The issues of decreasing water quality, increasing water scarcity and deteriorating or dysfunctional municipal water infrastructure leading to a potential water crisis in the country have featured strongly in the media. South Africa’s water sector faces numerous challenges, e.g. water deficits in an increasing number of water management areas; water pollution and decreasing water quality that affects not only net availability of water but also negatively affects human health; ageing water and wastewater infrastructure; a severe lack of skilled human resources; the impact of climate change on water resources; the illegal use of water; and the inappropriate use of funds by different spheres of local government.

Is the state of water security deteriorating?

Water is critical in sustaining life and it is crucial to economic growth and social development, as well as for environmental sustainability. In global terms, South Africa’s freshwater resources are scarce, extremely limited and disproportionately available, both in time and space, relative to demand. The average rainfall of 497 mm/year is well below the global average of 860 mm/year. South Africa is already categorised as water stressed with an annual freshwater availability of less than 1 700 mm³/person (the index for water stress).

The central question being asked is: Does South Africa have sufficient freshwater resources to sustain both its path of economic growth and its population growth with concomitant needs? In addressing this question, the Department of Water & Environmental Affairs (DWEA) has taken a long-term perspective and is assessing and addressing in a very detailed manner the quantity of water available in relation to projected demand, and ways of addressing imbalances where they exist. This is done in the form of reconciliation strategies, which have been completed for all of the country’s major water supply systems, and are being followed by reconciliation studies for every town in South Africa – a process to be completed by mid-2011.

According to the National Water Resource Strategy of 2004, the total annual demand for freshwater in South Africa in 2000 amounted to 12 871 million m³, just slightly less than the available yield of freshwater of 13 227 million m³. This means that 98% of the national water resource was already allocated or in use in 2000, with little surplus water left.

Based on the latest available data (including the completed reconciliation studies), five of the nineteen water management areas (WMAs) were already experiencing water shortages in 2000, while only four experienced water surpluses and the remainder were still in balance. A water supply/demand gap has thus already been experienced in five WMAs.

The Institute for Futures Research looks at the current state of affairs and provides some pointers on what the business community and industry can do to relieve water stress.
The status of water security in the major metropolitan areas of South Africa is a major concern. The potential for water resource development exists mainly in the southern parts of KwaZulu-Natal and further groundwater utilisation, the potential for water resource development exists mainly in the southern parts of KwaZulu-Natal and the Eastern parts of the Eastern Cape.

Of particular concern is the status of water security in the major metropolitan areas of South Africa. Not only are these the hubs of economic growth (and economic development leads to increased water use), but these are also the areas experiencing relatively high population growth rates due to rapid urbanisation, which, in turn, increases the stress on water infrastructure. In fact, it is stated by DWEA that based on the existing reconciliation strategies, “water shortages are predicted for the majority of large towns (not only for the metropolitan areas) in the short to medium term, necessitating urgent intervention.”

The availability of quantity of water is closely linked to the quality of water. If the latter deteriorates, it has a negative impact on the net availability of water. In South Africa, water resources are comprised of the following three sources, viz. 77% is sourced from surface water (e.g. dams and rivers), 14% from return flows (e.g. sewage and effluent purification) and 9% from groundwater (e.g. boreholes). The major sources of water pollution include uncontrolled sewage, poorly managed wastewater treatment works, chemical discharges, petroleum leaks and spills, dumping in old mines and pits, human settlements, and agricultural chemicals that are washed off or seep down from farm fields.

The possibility of Gauteng, a largely metropolitan province, experiencing water shortages as soon as 2013, especially if there is a period of severe drought, has been debated in the media. Although former Minister of Water Affairs & Forestry Lindiwe Hendricks reacted to this by stating that the water shortage in the province can be averted, given the recent decision of Cabinet to go ahead with Phase 2 of the Lesotho Highlands Water Project, subject to the conclusion of a protocol with the Lesotho government, the project is expected to be completed in 2019 – six years after the expected 2013 water shortage in Gauteng.

WHAT ABOUT WATER QUALITY?

The recent severe cholera epidemic in Zimbabwe, which infected more than 90 000 people and caused the death of more than 4 100 people comes to mind. Although a host of factors combined to make this outbreak of cholera so devastating, the main cause was the total breakdown of water and sanitation infrastructure. Compared to Zimbabwe, South Africa has a well developed water and sanitation infrastructure system in place, and tap water is still among the best in the world (excluding some rural areas), according to DWEA. However, about 5 million people still lacked adequate and safe water supplies in 2008, while 15 million still lacked basic sanitation in spite of millions of South Africans gaining access to a formal water supply and sanitation services since 1994. Until this backlog is completely eradicated, the threat of waterborne diseases remains a reality.

In general, the quality of South Africa’s freshwater resources is deteriorating. According to Dr Anthony Turton, Director Touchstone Resources, South Africa’s water resources have lost their dilution capacity. “so all pollutants and effluent streams will increasingly need to be treated to ever higher standards before being discharged into communal waters or deposited in landfills.” Decades of mining for gold and other minerals have left much of the water supply heavily polluted with heavy metals and other pollutants.

