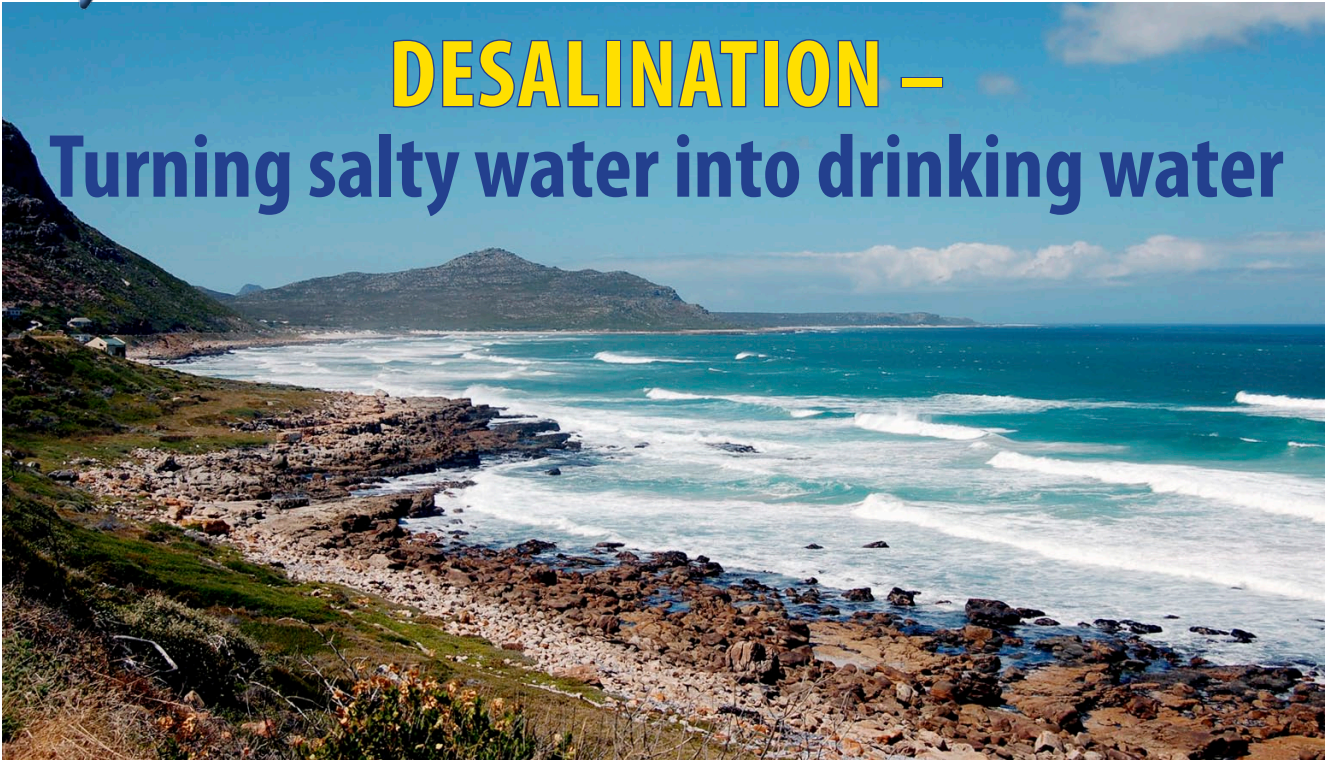


DESALINATION – Turning salty water into drinking water



Called the ‘blue planet’ or the ‘water planet’ the Earth’s surface is 70% covered with water. Unfortunately, a very tiny percentage of that water is fit to drink. But what if we could make it drinkable?

Cities are growing and more people are populating the Earth, requiring ever more water for drinking, cooking, washing and growing food, driving industry and generating electricity. This places increasing pressure on existing water supplies, pressing countries to look for alternative sources of water.

Through the years this growing demand for water has led to the development of a sophisticated process called desalination which turns seawater or other brackish water (like salty groundwater) into water that is fit for drinking and other uses. Desalination used to be an expensive process that used a lot of energy, but improvements in the technology is making this a more attractive option, especially for coastal cities and towns.

One of the remaining challenges is what to do with the brine (the waste that remains after treatment). At present, the most common approach is to return the brine to the sea. Other environmental considerations are choosing a source of power as well as site selection. Generally, desalination plants are

Small desalination plants, such as this one at Madibogo, in North West, are used to treat brackish groundwater for rural communities.



The desalination plant at Bitterfontein in the Western Cape was the first to be established in South Africa for domestic purposes.

said to have smaller footprints than conventional water treatment plants (in other words, they take up less space). Small, easily transportable desalination units are also used to treat water in emergencies.

There are several ways of separating the salt and other impurities from seawater, but two methods are used 90% of the time, namely multistage flash and reverse osmosis. The multistage flash method uses heat to convert salt water into fresh water (the term 'flash' refers to rapidly bringing the water to a boil, which happens multiple times, or in stages). Reverse osmosis, which is the most commonly used desalination technology in South Africa, works by forcing seawater through many layers of a specialised membrane under high pressure, leaving the salt concentrate on one side of the membrane and desalinated water on the other.

At present, the Middle East is the largest market for desalination, but there are also large-scale desalination programmes in Australia, Algeria, the USA and Spain. South Africa also has a few desalination plants, although they are nowhere near the size of plants found in the larger markets. Until recently there were only three active desalination plants (for domestic purposes) in South Africa, namely a plant at the Bushmans River Mouth providing potable water to Kenton-on-Sea, one on Robben Island and one at Bitterfontein on the West Coast.

Recent droughts at the Southern Cape, however, have forced municipalities to consider desalination to augment dwindling supplies. Mossel Bay now has a desalination plant, as does Sedgfield, and the plants are slowly growing larger. George and Bitou are also in the process of

BUILD YOUR OWN DESALINATION PLANT!

Instructions

- Fill a bowl with salt water and set an empty glass at the centre.
- Cover the bowl – empty glass and all – with plastic wrap that has a small hole poked in the middle.
- Place the contraption in direct sunlight.


How does it work?

- The salt water will evaporate, leaving salt crystals behind.
- The condensation that rises gathers on the plastic and drips into the empty glass.
- The result is fresh water that has been desalinated.

Source: www.howstuffworks.com

acquiring desalination plants. Desalination is also considered by many coastal municipalities as a future option to grow water resources. Also, desalination does not only apply to seawater. Areas with groundwater resources that are brackish can also benefit from using desalination technology to make this water usable. □

DID YOU KNOW?



- Around 97% of the world's water is too salty to drink.
- There are close to 14 500 desalination plants around the world. Over the last five years, on average 800 new desalination plants have been constructed every year.
- The world's largest desalination plants are located in the Middle East.
- Desalination plants provide more than 70% of the drinking water requirements of Saudi Arabia (more than ten million m³/day).
- The world's largest operational seawater reverse osmosis plant is located in Hadera, Israel, with a capacity of 500 000 m³/day of water (20% of Israel's domestic potable water requirement)