



Market Intelligence Report

**Water**

**2014**

|  |    |
|--|----|
| Table of contents  | 2  |
| List of acronyms   | 3  |
| 1. Overview of the water sector  | 5  |
| 2. Water governance structure and regulatory framework in South Africa           | 8  |
| 2.1 Water governance structure in South Africa                                   | 9  |
| 2.2 Water value chain  | 9  |
| 3. Western Cape context  | 10 |
| 4. Future outlook and opportunities for the water sector                         | 12 |
| 4.1 Water supply   | 12 |
| 4.2 Water reuse  | 12 |
| 4.3 Infrastructure maintenance and new infrastructure                            | 12 |
| 4.4 Berg River Improvement Plan  | 13 |
| 4.5 Municipal grant funding available  | 14 |
| 4.5.1 Municipal Infrastructure Grant (MIG)                                       | 14 |
| 4.5.2 Regional Bulk Infrastructure Grant (RBIG)                                  | 14 |
| 4.5.3 Municipal Water Infrastructure Grant (MWIG)                                | 14 |
| 4.5.3 Human Settlements Development Grant (HSDG)                                 | 15 |
| 4.5.4 Rural Households Infrastructure Grant (RHIG)                               | 15 |
| 4.5.5 Skills development and industry bodies in the water sector                 | 15 |
| 5. Water Industry Bodies   | 16 |
| Appendix 1: Other governmental role players in the water sector                  | 18 |
| Appendix 2: Major raw water storage dams and capabilities                        | 19 |
| Appendix 3: Main DWA projects and private sector initiatives in the Western Cape | 20 |
| Appendix 4: Institutions providing water training courses                        | 23 |

## List of acronyms

|         |   |
|---------|---|
| AMP     | Asset Management Plan   |
| ASGISA  | Accelerated and Shared Growth Initiative for South Africa                       |
| ASR     | artificial storage and recovery   |
| AWARD   | Association for Water and Rural Development                                     |
| CMA     | Catchment Management Agencies   |
| DOHS    | Department of Human Settlements   |
| DWA     | Department of Water Affairs   |
| ESETA   | Energy Sector Education and Training Authority                                  |
| EWSETA  | Energy and Water Sector Education and Training Authority                        |
| GDP     | gross domestic product  |
| IAMS    | Infrastructure Asset Management Strategy  |
| ILI     | Infrastructure Leakage Index  |
| MBR     | membrane bioreactor   |
| MI/d    | million litres per day  |
| MWIG    | Municipal Water Infrastructure Grant  |
| NDP     | National Development Plan   |
| NGO     | non-governmental organisation   |
| NWA     | National Water Act, Act 36 of 1998  |
| NWRS2   | National Water Resource Strategy  |
| PICC    | Presidential Infrastructure Coordinating Commission                             |
| SAAWU   | South African Association of Water Users  |
| SANCIAH | South African National Council of the International Association of Hydrologists |
| SETA    | Sector Education and Training Authorities                                       |
| SIP     | Strategic Integrated Projects   |
| WCG     | Western Cape Government   |
| WESSA   | Wildlife and Environment Society of South Africa                                |
| WISA    | Water Institute of Southern Africa  |
| WMA     | Water Management Areas  |
| WRC     | Water Research Commission   |
| WSA     | Water and Sanitation for Africa Foundation                                      |
| WSA     | Water Services Act, 1997  |
| WSA     | Water Services Authorities  |
| WSP     | Water Service Providers   |
| WSP     | Water Stewardship Programme   |
| WWTW    | Waste Water Treatment Works   |

  
**30**

South Africa is rated the 30th driest country on the planet.

## Executive summary

This report provides a brief overview of the water sector in South Africa with a focus on the Western Cape. It discusses the main applicable regulations and policies, how the sector operates and potential focus areas for the country. The report also provides an indication of opportunities available to the private sector.

Given that the country is water-stressed, water management remains a key national focus for the South African government and the Western Cape Government (WCG) at a provincial level. The water sector is governed by two Acts, and there are various regulations in place to guide best practice and encourage good performance in the sector.

The agricultural sector leads the demand for water in the country. There is a range of projects in place to help maintain a sufficient supply of good quality water to meet South Africa's needs. That said, the sector faces two key challenges: loss of non-revenue water caused by leaks, broken infrastructure and billing system failure; and lack of adequate skills to maintain the water infrastructure.

In the Western Cape, various projects have been set up to address water quality, regulate supply and install and maintain infrastructure. Government grants provide funding opportunities for water-related projects. The need for skills development is addressed by various training courses in the province and around the country.

