

2019/20 SOUTH AFRICA YEARBOOK

Human Settlements, Water and Sanitation



Human Settlements, Water and Sanitation

The Department of Human Settlements (DHS) and the Department of Water and Sanitation (DWS) report to the Minister of Human Settlements, Water and Sanitation.

Human Settlements

The DHS derives its core mandate and responsibilities from Section 26 of the Constitution of the Republic of South Africa, 1996 and Section 3 of the Housing Act, 1997 (Act 107 of 1997). This allows the department, in collaboration with provinces and municipalities, to establish and facilitate a sustainable process for the development of housing. The DHS does this by determining national policy and national norms and standards for the development of housing and human settlements, setting broad national goals for the delivery of housing, providing funding to provinces and metropolitan municipalities, and monitoring the financial and non-financial performance of provinces and municipalities against these goals. In executing these roles and responsibilities, the department also builds capacity for provinces and municipalities, and promotes consultation with all stakeholders in the housing delivery chain, including other sector departments, civil society and the private sector.

The National Development Plan (NDP) expresses the need for a systematic response to South Africa's entrenched spatial patterns that exacerbate social inequality and economic inefficiency. Priority 4 (spatial integration, human settlements and local government) of government's 2019 – 2024 Medium Term Strategic Framework (MTSF) is aimed at addressing this need. To give effect to these guiding policies, the DHS will focus on four priority areas over the medium term: facilitating the development of integrated human settlements, upgrading informal settlements, providing affordable rental housing and providing affordable housing finance.

Integrated human settlements

The development of integrated human settlements is aimed at transforming spatial housing patterns in South Africa by creating more inclusive, denser, mixed-use urban areas, while striving for a more functional housing market that adequately responds to both supply and demand for all levels of affordability and

need. The department is reviewing housing legislation and related policies to transition from a narrow focus on housing alone to a more holistic view of human settlements.

Integrated housing developments are funded mainly through the Urban Settlements Development Grant and the Human Settlements Development Grant. To deliver mixed-use, mixed-income and integrated settlements, the department, through housing and infrastructure subsidies delivered through provinces, municipalities and public entities such as the Housing Development Agency (HDA), is expected to spend R71.9 billion over the Medium Term Expenditure Framework (MTEF) period. Of this amount, an estimated R23.7 billion is allocated to metropolitan cities for bulk and related infrastructure through the Urban Settlements Development Grant, whereas provinces are allocated an estimated R41.5 billion for housing and related infrastructure through the Human Settlements Development Grant.

Upgrading informal settlements

According to Statistics South Africa's 2018 General Household Survey (published in May 2019), 14% (2.3 million) of South African households are in informal settlements. The DHS's plan to upgrade informal settlements is intended to provide security of tenure and basic services to poor and underserved households, with the prospect of state assisted housing structures for those who meet the qualifying criteria.

The sector will rely on participation from communities and community-based organisations to inform the planning and design of informal settlements as it implements the upgrades. This will enable households to invest in their communities, especially those that do not qualify for full housing subsidies. An estimated R22.6 billion will be spent on the upgrading of informal settlements over the next three years. Of this amount, R2.3 billion is set to be spent in cities through a component in the Urban Settlements Development Grant in 2020/21; R2.4 billion in provinces through a component in the Human Settlements Development Grant in 2020/21; and R16.1 billion in cities and provinces through the new Informal Settlements Upgrading Partnership Grant in 2021/22 and 2022/23.

Affordable rental housing

The DHS is committed to providing rental and social housing to support the affordable housing market, which requires flexibility in tenure in a dynamic and changing economic environment. To support this objective, spending in the Rental and Social Housing programme is expected to increase from R850.8 million in 2019/20 to R971.1 million in 2022/23 at an average annual rate of 4.5%.

To accelerate the delivery of well-located, affordable rental and social housing, the DHS plans to provide capital subsidies to accredited social housing institutions through the Social Housing Regulatory Authority (SHRA) to lower the cost of construction for developers and the cost of occupation for tenants. The authority is expected to provide R2.3 billion in subsidies over the medium term.

