everyone has the right to have access to an environment that is not harmful to their health or well-being. This includes a constant supply of clean, safe drinking water. Consumers may therefore have questions about the quality of their drinking water. This pamphlet was prepared to make information more widely available and encourage people to gain a better understanding of the processes required for the provision of safe drinking water for the communities of South Africa.

What is safe drinking water?

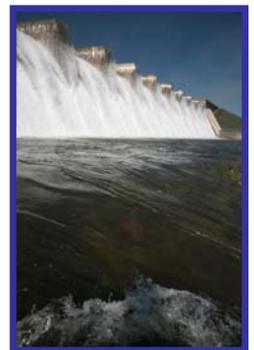
Safe drinking water is water that is acceptable for humans to drink and use for other domestic purposes such as food preparation and bathing. Drinking water should contain no harmful concentrations of chemical or micro-organisms, and should ideally have a pleasant appearance, taste and odour.

Access to safe drinking water is a basic human right and essential to people's health!



Where does my drinking water come from?

Our drinking water comes from two sources, surface water (rainfall and its runoff into rivers or dams), or groundwater (water that has collected in underground stores or aquifers). These sources are sometimes close to the communities that they serve, or may be some distance away. Therefore, when thinking about where drinking water is coming from, it is important not only to think of where the water is abstracted, but rather about the whole catchment - the area over which rainfall is caught and drains into a water source.



The whole catchment draining into this dam needs to be managed properly to protect this source of drinking water

The raw water is abstracted from the source (dam, river or borehole) and transported to a water treatment works where it is treated using different treatment processes. After treatment, the water is stored in reservoirs or tanks and then distributed to users.

Why is it necessary to treat drinking water?

Water must meet certain basic requirements to make it fit for domestic uses. The most important requirement is that it must be safe to drink. Many



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water sources contain harmful micro-organisms or other substances in concentrations that make the water unsafe to drink. These micro-organisms and substances must therefore be removed from the water by means of treatment processes to make the water fit for consumption.

When is it necessary to treat drinking water?

It is not possible to tell if water from a particular source has to be treated simply by visual inspection of the water. The reason is that water may contain substances that are not visible, but can make the water unfit for drinking. It is therefore essential to take samples and analyse the water that is to be used as a source for domestic use. An assessment must then be done to determine whether the water is fit to drink as it is, or whether certain contaminants need to be removed and what treatment processes are required to remove these substances.



The raw water source needs to be sampled to assess its quality

How is my drinking water treated?

The amount and type of water treatment varies with the source and quality of the water. Generally, surface waters require more treatment than groundwater, as surface waters are more likely to have been polluted by man.

When a water supplier abstracts water from a river or dam, it often contains suspended materials as well as contaminants. When the water gets to the

treatment works, the water supplier will add chemicals called coagulants to the water so that the dirt forms clumps that settle to the bottom. The water then flows through a filter for removal of the smallest of the contaminants. After coagulation and filtration, water suppliers then add chlorine or another disinfectant to kill bacteria and other germs. Disinfection is the most important process in making the water safe to drink.

Sometimes, water treatment is aimed at **maintaining** a desirable condition. For example, groundwater from deep boreholes may be clear and relatively free from bacteria, and may be able to be used without treatment. But, this water may be contaminated during distribution or in the home. Disinfection, in this case, is aimed at reducing the risks associated with contamination during transport and storage.

The more polluted the raw water source is, the more sophisticated the treatment required to produce high quality drinking water, and the higher the treatment costs.

If you do not have access to safe drinking water, a variety of simple treatment methods can be used to treat raw water for domestic use. Examples of typical treatment methods include:

- ❖ Filtering the water through a cloth to remove suspended material;
- ❖ Boiling of water (for at least 10 minutes) to destroy micro-organisms that may cause disease;



- ❖ Adding bleach to destroy micro-organisms (one teaspoon per 25 litres of water and allow to stand for at least 2 hours protected from sunlight);
- ❖ Adding chlorine granules (also known as HTH) to destroy micro-organisms (one teaspoon of granules per 200 litres of water and allow to stand for at least 2 hours protected from sunlight);
- ❖ Exposing water to sunlight to destroy micro-organisms (in a transparent container, with a small airspace, shaken after filling and every hour thereafter, and left in direct sunlight for 6 hours).

After treatment using these simple methods, water may be recontaminated if it is put into a dirty container or if it is not properly protected against pollution. Containers used for storing treated water must be properly washed and the containers covered to prevent contamination.