# 1. Overview of the Water Sector

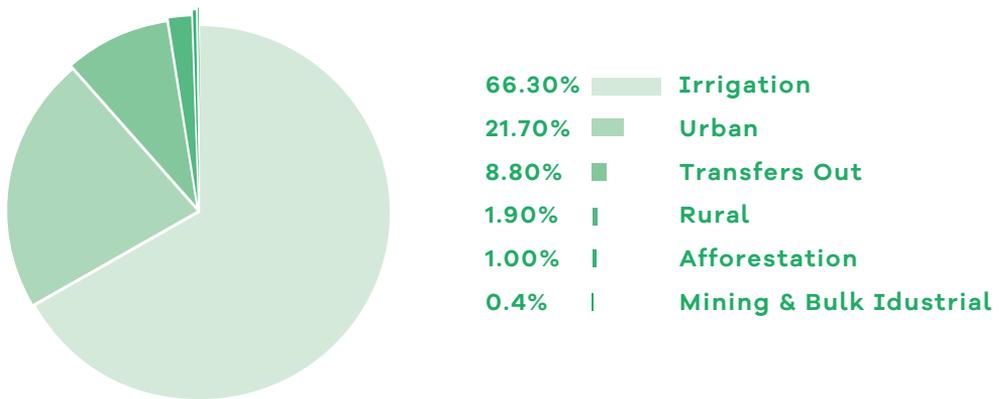
In the context of this report, the water sector is understood to include all legislators, organisations and service providers that play a role in the water value chain. This covers supply, management and wastewater treatment and discharge. With extreme climate and rainfall fluctuations, South Africa is ranked as the 30th driest country in the world.

The country's water usage typically consists of:

- 77% surface water,
- 9% groundwater, and
- 14% re-use of return flows.

South African water resources management involves catchment management, river systems, water storage, water abstraction and return-flow management. According to the Department of Water Affairs (DWA) in 2013, there are 1 286 municipal and privately owned wastewater treatment works in South Africa, of which 826 are municipally owned. The bulk of water in the Western Cape, as in the rest of South Africa, is used for agricultural and irrigation purposes, as illustrated in Figure 1 below.

**Figure 1: Total surface water used per sector in 2000 for the Western Cape**



(Department of Water Affairs and Forestry, 2004)

The quality standards requirements of potable water in South Africa are listed in the South African National Standard (SANS) 241-1: 2011, 241-2: 2011 Drinking Water.

Generally, the presidential targets for drinking water quality are to:

Achieve 99% drinking water quality compliance by 2013

Reduce water losses by half by 2014

(*The Blue Drop and No Drop Handbook, Water Services Regulation, DWA; 2013*)

### **The average 2011-2012 municipal water tariffs varied from:**

**R2,74 to R10,98/kℓ** for domestic use,

**R7,31 to R10,68/kℓ** for commercial use, and

**R7,98 to R10,85/kℓ** for industrial use,

### **The average tariff for raw water was**

**R1,37/kℓ, R5,41/kℓ** for bulk water and

**R100** per month for municipal sanitation

(Department of Water Affairs, 2013).

In addition, the National Development Plan 2030 (NDP) (<http://www.info.gov.za/issues/national-development-plan/>) refers to ambitious water-related projects for completion between 2017 and 2020.

At national level, water management remains a key focus for the South African government. At the Green Economy National Youth Summit in June 2013, Minister Edna Molewa referred to the Green Economy Strategy, promulgated in 2011, which identified water management as one of eight key focus areas.

These projects fall within the investment programme for water resource development. They are related to: water-reuse and groundwater use in the Western Cape; strengthening water services management; establishing regional water and wastewater utilities to support municipalities by 2017; and the completion of phase two of the Lesotho Highlands Project to supply the Vaal system by 2020.

It is worth noting that the Lesotho Highlands Phase 2 Project – which is a key focus of the Trans-Caledon Tunnel Authority – has been approved and will commence in the near future.

In 2008, the DWA introduced two incentive-based regulations which are: the Blue Drop Certification Programme for drinking water quality management regulation and the Green Drop Certification Programme for wastewater quality management regulation.

**Critical performance indicators for Green Drop include:**

Design and operating capacity of the wastewater treatment works

Compliance of the effluent to agreed standards

The management authority's technical skills and the condition of infrastructure such as asset management practices.

Blue Drop introduces excellence requirements, based on regulated norms and standards and international best practice, to encourage proactive management and regulation of drinking water quality management.

The Blue Drop and Green Drop programmes are rating tools for the performance of municipal water supply or wastewater systems scored against a set of requirements common across the nine provinces in South Africa. These reports highlight the problem areas and required actions to improve the quality of potable and effluent water in municipalities. In addition, the programme has created an incentive for municipalities to improve their performance every year.

These reports are publicly accessible on the DWA's website at [www.dwa.gov.za](http://www.dwa.gov.za).

One of South Africa's main water management challenges is non-revenue water. Non-revenue water is defined as: 'all the water lost through physical leakage or commercial losses i.e. meter under-registration, billing errors, theft etc. as well as any unbilled authorised consumption, etc.'" (McKenzie et al., 2013). According to the latest Water Research Commission (WRC) study, non-revenue water constitutes approximately 36.8% of the water supplied in South Africa. A recent DWA assessment of the eight metropolitan areas, which account for 46% of the country's urban water use, showed that Cape Town had the lowest Infrastructure Leakage Index (ILI) of 2.1 compared to the highest ILI of 8.3 for Johannesburg.

Another major challenge in the water sector is the lack of adequate skills. For example, a municipal demarcation study, conducted by the Municipal Demarcation Board in 2011, indicated that only 72% of municipal posts were filled and only 76% of municipal organogram posts were budgeted for.