Affordable housing finance

The provision of affordable housing is an important aspect of supporting the housing market. As household incomes have increased over time, many people have found themselves in a position where they earn too much to qualify for a full housing subsidy, but too little to qualify for a mortgage loan that matches income-related housing supply. The DHS is working to enhance affordable housing finance programmes to assist this growing segment by providing lump-sum deposits to qualifying beneficiaries to lower their monthly mortgage repayments. Funding for this priority area is in the Affordable Housing programme, in which spending is expected to increase from R233.6 million in 2019/20 to R633.4 million in 2022/23 at an average annual rate of 39.4%. This increase is largely driven by additional allocations of R1.3 billion over the MTEF period for the National Housing Finance Corporation's (NHFC) Finance-Linked Individual Subsidy Programme (FLISP).

Legislation and policy

The mandate of the DHS is derived from the following legislative framework:

- the Housing Act of 1997, which provides for the facilitation of a sustainable housing development process, and further lays down general principles applicable to housing development

in all spheres of government, including defining the functions of national, provincial and local governments in respect of housing development;

- the Estate Agency Affairs Board Act, 1976 (Act 112 of 1976), which provides for the establishment of an Estate Agency Affairs Board and an Estate Agents Fidelity Fund, including the control of certain activities of estate agents in the public interest;
- the Social Housing Act, 2008 (Act 16 of 2008), which provides for the establishment of the SHRA, as regulator of all social housing institutions, and further defines the functions of national, provincial and local governments in respect of social housing;
- the Prevention of Illegal Eviction and Unlawful Occupation of Land Act, 1998 (Act 19 of 1998), as amended, which provides for the prohibition of unlawful eviction and further provides procedures for the eviction of unlawful occupiers, including the repeal of the Prevention of Illegal Squatting Act, 1951 (Act 52 of 1951);
- the Housing Consumers Protection Measures Act, 1998 (Act 95 of 1998), which makes provision for the protection of housing consumers and also provides for the establishment and functions of the National Home Builders Registration Council (NHBRC);
- the Rental Housing Act, 1999 (Act 50 of 1999), which provides clear roles and responsibilities of government in respect of rental housing property and also makes a provision for promoting access to adequate housing through creating mechanisms for ensuring the proper functioning of the rental housing market;
- the Public Finance Management Act (PFMA), 1999 (Act 1 of 1999), as amended, which secures transparency, accountability, and sound management of the revenue, expenditure, assets and liabilities of the institutions to which it applies. The Act regulates financial management in the national government and provincial spheres of governments. It also assists in ensuring that all revenue, expenditure, assets as well as liabilities of those two spheres of governments are managed efficiently and effectively. The Act further provides for the responsibilities of persons

entrusted with financial management in those two spheres of governments;

- the Home Loan and Mortgage Disclosure Act, 2000 (Act 63 of 2000), which promotes the practice of fair lending by requiring disclosure by financial institutions of information regarding the provision of home loans. It also serves to establish an Office of Disclosure. The Act requires lenders to compile and disclose annual data on the demographic makeup and geographic distribution of housing-related loans;
- the Intergovernmental Relations Framework Act, 2005 (Act 13 of 2005), which serves to establish a framework for the three spheres of government to promote and facilitate intergovernmental relations among them. The Act also provides for mechanisms and procedures in order to facilitate the settlement of intergovernmental disputes among spheres of government.;
- the HDA Act, 2008 (Act 23 of 2008), which serves to establish the agency and to provide for its functions and powers. It also outlines the roles of the agency, which is to facilitate the acquisition of land and landed property, in a way that complements the capacities of government across all spheres, and to fast-track land acquisition and housing development services for the purpose of creating sustainable human settlements;
- the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013), which provides a framework for spatial planning and land use management in South Africa. It specifies the relationship between the spatial planning and the land use management system and other kinds of planning. It also ensures that the system of spatial planning and land use management promoted social and economic inclusion;
- the Community Scheme Ombud Service Act, 2011 (Act 9 of 2011), which serves to provide for the establishment of the Community Schemes Ombud Service and to provide for its mandate and functions. The Act also provides for a dispute resolution mechanism in community schemes;
- the Broad-based Black Economic Empowerment Act, 2003 (Act 53 of 2003), which establishes a legislative framework

for the promotion of black economic empowerment and empowers the relevant Minister to issue codes of good practice and to publish transformation charters for key sectors. The Act further establishes the Black Economic Empowerment Advisory Council;