NOTE: Care should be taken when boiling water to prevent injuries through burn wounds, and bleach and chlorine granules should be stored safely out of the reach of children. Bleach should also be kept in a dark bottle out of sunlight as its quality deteriorates with time.

What if I have special health needs?

Sensitive or special needs groups include people who may have a particular medical problem which makes them more susceptible to poor water quality, including people living with HIV/AIDS, those undergoing chemotherapy, and transplant patients, amongst others. Infants, the frail elderly

and pregnant women may also be more vulnerable to contaminants in drinking water than the general population.

These sensitive groups may need to consider taking special precautions with their drinking water, including:

- ❖ Ensuring that drinking water taps are kept clean, and that animals do not have access to taps;
- ❖ Boiling drinking water if a drinking water problem is suspected, and
- ❖ Ensuring that containers used for storing drinking water are clean and are kept covered to prevent contamination.

Health and hygiene education is particularly important for sensitive groups, and can be effective in preventing water-related illnesses



Who is responsible for safe drinking water in South Africa?

The primary responsibility for the provision of safe drinking water rests with your Water Services Authority (Local or District Municipality). Water Services Authorities have a legal responsibility to:

- ❖ Monitor the quality of drinking water provided to consumers;
- ❖ Compare the results to national drinking water standards, and
- ❖ Communicate any health risks to consumers and appropriate authorities.



as described in the regulations to the Water Services Act (No. 108 of 1997) *Compulsory National Standards for the Quality of Potable Water*.

National drinking water standards are set to ensure the protection of public health. The South African National Standard (SANS) 241 Drinking Water Specification is the definitive reference on acceptable limits for drinking water quality in South Africa and provides guideline levels for a range of water quality characteristics. SANS 241 limits are comparable to international drinking water quality guidelines.



Monitoring of final waters is important in verifying that the water is fit for human consumption

Other important role-players responsible for safe drinking water are the Department of Water Affairs and Forestry and the Department of Health. The Department of Water Affairs and Forestry is responsible for managing South Africa's water resources for all its people, and also regulating the provision of drinking water by Water Services Authorities.

The Department of Health is responsible for coordinating incidents of water-related diseases in

South Africa and also providing interventions under emergency drinking water conditions. The Environmental Health Officers within the Water Services Authorities, are responsible for empowering the community through the provision of health and hygiene education, as well as undertaking drinking water quality monitoring at the point-of-use.

What are the costs of making water safe to drink?

While water is a natural resource, the cost of drinking water is related to the need to abstract it from a water source, purify the water to reduce the risk of negative health impacts and bring it to where it is required.



Some of the costs of drinking water are related to the costs of purifying the water to avoid negative health impacts

The costs of drinking water are rising as your Water Services Authority meets the needs of aging infrastructure, complying with national drinking water standards, and expanding water services to previously unserved areas.

What can I do if there is a problem with my drinking water?

Water Services Authorities (Local or District Municipalities) are required to have a Consumer Service which can serve as a conduit for consumers to report non-compliance to their Water Services Authority. Therefore, if you are



concerned about any aspect of the quality of your local drinking water, it is advisable to contact your Water Services Authority.

If you notice a bad or strong smell or taste in your drinking water which means that you cannot drink the water, or if you notice a smell or taste for the first time, you should contact your local Water Services Authority.

Common drinking water quality problems – Frequently asked questions

WHY CAN I SMELL AND TASTE CHLORINE IN MY DRINKING WATER?

To ensure that your water is safe to drink and contains no bacteria that are harmful to your health, your Water Services Authority allows a small amount of chlorine to remain in the water that is supplied to your tap. These small amounts of chlorine prevent bacteria growing in your pipes, and are not harmful to your health.



WHAT IF MY WATER APPEARS MURKY?

If your water appears murky or cloudy, it is recommended that you pour a glass of water, and:

- ❖ If the water clears from the bottom upwards, it suggests that there is dissolved air in the water and that the cloudiness poses no health risk;
- ❖ If the water clears from the top downwards, there may be a possible water treatment or reticulation problem, and you are

recommended to contact your local Water Services Authority.

WHAT ABOUT RUST OR SCALE IN MY KETTLE?

Another requirement for water treatment is that the water for domestic use must be chemically stable. This is an important requirement to protect pipes and fixtures in the distribution system. Water that is not chemically stable may cause corrosion (rust) in pipes or may result in the formation of a layer of chemical deposit or scale on the heating elements of kettles or geysers. Both corrosion and scale formation are undesirable. Corrosion may result in leaks in pipes and loss of water, and scale formation causes higher electricity costs to heat water.