An estimated R360 billion, or about 15%, of South Africa's present gross domestic product (GDP) is needed within the next 15 years to secure South Africa's water future, primarily for maintaining and increasing water treatment plant capacity (de Villiers, S and de Wit, M., 2010). These figures again underline the importance of addressing the skills shortage in this country.

Appendix 4 presents a list of training courses available in South Africa.

## 2. Water governance structure and regulatory framework in South Africa

In South Africa, the DWA is governed by two Acts: the National Water Act (NWA), Act 36 of 1998 and the Water Services Act (WSA) 1997. The NWA redefined water rights in the country and established a new framework to mandate and regulate water resources. The WSA, promulgated in 1994, defined the role of DWA as regulator, the role of water boards as bulk providers and the role of municipalities as service providers.

The DWA's main roles are to lead and regulate the water sector, develop policies and strategies and provide support to the sector. The DWA operates at the national, provincial and local levels across the water value chain. The water value chain includes water resource management, water abstraction, water processing and distribution of potable water, and the collection, treatment and discharge of wastewater. However, the DWA does not execute all of these functions as some are constitutionally assigned to appropriate sector partners.

Published in 2012, the second National Water Resource Strategy (NWR2) has been developed to support the implementation of the NWA.

### The NWR2 has three key objectives, as follows:

Increase water's contribution to the economy and to job creation

Protect, develop and control water resources in a sustainable and equitable manner

Support the elimination of poverty and inequality.

Regional bulk water distribution is managed by water boards, municipalities and the DWA. Water boards and some of the larger metropolitan municipalities (metros) are also responsible for purifying water to potable standards. Providing water services – which means water supply and sanitation – is the constitutional responsibility of local authorities such as metros, local or district municipalities. These local authorities act as WSAs and sometimes also as water service providers (WSPs) for all communities in their areas of jurisdiction. There are only 152 designated WSAs out of the 278 municipalities across the country. In the Western Cape, the Cape metro and 24 municipalities are all designated WSAs.

The DWA is currently developing an Infrastructure Asset Management Strategy (IAMS) to provide tools and processes to assist WSAs to maintain and manage their water-related assets. Every WSA is legally required to develop an Asset Management Plan (AMP) by the DWA.

Some WSAs have contracted out the management of their wastewater to bulk WSPs. The responsibility of ensuring effective service delivery still rests with WSAs.

The responsibility and authority for water resources management rests with catchment management agencies (CMAs) and, at a local level, with water user associations. This is illustrated in Figures 2 and 3.

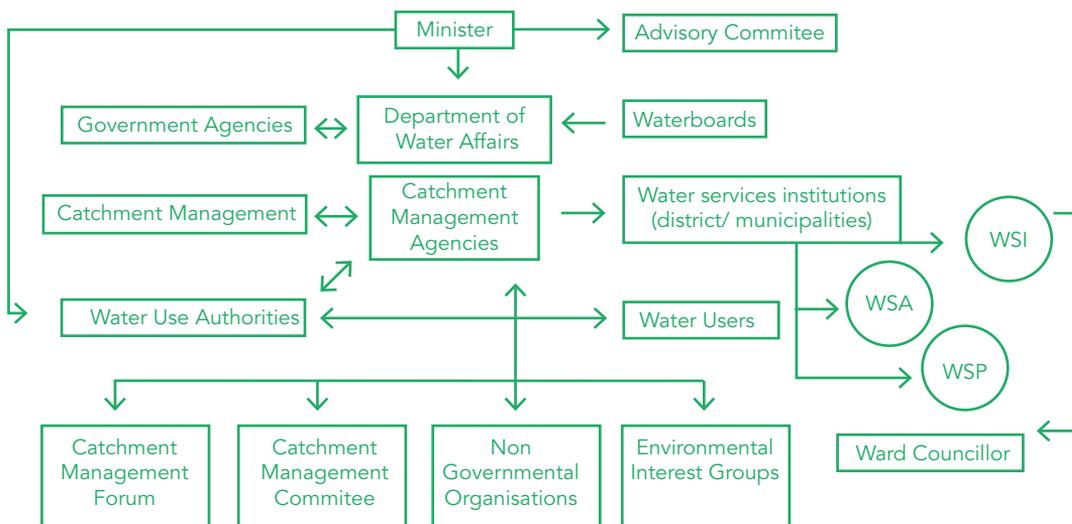
**There are nine planned water management areas (WMAs) whose management will be shared between CMAs across the country. They are:**

|   |                                      |   |
|---|--------------------------------------|---|
| Limpopo,<br>Pongola-Mzimkulu,<br>Mzimvubu-Tsitsikama, | Olifants,<br>Vaal,<br>Breede-Gouritz | Inkomati-Usuthu,<br>Orange,<br>Berg-Olifants. |
|---|--------------------------------------|---|