A 2008 CSIR study entitled State of the Nation Report, found cyanobacterial blooms recorded in many “if not most” of river and reservoir systems – from where most of South Africa’s drinking water is obtained – because of “prevailing high levels of eutrophication caused by inadequate treatment of domestic and industrial effluents” discharged in their catchments.

“The status of water security in the major metropolitan areas of South Africa is a major concern.
affected by failing infrastructure (water puri-
ification and reticulation infrastructure), poor
wastewater collection and treatment systems,
lack of human resources (capacity and skills)
to meet efficient standards. The impact of
poorly managed wastewater treatment works is
the inability to sustain safe drinking water,”
said DWEA in the Water for Growth & Devel-
opment Framework.

Addressing a municipal conference on water
and sanitation in Johannesburg in 2008,
former Minister Lindiwe Hendricks said that
far too many municipal wastewater treatment
works were operating below the required
standards. “Indications were that 60% of the
treatment plants, the facilities that treat sew-
age, required maintenance or intervention,
with poor compliance to the required effluent
standards.” According to Dr Turton, South
Africa has failed to maintain its investment in
the infrastructure needed to maintain a clean
water supply. Capital investment in water and
sanitation infrastructure peaked in the 1980s
and has since declined drastically.

Not only is there a need to invest in new
infrastructure in areas that lack safe water
supplies and sanitation services, but there is
also the need to invest in the upgrading and
maintenance of existing water and sanitation
infrastructure. According to DWEA, limiting
factors for addressing backlogs and expand-
ning service delivery include:

- Lack of skilled contractors to render serv-
ces and poor construction supervision,
which diminishes the life expectancy of
infrastructure;
- Lack of municipal staff (especially
engineers, scientists and technicians)
to operate and maintain water services
infrastructure; and
- Absent or weak municipal systems for
infrastructure management.

IMPLICATIONS

South Africa is a water scarce country with
demand already exceeding supply in certain
WMAs and cities. In addition, water quality
is deteriorating and many municipalities are
unable to maintain ageing water and waste-
water infrastructure particularly due to a lack
of skilled personnel such as engineers and
technicians. Factors that could worsen the
water situation in South Africa are the impact
of climate change on precipitation, increasing
urbanisation, population growth, expansion
of business activity and increasing affluence.
If South Africa’s water resources are not
properly managed, the country is heading for
a crisis.

Although the provision of freshwater and
sanitation services is primarily the responsi-
bility of the government, water is everybody’s
business and everybody’s responsibility. In
conclusion, the main recommendations of the
Water for Growth and Development Frame-
work (WGDF), launched by DWEA earlier this
year are summarised, that is how government
intends to avoid a water crisis, followed by
some pointers on what industry/business can
do to alleviate water stress.

RECOMMENDATIONS BY GOVERNMENT

The WGDF is intended “to guide actions and
decisions that will ensure water security in
terms of quantity and of quality to support
South Africa’s requirements for economic
growth and social development. The main
recommendations of the framework are:

- Strengthening institutional capacity;
- Mainstreaming water – i.e. water must
be placed at the heart of all development
planning decisions;
- Diversifying the water mix. While surface
water will remain the predominant source
of water in the long term, DWEA expects
surface water to contribute proportion-
ately less (65% by 2040 compared to
77% in 2008), with significant increases
in return flows through the treatment of
urban and mining effluent and desalina-
tion. The latter is considered to be highly
feasible for limited use in coastal loca-
tions;
- Promoting water conservation and water
demand management;
- Promoting and maintaining water quality;
- Addressing service backlogs and achiev-
ing the 2014 target for universal access
to water and sanitation services;
- Changing water use behaviour for the
future, especially the unlawful and dam-
aging extraction from, and pollution of the
Vaal River system by commercial users
and the extent of water use inefficiencies
among commercial irrigation agriculture;
- Nurturing attitudinal and behavioural
changes towards the value of water by
means of national awareness campaigns.

THE ROLE OF INDUSTRY/BUSINESS

The business community forms part of the
solution to issues or problems related to
water and sanitation. Jack Moss of the Busi-
ness Action for Water recently stated at the
Fifth World Water Forum, in Istanbul, Turkey:
“Without water, there is no business. Without
business, there is no water.”

According to the World Business Council for
Sustainable Development, industry/business
can do the following to alleviate stress on
water resources:

- Put its house in order by
  - Measuring and monitoring water use –
understanding the water ‘footprint’ of
the business both inside and outside
the corporate fenceline;
  - Continuing to reduce water consump-
tion per money unit of output and work
towards the goal of zero discharge by:
    - Recycling and reusing water;
    - Lowering toxic and other contami-
nants in all operations involving
water;
    - Changing production processes to
be more water efficient
  - Encouraging suppliers and pur-
chasers up and down the supply
chain to adopt best management
practices – assisting small- and
medium-sized enterprises to
improve water management;
  - Innovating – searching for new
more efficient water treatment
technologies.

- Enter into creative partnerships with:
  - Municipalities where business oper-
ates to develop cost-effective water
supply and sanitation options;
  - Non-governmental groups to encour-
age water conservation and improved
water management systems; and
  - The scientific community to improve
understanding of water resources and
their management and to develop
technologies to get the most value of
the water cycle.