- the Expropriation Act, 1975 (Act 63 of 1975), which serves to provide for the expropriation of land and other property for public and certain other purposes;
- the Development Facilitation Act, 1995 (Act 67 of 1995), which facilitates and speeds up the implementation of the Reconstruction and Development Programme and projects;
- the Less Formal Township Establishment Act, 1991 (Act 113 of 1991), as amended, which provides for shortened procedures for the designation, provision and development of land and for the establishment of township for less formal forms of residential settlement;
- the National Environment Management Act (NEMA), 1998 (Act 107 of 1998), as amended, which protects ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas. The Act places a responsibility to the department to adhere to the sustainable development and conservation principles;
- the Sectional Titles Management Act, 2011 (Act 8 of 2011), which provides for the establishment of body corporates to manage and regulate sections and common property in sectional titles schemes and for that purpose to apply rules applicable to such schemes. It further requires the body corporates to establish a sectional titles schemes management advisory council; and
- the Division of Revenue Act, 2018 (Act 14 of 2018), as amended, which provides for the equitable division of revenue raised nationally among the national, provincial and local spheres of government for various financial years. It also makes a determination of each province's equitable share and allocations to provinces, local government and municipalities from national government's equitable share and the responsibilities of all three spheres pursuant to such division and allocations.

Budget

For the 2019/20 financial year, the DHS was allocated R33.9 billion. As a result of Cabinet-approved budget reductions of R14.6 billion over the MTEF period, the department's allocation is set to decrease at an average annual rate of 1.1%, from R33.9 billion in 2019/20 to R32.8 billion in 2022/23. These reductions are largely affected on conditional grants to provinces and metropolitan cities for the development of housing and related infrastructure due to government's broad imperative to reduce public spending.

Entity

National Housing Finance Corporation

The NHFC was established in 1996 as a Schedule 3A development finance institution. Its principal mandate is to broaden and deepen access to affordable housing finance for low-income to middle-income households by facilitating private-sector lending for housing. Over the medium term, the corporation will focus on providing incremental housing finance, mainly for rural housing; developer and emerging contractor finance; affordable rental housing finance; and finance-linked individual subsidies to qualifying households. Funding will be delivered through non-banking financial institutions and other retail intermediaries. It is expected that, over the medium term, a human settlements development bank, which will assume this function, will be formally established. The corporation derives its revenue mainly through interest on loans; interest and dividends on investments; rental income; and transfers from the DHS for the FLISP, which account for an average of 43.4% (R1.4 billion) of total revenue over the MTEF period and include an operational allocation. Expenditure is expected to increase from R475.6 million in 2019/20 to R918.8 million in 2022/23 at an average annual rate of 24.5%, largely driven by the significant increase in the funding for the FLISP.

Other entities

Community Schemes Ombud Service

The Community Schemes Ombud Service provides a dispute resolution service for community schemes, monitors and controls the quality of all documentation for sectional title

scheme governance, and takes custody of, preserves and provides public access to scheme governance documentation. The entity's total budget for 2019/20 was R267.8 million.

Estate Agency Affairs Board

The board regulates, maintains and promotes the conduct of estate agents. The board is also responsible for managing and controlling the Estate Agents Fidelity Fund, issuing Estate Agents Fidelity Fund certificates, prescribing the standard of education and training for estate agents, and investigating complaints lodged against estate agents. The board's total budget for 2019/20 was R162.2 million.

Housing Development Agency

The agency identifies, acquires, holds, develops and releases state-owned and privately-owned land for residential and community purposes. The HDA is also responsible for managing housing development projects for the creation of sustainable human settlements. The agency's total budget for 2019/20 was R443.3 million.

National Home Builders Registration Council

The NHBRC protects and represents the interests of housing consumers by providing warranty protection against defined defects in new homes and regulates the homebuilding industry. The council also provides training and capacity building to promote and ensure compliance with technical standards in the home-building environment.

Social Housing Regulatory Authority

The authority regulates the social housing sector to ensure a sustainable flow of investment into accredited social housing projects in restructuring zones. The regulator's total budget for 2019/20 was R815.9 million.

Programmes and funding

Finance-Linked Individual Subsidy Programme

The Constitution enshrines the right of everyone to have access to adequate housing and makes it incumbent upon government to take reasonable measures to achieve this.

Among government's many programmes, the FLISP is specifically intended for the market segment whose income is inadequate to qualify for a home loan but exceeds the maximum limit applicable to access government's "free basic house" subsidy scheme. This market segment, generally known as the "affordable/gap" market, earns between R3 501 and R15 000 per month.

Households in this segment, if buying a home for the first time, may apply for a FLISP subsidy.