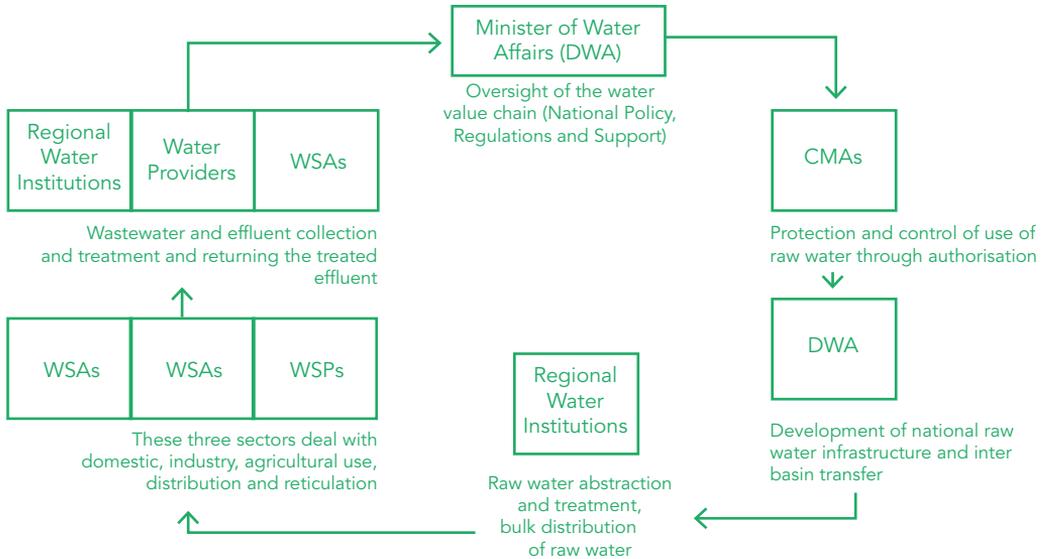
**Currently only the Inkomati-Usuthu and Breede-Overberg are operational as CMAs.**

Figures 2 and Figure 3 present an overview of the water governance structure and regulatory framework in South Africa, and also show how the different bodies are interlinked. Details of government bodies listed in Appendix 1.

**Figure 2: Overview of the water governance in South Africa**  
(Department of Water Affairs, 2013)



**Figure 3: Value chain of water infrastructure in South Africa**  
(Mazibuko & Pegram, 2006a; DWAf, 2001)



### 3. Western Cape context

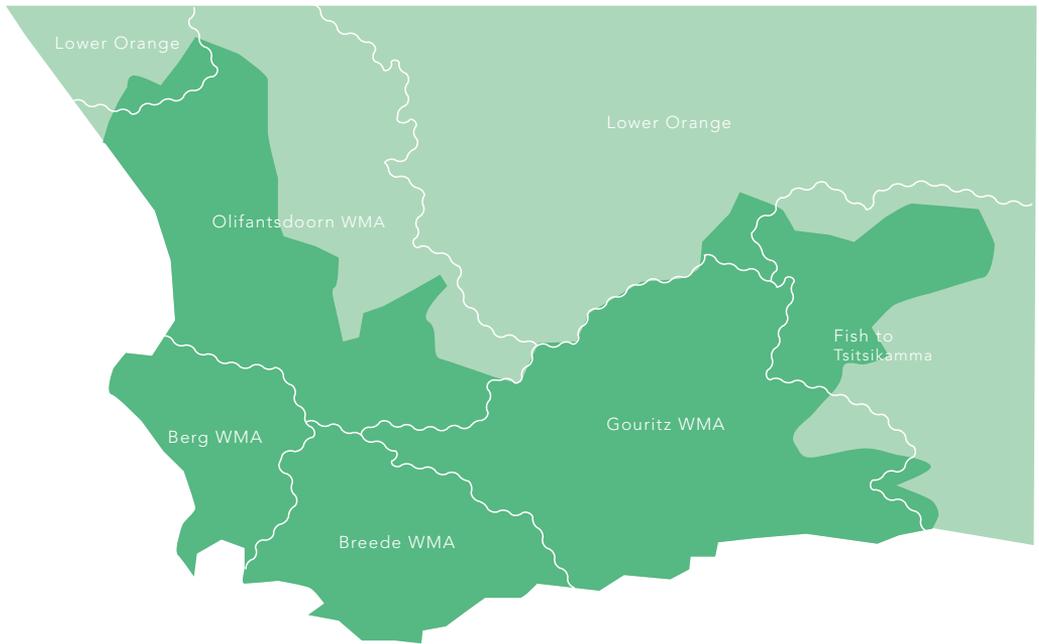
The average forecasted growth in the Western Cape regional economy is estimated to be 4.2% per annum over the next five years (Western Cape’s Provincial Economic Review and Outlook for 2011). The current breakdown of water usage in the Western Cape is presented in Figure 4.

The Western Cape is a water-stressed region. The total water demand is estimated at 2 047 x 106m<sup>3</sup> per annum (de Villiers, S. and de Wit, M., 2010). This demand is met mainly through the six major dams in the province as presented in Appendix 2. There is genuine understanding at provincial government level that water could be a significant constraint on the region’s economic development if not well managed. This is particularly relevant to the prospect of economic and industrial growth as well as the provision of potable water for the growing urban population. At the same time, the make-up of the regional economy directly influences the province’s total water footprint.

**Figure 4: Water usage in the Western Cape**



**Figure 5: Water management areas in the Western Cape**



The Western Cape has an existing artificial recharge scheme based in Atlantis that uses storm and wastewater. The Atlantis Water Resource Management Scheme has recharged and recycled water for almost three decades. This artificial recharge supplies approximately 30% of Atlantis' groundwater supply (*Groundwater Strategy, 2010*).