It is your Water Services Authority's responsibility to ensure that domestic water is chemically stable.

HOW CAN MY PLUMBING CAUSE PROBLEMS?

Your water may dissolve small amounts of substances from your plumbing which can cause strange tastes, including:

- ❖ Bitter, metallic tastes from copper, iron or galvanized pipes, or
- ❖ Plastic tastes from plastic pipes.

Corrosion problems can also be due to poor quality pipes.

If your drinking water quality problem appears localised to your household, it is recommended that you contact a qualified plumber. However, if a number of households in your community report a potential drinking water quality problem, you



should contact your local Water Services Authority.

DO I NEED A WATER FILTER?

People living in areas where the drinking water supplied meets national drinking water standards do not require an additional water filter to meet health requirements because of the high quality of water supplied. Your Water Services Authority can provide you with information on the compliance of your drinking water with national standards.

In areas where safe drinking water is not yet supplied to consumers, commercially available point-of-use filters can be used, but they are relatively expensive. Home filtration units produce clean water, but not necessarily microbiologically safe water, depending on the nature of the filter medium. Addition of a small amount of chlorine is required to ensure that the water is safe to drink. Replacement of a water filter is very important from a health perspective. If the filter is not changed frequently, a build up of micro-organisms and chemicals may be released back into the water, resulting in a deterioration in quality.

Home water filters are mostly used for aesthetic reasons – to improve the taste or smell of treated drinking water.

WHAT ABOUT BOTTLED WATER?

Bottled water is sold all over South Africa, in many cases as an alternative to tap water.



While bottled water is useful in cases of a drinking water emergency, it is not a sustainable solution for South Africa due to its high cost. A litre of bottled water purchased at a supermarket costs approximately R10.00. To fill a one-litre bottle from your kitchen tap costs less than 1 cent – a 1000 fold difference!

The South African Natural Bottled Water Association (SANBWA) regulates the bottled water industry in South Africa from the source, through the bottling process, all the way to the retail shelf. Bottled waters bearing the SABWA logo thus indicate certified safe sources and adherence to quality standards.

My responsibility in Drinking Water Quality Management

There are a number of things that each and every one of us can do to help protect our drinking water, including:

- ❖ Be observant within your catchment and look out for activities which may pollute your drinking water source, such as:
 - Disposal of sewage, industrial wastewater or solid waste into storm water drains or rivers;
 - Excessive application of fertilizers to gardens - rather use natural fertilizers such as compost;
 - Cattle dip tanks which may contaminate drinking water sources with biocides.
- ❖ Report pollution incidents to your local Water Services Authority (Local or District Municipality) or catchment management forum;



- ❖ Dispose household chemicals properly and never pour chemicals down the drain or toilet;
- ❖ Conserve water by using water sparingly around the house;
- ❖ Attend public meetings to ensure that your community's need for safe drinking water is considered in making decisions about land use, and
- ❖ Report any suspicious activities or incidents of vandalism of water treatment plants or reservoirs to your Water Services Authority.

Protect your drinking water from catchment to tap!

We all need to take responsibility for our water resources and work together to maintain this precious resource.

ADDITIONAL INFORMATION

If you would like more information about your drinking water quality, you can get it from:

- ❖ Your local Water Services Authority (Municipality): You can see the results from water quality testing at your Water Services Authority. Customers Services staff will explain the results of tests and also tell you what is being done to rectify failures.
- ❖ The Department of Water Affairs and Forestry: Additional information on drinking water quality sampling, analysis, assessment, treatment and management can be found in the Department of Water Affairs and Forestry, Department of Health and Water Research Commission guides on the **Quality of Domestic Water Supplies** (<http://www.dwaf.gov.za/iwqs/report.htm>).
- ❖ More detailed information is available in the Drinking Water Quality Framework for South Africa which is accessible from the Department of Water Affairs and Forestry (Water Services Regulation (012) 336 6583 / 6870 / 6871), or your Regional Department of Water Affairs and Forestry office:
 - γ Northern Cape (053) 830 8800
 - γ Western Cape (021) 950 7100
 - γ Eastern Cape (043) 604 5400
 - γ Gauteng (012) 392 1300
 - γ North West (018) 384 3270
 - γ Limpopo (015) 290 1200
 - γ Mpumalanga (013) 759 7300
 - γ Kwa-Zulu Natal (031) 336 2700
 - γ Free State (051) 405 9000



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