The subsidy attaches to the beneficiary and not to the property. This is used to decrease the mortgage bond and applies only to people who have never been assisted by government. It is disbursed as a once-off subsidy.

Rental and Social Housing

Social housing provides medium density rental housing to low income households. The programme promotes the provision of affordable rental housing, monitors the performance of the SHRA, and develops capabilities in the rental housing sector through intergovernmental collaboration and evidence-based research. Over the medium term, work under the programme will include promoting the delivery of affordable rental housing by conducting research, and developing policies and programmes as and when required, strengthening cooperation and collaboration by facilitating intergovernmental forums and stakeholder partnerships on an ongoing basis, and accelerate the provision of affordable rental housing by providing capital and operational funding to the SHRA to deliver 18 000 social housing units and monitoring and evaluating the financial and non-financial performance of affordable rental housing programmes and projects on a monthly and quarterly basis.

Integrated Human Settlements Planning and Development

The programme manages the development of policy, planning and research in the creation of sustainable and integrated human settlements, oversees the delivery of the Integrated Residential Development Programme, and coordinates intergovernmental partnerships with stakeholders. Over the medium term, work under the programme will include accelerating the delivery

of spatially integrated housing and human settlements development by transferring and monitoring the Human Settlements Development Grant and Title Deeds Restoration Grant to provinces, and the Urban Settlements Development Grant to metropolitan municipalities and undertaking research and developing housing and human settlements policies and programmes. It will also promote planning coordination and strengthen intergovernmental cooperation across and within different spheres of government by providing support to provinces and municipalities in the development of 57 integrated implementation plans over the medium term and facilitating intergovernmental forums and stakeholder partnerships on an ongoing basis.

Informal Settlements

The programme provides policy, planning and capacity support for the upgrading of informal settlements, and oversees the implementation of the Informal Settlements Upgrading Programme. Over the medium term, work under the programme will include accelerating the provision of security of tenure, basic services and related infrastructure by managing the transfer of the Informal Settlements Upgrading Partnership Grant to municipalities and provinces, undertaking evidence-based research and developing responsive policies and supporting provinces and municipalities through the National Upgrading Support Programme.

Affordable Housing

The programme facilitates the provision of affordable housing finance, monitors market trends, and develops research and policy that respond to demand. It also oversees housing finance entities reporting to the Minister of Human Settlements, Water and Sanitation. Over the medium term, work under the programme will include strengthening cooperation and collaboration by facilitating intergovernmental forums and stakeholder partnerships. It will also accelerate the provision of affordable housing finance by providing capital and operational funding to the NHFC for the administration of the FLISP, researching and developing policies and programmes that promote the provision of affordable housing finance for

households as and when required and monitor and evaluate the financial and non-financial performance of affordable housing programmes and projects.

Housing subsidies

A housing subsidy is a grant given by government to qualifying beneficiaries to be used for housing purposes. The subsidy is either paid to a seller of a house or, in new developments, it is used to finance the construction of a house that complies with the ministerial minimum norms and standards. The house is then transferred to the qualifying beneficiary.

One of the DHS's areas of responsibility in the delivery of human settlements relates to the bottom-most end of the market, where it provides housing subsidies to the poor.

This is where the bulk of the housing backlog exists, affecting mainly those who earn below R3 500 a month.

Individual subsidies

An individual subsidy provides qualifying beneficiaries with access to housing subsidies to acquire ownership of improved residential properties (a stand or house) or to finance the acquisition of a serviced site linked to a house-building contract that is not part of an approved housing-subsidy project.

The latter option is only available to beneficiaries with access to housing credit. The subsidy amount of R84 000 comprises R6 000 for the raw land cost, R22 162 for internal municipal engineering services and R55 706 for the cost of constructing the top structure.

Consolidation subsidies

This subsidy mechanism gives former beneficiaries of serviced stands, financed by the previous housing dispensation (including the Independent Development Trust's site and service schemes), the opportunity to acquire houses.

Housing Development Finance Programme

The grant funds the delivery of housing and human settlements programmes, and manages all matters related to improving access to housing finance and developing partnerships with the financial sector. Its objectives are to:

- manage the performance of provinces and municipalities by monitoring the expenditure and non-financial performance of human settlements development and housing programmes on a monthly and quarterly basis;
- accelerate the delivery of housing and human settlements by providing funding from the Human Settlements Development Grant, the Urban Settlements Development Grant and transfers to public entities on a scheduled ongoing basis;
- improve access to housing finance by collaborating with the private sector and related entities to develop mechanisms to increase market penetration and provide loans to low and middle income households on an ongoing basis; and
- ensure equal access to housing finance through monitoring the lending practices of the financial sector by publishing an annual report on mortgage finance.