The Western Cape currently comprises six desalination plants. There is a preference for using reverse osmosis, which has become more widely practised in South Africa (*Water 25 Degrees in Africa, Volume 7, Number 5 - September/October 2012*). In addition, two feasibility studies are underway to investigate the viability of a desalination plant to supply water for the City of Cape Town and Lamberts Bay.

## 4. Future outlook and opportunities for the water sector

This section presents some of the key actions identified to help the water sector meet future demand. Main DWA projects and private sector initiatives in the Western Cape listed in Appendix 3.

### 4.1 Water supply

The DWA predicts that by 2030, up to 10% of the country's urban water supply could come from water desalination plants. Based on the draft NWRS2, it is anticipated that desalination will play an important role in South Africa's future water security. The NWRS2 states that the DWA will ensure that desalination is properly considered as an option for meeting future water requirements in its integrated water resource planning processes.

In the context of increased climate change risk, DWA will actively promote and support the development and implementation of desalination projects that compare favourably to other alternative options. Another key objective will be to ensure that energy and water planning are well integrated.

The DWA and WRC developed an Artificial Recharge Strategy, which was completed in 2007. Its vision was to 'use natural sub-surface storage as part of integrated water resource management wherever technologically, economically, environmentally and socially feasible'.

### 4.2 Water reuse

While the potential for water reuse in South Africa has not been thoroughly explored to date, there are some initiatives in place across the country. For example, after an open call, the City of Cape Town is currently reviewing bids to develop a 150 million litres per day (ML/d) water reclamation scheme for potable use.

### 4.3 Infrastructure maintenance and new infrastructure

The blueprint for a growing South African economy depends heavily on providing and maintaining adequate infrastructure of public buildings, roads, water and sewerage systems, electricity and other services. The Accelerated and Shared Growth Initiative for South Africa (ASGISA) places the maintenance of existing infrastructure high on the developmental agenda as a key to sustainable development and economic growth. Wastewater treatment works are of particular concern. Other sectors of concern include water and sewer reticulation, on-site sanitation, some provincial and municipal roads, and some provincial health and education facilities.

Although most municipalities have limited budgets and technical staff, there are opportunities to provide technical and expert support for water-related infrastructure maintenance. This is a gap that needs to be filled.

#### 4.4 Berg River Improvement Plan

In 2012, the WCG undertook to develop the Berg River Improvement Plan (BRIP) to address water quality concerns in the Berg River. The BRIP highlights the current status of pollution sources and the various actions that have been or are currently being undertaken by municipalities and different departments in the Western Cape. It identifies short-term actions – meaning  $\leq$  five years – and long-term actions – meaning five to 30 years, and their financial implications. The BRIP is to be reviewed and updated every five years.

A Water Stewardship Programme (WSP) for the Berg River was proposed.

#### **This WSP has six main tasks to meet the identified objectives**

- 1: Establish a Berg River water quality monitoring programme
- 2: Upgrade wastewater treatment works and train process controllers
- 3: Upgrade informal settlements
- 4: Advocate best practice in agricultural, industrial and domestic land-use
- 5: Riparian zone rehabilitation and management, also known as the buffer zone
- 6: Pricing water management in the Berg River catchment.

*(Berg River Improvement Plan, 2012)*

## 4.5 Municipal grant funding available

The annual Division of Revenue Act sets out various government grants available for water-related projects. These are presented in this section.

### 4.5.1 Municipal Infrastructure Grant (MIG)

The MIG is the largest conditional capital grant and provides funding for a basic level of municipal infrastructure, principally for extending access to water and sanitation for poor households.

It is estimated that the total capital expenditure on water and sanitation for 2012-2013 will be R8,77 billion on basic water supply projects and R4,94 billion on basic sanitation projects. The MIG allocation for water and sanitation for 2014-2015 for the Western Cape is R0.2 billion.

There is also an unconditional grant called the Equitable Share, which is provided to all municipalities to assist with operation and maintenance requirements and free basic services provision. The Equitable Share allocation for water and sanitation in 2014-2015 for the Western Cape is estimated at R 32,98 billion.

### 4.5.2 Regional Bulk Infrastructure Grant (RBIG)

The RBIG Programme was established in 2007 to support capital funding of the social component of new bulk infrastructure.

All projects must be implemented before funds are allocated. To initiate the programme, R1,4 billion was made available by National Treasury over three years. To date, a further R5,2 billion has been made available, with an additional R2,9 billion accessible from the Division of Revenue Act for 2013-2014.

The South African government adopted a National Infrastructure Plan in 2012 designed to transform our economic landscape. This plan intends to integrate and coordinate the long-term construction of infrastructure and will be coordinated by the Presidential Infrastructure Coordinating Commission (PICC).

The plan has identified 18 Strategic Integrated Projects (SIPs) which have been approved to support economic development and address service delivery in the poorest provinces.

### 4.5.3 Municipal Water Infrastructure Grant (MWIG)

The purpose of the MWIG will be to supplement other existing grants where there are gaps. The MWIG will address problems related to functionality as well as new infrastructure requirements by 30 June 2015. The total budget allocation over the next three financial years, starting from the 2013-2014 year, is R4 332 million and will be allocated annually as follows:

|           |   |                       |
|-----------|---|-----------------------|
| 2013-2014 | – | <b>R602 million</b>   |
| 2014-2015 | – | <b>R1 059 million</b> |
| 2015-2016 | – | <b>R2 671 million</b> |

#### **4.5.4 Human Settlements Development Grant (HSDG)**

This grant supports the creation of sustainable human settlements through the facilitation and provision of access to basic infrastructure, top structures and basic socio-economic amenities.

It is also intended to provide employment and skills development through infrastructure delivery. R16,9 million has been allocated for 2013-2014.

#### **4.5.6 Rural Households Infrastructure Grant (RHIG)**

This grant is managed by the Department of Human Settlements (DOHS) and was introduced in 2010-2011, after the sanitation function was transferred from the DWA to the DOHS. It is intended to supplement the existing funding of sanitation programmes by providing for the rapid rollout of on-site water and sanitation infrastructure, such as rainwater tanks and toilets for rural households whose remote location does not enable easy access piped water and sanitation services. A total of R106,7 million has been allocated for 2013-2014.

#### **4.5.6 Skills development and industry bodies in the water sector**

Generally, municipalities in South Africa suffer from an ongoing chronic shortage of engineers and a high management turnover, with 25% of management posts remaining vacant for more than three months. It is estimated that one in six managers exits the municipality during the course of a year (*Department of Water Affairs. 2013*).

Research carried out for the publication *Numbers and Needs in Local Government* (Lawless, 2005) shows that the civil engineering capacity – expressed as civil engineering professionals per 100 000 people – in local government is too low to deliver, operate and maintain local government infrastructure in a sustainable manner. For example, South Africa had 20 engineers per 100 000 people before 1994. This has now dropped to three per 100 000. Appendix 4 presents a list of courses available in South Africa.

## 5. Water Industry Bodies

The following is a list of industry associations for the water sector and some non-governmental organisations (NGOs):

**Table 1: List of industry associations operating in the water sector**

| Name   | Role & Contact Details   |
|--|--|
| Water Institute of Southern Africa (WISA)                | WISA is a forum for the exchange of information exchange to improve water resource management in Southern Africa, with a focus on South Africa. <a href="http://www.wisa.org.za/Content_page.aspx">www.wisa.org.za/Content_page.aspx</a>   |
| South African Association of Water Users (SAAWU)         | SAAWU was established in 2001 and evolved from what was previously the South African Association of Water Boards. SAAWU represents, promotes and coordinates the interests of all public sector institutions involved in providing water services. <a href="http://www.saawu.org.za/">http://www.saawu.org.za/</a> |
| Wildlife and Environment Society of South Africa (WESSA) | WESSA's mission is to implement high-impact environmental and conservation projects which promote public participation in caring for the Earth. <a href="http://www.wessa.org.za/">http://www.wessa.org.za/</a>  |
| Water and Sanitation for Africa Foundation (WSA)         | The foundation is responsible for mobilising resources to facilitate the implementation of water, sanitation and hygiene programmes to poor and unserved communities in Africa. <a href="http://www.wsafrika.org/">http://www.wsafrika.org/</a>  |
| Association for Water and Rural Development (AWARD)      | AWARD works on issues relating to water supply in South Africa's Lowveld region. <a href="http://www.award.org.za/">http://www.award.org.za/</a><br>Assistant Director: Derick du Toit, e-mail: <a href="mailto:derick@award.org.za">derick@award.org.za</a>   |

### The main databases used to access water-related data in South Africa are:

The Water Authorisation and Registration Management System (WARMS) for water use and registration (<http://www.dwaf.gov.za/Projects/WARMS/default.aspx>)

Water Services National Information System (WSNIS) website, which contains national, provincial and water service authorities (WSA) data regarding demography, basic services backlogs and progress, financial perspectives, projects and free basic services ([http://www.dwaf.gov.za/dir\\_ws/wsmenu/](http://www.dwaf.gov.za/dir_ws/wsmenu/)).

## Appendix 1: Other governmental role players in the water sector

| Acronym | Organisation  |
|---------|---|
| DWA     | <b>Department of Water Affairs</b>  |
| DEA     | <b>Department of Environmental Affairs</b><br>Ensures that environmental impact assessments for water services projects are carried out, while promoting conservation, cleaner technologies and waste minimisation.   |
| DoHS    | <b>Department of Human Settlement</b><br>Sets national housing policy aligned to local government's water services policies. DoHS is responsible for the eradication of water services backlogs in informal settlements and took over the responsibility for sanitation from DWA from 2009.   |
| DoCG    | <b>Department of Cooperative Governance</b><br>Ensures that local government provides water services, regulates municipal services partnerships, develops an integrated approach for municipal development planning, allocates funds to local government, regulates municipal affairs and intervenes in cases of non-performing WSAs in collaboration with the provincial government. |
| DRDLR   | <b>Department of Rural Development and Land Reform</b><br>Its focus is on agrarian transformation of agricultural systems and patterns of ownership and control especially in terms of irrigation schemes for small-scale farmers.  |
| DoH     | <b>Department of Health</b><br>Ensures that all hospitals and clinics are provided with adequate water and sanitation facilities.   |
| DoPW    | <b>Department of Public Works</b><br>Is responsible for implementing the community-based public works programmes and often acts as the owner and operator of public buildings, including schools and hospitals, among others.   |