Institutional subsidies

Institutional subsidies are available to qualifying housing institutions. The subsidy is paid to approved institutions to provide subsidised housing on deed of sale, rental or rent-to-buy options.

This is done on condition that the beneficiaries may not be compelled to pay the full purchase price and take transfer within the first four years of receiving the subsidy. Institutions must also invest capital from their own resources in the project.

Subsidies for people with disabilities

People with disabilities who qualify for a housing subsidy receive additional amounts to improve their houses with special additions such as paving and ramps to their doors, grab rails in bathrooms, and visible doorbells for the deaf.

Enhanced Extended Discount Benefit Scheme

The scheme promotes home ownership among tenants of state-financed rental stock, including formal housing and serviced sites. The scheme is only available to beneficiaries who took occupation of such rented houses before 15 March 1991.

Rural subsidies

These housing subsidies are available to beneficiaries who enjoy only functional tenure rights to the land they occupy.

This land belongs to the State and is governed by traditional authorities.

These subsidies are only available on a project basis and beneficiaries are supported by implementing agents. Beneficiaries also have the right to decide how to use their subsidies, either for service provision, for the building of houses, or for a combination of these.

Farm resident subsidies

The Housing Subsidy Programme for Farm Residents addresses the wide variety of housing needs of people working and residing on farms by providing a flexible package of housing models to suit the local context.

In most instances, the programme is applied where farm residents are required to reside close to their employment obligations and where the farm land is distant from the nearest town, rendering the settlement of the farm residents in town impracticable.

Farm residents play an important role in all aspects of their housing solutions regarding the selection of options, the design and implementation phase, as well as the ongoing management of the housing stock.

In May 2020, the Minister of Human Settlements, Water and Sanitation announced 136 priority human settlements and housing development areas (PHSHDAs) across the country. The initiative is aimed at ensuring redress regarding the pre-1994 spatial plan, revitalising towns and cities and strengthening the livelihoods of households. It will enable residents to live closer to areas with economic activities and social amenities such as schools, health facilities and job opportunities while accessing adequate accommodation.

The initiative will be implemented in line with the national housing programmes namely, the Enhanced People's Housing Process, the Informal Settlements Upgrading, the Integrated Residential Development Programme and the Social Housing Programme.

The PHSHDAs will cover the entire country as follows:

- KwaZulu-Natal: 22
- Western Cape: 19
- Mpumalanga: 16
- North West: 14
- Eastern Cape: 12
- Limpopo: 11
- Free State: 10
- Northern Cape: 6

Human Settlements Development Grant

The grant reflects the conditional allocation transferred to all provinces for the delivery of housing projects, as per the National Housing Code.

Rural Housing Loan Fund

The Rural Housing Loan Fund is a wholesale lending institution. It is mandated to facilitate access to housing credit to low-income rural households by providing wholesale finance through a network of retail intermediaries and community-based organisations.

International relations

South Africa is party to the United Nations (UN) Millennium Development Goals, which provide for the significant improvement in the lives of at least 100 million slum dwellers by 2020. In addition to these conventions, South Africa adheres to the following declarations under the UN Habitat Programme:

- the Vancouver Declaration on Human Settlements of 1976; and
- the Istanbul Declaration on Cities and other Human Settlements of 1996 and the Habitat Agenda of 1996, the focus of which is to address the plight of people without adequate housing.

World Urban Forum (WUF)

The WUF was established by the UN to ensure that member states and the world responds to ensure proper and sustainable management of urbanisation in towns and cities across the globe. The matters which receive attention include eradicating the ill effects of urbanisation such as poverty, unemployment, inequality, and managing the negative consequences of climate change on communities.

It brings together government leaders, Ministers, mayors, diplomats, members of national, regional and local government, non-governmental and community organisations, professionals, academics, grassroots leadership of women and youth to debate and propose solutions to ensure proper, working, equitable and sustainable livelihoods for households and people living in urban areas.

The forum also advises the Executive Director of the UN-Habitat, and the UN-Habitat's Governing Council on key issues that should inform the work of UN Habitat and all key stakeholders in the field of human settlements and urban development.