## Appendix 1: Other governmental role players in the water sector

| Acronym | Organisation  |
|---------|---|
| DoE     | <b>Department of Education,</b><br>Is responsible for identifying schools that have no access to water services.  |
| DoA     | <b>Department of Agriculture</b> (provincial government)  |
| DEDT    | <b>Department of Economic Development and Tourism</b> (provincial government)   |
| DEADP   | <b>Department of Environmental Affairs and Development Planning</b> (provincial government)   |
| TCTA    | <b>Trans-Caledon Tunnel Authority,</b><br>Has various workstreams including: management services with a mandate for project implementation; financial services, with a mandate for structuring and raising project finance, debt management and tariff setting; and training, among other support services. |
| WSPs    | <b>Water service providers</b><br>Provide water and/or sanitation services for municipalities and perform contractual duties as specified by the WSA. WSP entities can be made up of public, private or mixed entities or municipal government itself.  |
| RWU     | <b>Regional water utilities or water boards.</b>  |
| SALGA   | <b>South African Local Government Association,</b><br>which an autonomous political association of municipalities that assists and guides municipalities through the implementation of water-related projects.  |

## Appendix 2: Major raw water storage dams and capabilities (Water resources – City of Cape Town)

It is important to note that the dam's capacity as presented below represents the total capacity of the infrastructure rather than a true reflection of the annual yield, which is a more accurate indication of the available water or supply and management.

| Bulk storage on 28 November 2007–2011           |             |              |             |             |             |             |
|---|-------------|--------------|-------------|-------------|-------------|-------------|
| Major Dams – 99.6% of the total system capacity | Capacity MI | % 2007       | % 2008      | % 2009      | % 2010      | % 2011      |
| Wemmershoek                                     | 58 644      | 87.3         | 93.4        | 98.3        | 92.2        | 79.2        |
| Steenbras Lower                                 | 33 517      | 95.7         | 95.3        | 95.8        | 64.9        | 79.9        |
| Steenbras Upper                                 | 31 767      | 102.1        | 99.2        | 98.1        | 98.1        | 98.2        |
| Voelwei   | 164 122     | 99.3         | 98          | 96.7        | 96.2        | 84.8        |
| Theewaterskloof                                 | 480 250     | 103.3        | 101.5       | 100.9       | 89.1        | 81.2        |
| Berg River                                      | 130 000     |              | 100.7       | 100.0       | 98.3        | 94.9        |
| <b>Total Stored</b>                             |             | 774 780      | 897 314     | 894 436     | 820 760     | 757 082     |
| <b>Total Storage</b>                            |             | 768 300      | 898 300     | 898 300     | 898 300     | 898 300     |
| <b>% Storage</b>                                |             | <b>100.8</b> | <b>99.9</b> | <b>99.6</b> | <b>91.4</b> | <b>84.3</b> |

## Appendix 3: Main DWA projects and private sector initiatives in the Western Cape

| DWA initiatives   |   |  |
|---|---|--|
|   | Description   | Custodian/developer  |
| <b>Berg River Improvement Plan (BRIP)</b>                   | The project started in September 2012 to address the current water quality concerns and their effects in and around the Berg River area. BRIP highlights the current status of sources of pollution and the various actions that municipalities and departments in the Western Cape have or are currently undertaking or planning. The project is spread over a number of short-term goals – ≤5 years – and long-term goals – 5-30 years. It identifies short- and long-term actions, and their financial implications. | <p>DWA / WGC</p> <p>A task team has been put together lead by Joy Leaner (DEA&amp;DP). There are six tasks within the BRIP. Annabel Horn is a task manager on Task 6, water pricing.</p> <p>GreenCape's water project team is carrying out a prwoject linked to the BRIP, addressing integrated water and economic planning for development in the Berg catchment.</p> <p>More information about the project is available directly from the DEA&amp;DP team (e-mail: Joy.Leaner@westerncape.gov.za; telephone: 021 483 2798)</p> |
| <b>Management and clearing of invasive alien vegetation</b> | Invasive alien species cover up to 10% of the country, and their distribution is increasing. In the Western Cape, over 170 000 hectares of land are covered by invasive alien plants, predominantly in the riparian zones. In the province, the total cost of water losses caused by invasive alien plants is estimated at R1.29 billion per year.  | <p>Working for Water (<a href="http://www.dwaf.gov.za/wfw/Control">www.dwaf.gov.za/wfw/Control</a> website), a programme set-up by the Department of Water Affairs (DWA) LandCare, a programme run through the Department of Agriculture (DoA)</p> <p>Cape Nature</p>  |
| <b>Adopt a River</b>  | The aim of this programme is to raise awareness and encourage communities to look after their water source. The programme is currently in its pilot stages in Knysna, Paarl and Grabouw in the Western Cape.  | DWA  |

## Appendix 3: Main DWA projects and private sector initiatives in the Western Cape

| Private sector initiatives                                   |   |   |
|--|---|---|
|  | Description   | Project developer   |
| <b>Bellville Waste Water Treatment Works (WWTW) upgrades</b> | <p>The R187-million Bellville WWTW will feature the largest membrane bioreactor (MBR) in the country and the facility's capacity will increase by 20 Ml/d to 70 Ml/d after the upgrades.</p> <p>With this capacity increase, the strain on the existing Bellville facility will reduce significantly and the effluent quality will improve. The plant is due for commissioning in 2013.</p>   | The City of Cape Town's Department of Water and Sanitation is the client. It appointed Veolia Water Solutions & Technologies South Africa |
| <b>Construction of Berg River Dam</b>                        | <p>The capacity of the dam will be increased by 523 million cubic meters a year. The dam construction team moved some 3 100 000m<sup>3</sup> of earth, most of which formed part of the 900m long, 60m high and 200m wide earth-fill embankment. Aveng Grinaker-LTA also carried out the drilling and grouting for the project Project location: Franschhoek, Western Cape, South Africa.</p> | The Trans Caledon Tunnel Authority appointed Aveng Grinaker-LTA   |
| <b>Meulwater WWTW</b>  | <p>The new facility will treat water from the Nantes and Bethel bulk storage dams on Paarl Mountain, and the plant will be located on the boundary of the Paarl Mountain Nature Reserve.</p>  | Aurecon   |
| <b>Malmesbury WWTW</b>                                       | <p>The existing WWTW is being upgraded to a 10 Ml per day MBR plant.</p>  | Aurecon   |

### Appendix 3: Main DWA projects and private sector initiatives in the Western Cape

| Private sector initiatives                         |  |                                |
|--|--|--------------------------------|
|  | Description  | Project developer              |
| <b>Citrusdal WWTW upgrades</b>                     | Involves relocating WWTW and upgrading the capacity; an additional 3Mℓ reservoir; upgrading the water and sewer network, pump stations and rising mains.   | Water & Wastewater Engineering |
| <b>Plettenberg Bay WWTW</b>                        | Plettenberg Bay Water Treatment Works in the Southern Cape featuring the Department of Agriculture, Forestry and Fisheries (DAFF) and ozone technologies.  | Royal HaskoningDHV             |
| <b>Wemmershoek WWTW</b>                            | This R70-million project involves the construction of an upgraded five-million litre-a-day sewage treatment works, a new main transfer sewer pipeline from Franschhoek to Wemmershoek and an outfall pipeline to the Berg River.               | Royal HaskoningDHV             |
| <b>Water Efficiency Programme – Leak Detection</b> | Senior Secondary High School Motherwell – Pilot Project  | Aqua Trip                      |
| <b>Natural Water Treatment projects</b>            | <p>A five-year project on biomimicry for water treatment supported by the Water Research Commission.</p> <p>The Naturally Knysna and Discovery Challenge Park projects.</p> <p>The Genius of Place projects, starting in the Western Cape.</p> | Biomimicry                     |

## Appendix 4: Institutions providing water training courses

### The Energy and Water Sector Education and Training Authority (EWSETA)

is one of 23 Sector Education and Training Authorities (SETAs) established in South Africa in terms of the Skills Development Act of 1998.

EWSETA monitors and accredits the training courses listed below

| Institution  | Training course/project description  |
|--|--|
| <b>FETWater</b>  | A programme launched by UNESCO that supports training and capacity building networks in integrated water resource management in the water sector in South Africa.  |
| <b>Water Institute of Southern Africa (WISA)</b>                       | Professional Process Controller Training National Qualification Framework (NQF).   |
| <b>Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)</b>   | GIZ, WISA and the Western Cape Process Controllers Division are developing a Water and Wastewater Process Controller Programme.  |
| <b>The Water Academy</b>   | An accredited water service sector and training provider for vocational training for water and wastewater treatment process controllers as well as water and wastewater reticulation and distribution servicemen. National Technical Certificate: Engineering Studies (NI-N3) and Plumbing (Duration: 1 year).   |
| <b>Continuing Education at University of Pretoria Trust (CE at UP)</b> | Accredited provider of more than 500 short certificate courses across 20 industry fields.  |
| <b>Terra Firma Academy</b>   | Green career training.   |
| <b>Terotechica Maintenance College</b>                                 | Water treatment plant and maintenance courses.   |
| <b>Water &amp; Wastewater Engineering</b>                              | Pierre Marais, Managing Director, Water & Wastewater Engineering, presented to the final year civil engineering students at the University of Stellenbosch. In conjunction with the university, the company hosted a bi-annual course on water and wastewater treatment, which contributed to continued professional development points for engineers as prescribed by the Engineering Council of South Africa (ECSA). |
| <b>Cape Peninsula University of Technology (CPUT)</b>                  | Professor Alvin Lagardien put together a course for process controllers. This is still to be confirmed.  |
| <b>biomimicrySA</b>  | biomimicrySA's Learning Journey projects involve individuals and teams working to grow the capacity of biomimicry practitioners in a variety of fields including waste management and wastewater treatment.  |