The 10th session of the WUF was held from 8 – 13 February 2020 in Abu Dhabi, United Arab Emirates; the first time that an Arab country hosted the world's most important conference on cities and human settlements.

The event was convened by UN-Habitat in partnership with the Abu Dhabi Department of Urban Planning and Municipalities, the Abu Dhabi Department of Culture and Tourism, Ministry of Foreign Affairs and International Cooperation, General Secretariat of the Executive Council, and the Abu Dhabi National Exhibition Centre. It was held under the theme, "Cities of Opportunities: Connecting Culture and Innovation".

Water and Sanitation

The DWS legislative mandate seeks to ensure that the country's water resources are protected, managed, used, developed, conserved and controlled by regulating and supporting the delivery of effective water supply and sanitation. This is done in accordance with the requirements of water-related policies and legislation that are critical in delivering on people's right to have sufficient food and water, growing the economy, and eradicating poverty.

Chapter 4 of the NDP envisages a South Africa that recognises the importance of secure and equitable access to water and sanitation as catalysts for socio-economic development. This is given expression by Priority 1 (economic transformation and job creation) and Priority 4 (spatial integration, human settlements and local government) of government's 2019 – 2024 MTSP, with which the work of the DWS is aligned. Accordingly, the department will continue to focus on integrated water resources management, infrastructure planning, and developing and regulating water services.

Water resources management, infrastructure planning and development

The Water and Sanitation Master Plan details the requirements for appropriate investment into water resources and services,

and sets targets for adequate water conservation and demand management. To support the implementation of the master plan, the Water Infrastructure Development Programme is expected to receive allocations amounting to R41.6 billion over the MTEF period. These allocations will provide funding to the Regional Bulk Infrastructure Grant, the Water Services Infrastructure Grant and transfers to the Water Trading Entity for the development of key water infrastructure. Funding in these grants for new and existing projects amount to R33.2 billion over the medium term. Funding from these grants will be used to implement two mega projects and 26 large regional bulk infrastructure projects. Over the medium term, 280 small regional bulk and water services infrastructure projects will be implemented.

To address water infrastructure backlogs and improve operational sustainability, over the medium term, the DHS will continue to plan and maintain infrastructure. Related activities will be carried out in the Water Planning and Information Management programme, which is expected to increase at an average annual rate of 7.6%, from R907.9 million in 2019/20 to R1.1 billion in 2022/23. To continue funding short-term and long-term interventions in new and existing projects, the Water Trading Entity will receive transfers amounting to R7.2 billion over the medium term. Projects include acid mine drainage operations in Gauteng, phase 2D of the Olifants River Water Resources Development Project, the Mokolo-Crocodile River Water Augmentation Project, the raising of Tzaneen Dam, the Umdloti River Development Project, and the raising of the Hazelmere Dam.

Regulating water services

Over the period ahead, the DWS plans to reintroduce regulatory quality valuations on the provision of water services. These valuations are intended to measure the level of compliance with the green drop and blue drop standards. Accordingly, the department plans to assess 963 wastewater in 2020/21 and 1 010 water supply systems in 2021/22. To improve equitable access to water resources, the department plans to process 80% of the water use licence applications it receives within 120 days. In addition, the department plans to assess and determine the

resource quality of the uThukela River system. These activities will be carried out in the Water Sector Regulation programme, which is expected to receive allocations amounting to R1.3 billion over the medium term.

Legislation

The Constitution enshrines the basic human right to have access to sufficient water, as well as a safe and healthy environment. The government fulfils these rights through the DWS, assisted by specific legislation:

- the National Water Act, 1998 (Act 36 of 1998), which ensures that South Africa's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all people;
- the Water Services Act, 1997 (Act 108 of 1997), which prescribes the legislative duty of municipalities as water-service authorities to provide water supply and sanitation according to national standards and norms. It also regulates water boards as important water service providers and gives the executive authority and responsibility to the Minister of Human Settlements, Water and Sanitation to support and strengthen the capacity of municipalities to manage their own affairs, exercise their powers and perform their functions;
- the Water Research Act, 1971 (Act 34 of 1971), which provides for the promotion of water-related research through a Water Research Commission (WRC) and a Water Research Fund; and
- the NEMA of 1998, which makes provision for cooperative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that promote cooperative governance and procedures for coordinating environmental functions exercised by organs of state.

Budget

The DWS was allocated R16.5 billion for the 2019/20 financial year.

Expenditure is expected to increase at an average annual rate of 2.9%, from R16.5 billion in 2019/20 to R17.9 billion in 2022/23. Transfers and subsidies, and payments for capital

assets account for 78.2% (R40.9 billion) of the department's total expenditure over the MTEF period. The bulk of the department's remaining expenditure over the same period is on compensation of employees, which amounts to R6.3 billion; and goods and services, which amounts to R5.2 billion.

Spending in the Water Infrastructure Development programme accounts for 79.7% (R41.6 billion) of the DWS's total expenditure over the medium term. This is despite Cabinet having approved reductions amounting to R2.2 billion over the same period on the Regional Bulk Infrastructure Grant and the Water Services Infrastructure Grant, which are funded through the programme. As a result of these reductions, direct transfers to municipalities are expected to increase at an average annual rate of 1.4%, from R5.7 billion in 2019/20 to R6 billion in 2022/23.

Entities

Consolidated water boards

Water boards derive their mandates from the Water Services Act of 1997 and are listed under Schedule 3B in the PFMA of 1999. There are nine water boards, which are primarily mandated to provide bulk industrial and potable water services to municipalities and industries within their gazetted areas of operation. The water boards vary in size, activities, customer mix, revenue base and capacity. Rand Water and Umgeni Water, which are discussed separately, operate largely in urban areas, while others operate in rural areas. In addition to responding to their core mandate, some water boards provide retail water and sanitation services on behalf of municipalities as secondary activities.

Consolidated expenditure is expected to increase at an average annual rate of 9.9%, from R21.7 billion in 2019/20 to R28.8 billion in 2022/23. This is mainly due to increases in the purchase of raw water, and costs related to energy, pumping and chemicals. Accordingly, spending on bulk water activities is expected to increase at an average annual rate of 11.3%, from R15.7 billion in 2019/20 to R21.7 billion in 2022/23. The water boards' capital expenditure is expected to increase at an average annual rate of 12.5%, from R7.2 billion in 2019/20 to R10.2 billion in 2022/23. Revenue, which is expected to amount to R98.1 billion over the MTEF period, is generated from the sale of bulk water and other sources such as interest, dividends and rent on land.

Rand Water

Rand Water was established in terms of the Water Services Act of 1997 and is categorised as a national government business enterprise in terms of Schedule 3B of the PFMA of 1999. The water board serves approximately 19 million people, with the Vaal River system supplying 98% of its bulk water. Rand Water stores, treats and delivers potable water to municipalities, mines and industries in and around Gauteng.

Over the medium term, the water board will continue to focus on its primary bulk water activities at an estimated cost of R39.7 billion, accounting for 79.5% of its total expenditure. Spending on bulk water activities is expected to increase at an average annual rate of 12.9%, from R10.3 billion in 2019/20 to R14.8 billion in 2022/23. Accordingly, spending on goods and services is expected to increase at an average annual rate of 11.3%, from R10.7 billion in 2019/20 to R14.7 billion in 2022/23; and spending on compensation of employees is expected to increase at an average annual rate of 7.9%, from R2 billion in 2019/20 to R2.6 billion in 2022/23. This is in line with the water board's expected increase in personnel by 32 over the period ahead to assist with its planned expansion of service coverage.

Spending on capital assets is expected to increase at an annual average rate of 20.1%, from R3.7 billion in 2019/20 to R6.3 billion in 2022/23, mainly driven by spending on Zuikerbosch Pumping Station 5. Over the same period, the water board will also implement the Sedibeng Regional Sewer Scheme, which includes upgrading the Leeuwkuil and Meyerton wastewater treatment plants, at an estimated cost of R5.5 billion.

Bulk water sales constitute 98.3% (R61.7 billion) of total revenue over the medium term, increasing at an average annual rate of 10.4%, from R16.9 billion in 2019/20 to R22.7 billion in 2022/23.

The increase in revenue is driven by the volume of water sold, which is expected to increase to 1 770 345 megalitres by 2022/23, with tariffs expected to increase to R13.07 per kilolitre by 2022/23.

Trans-Caledon Tunnel Authority (TCTA)

The TCTA was established in 1986 as a specialised liability management entity. It is responsible for financing and implementing the development of bulk raw water infrastructure and providing treasury management services to the DWS. The authority plays an important role in providing financial advisory services such as structuring and raising project finance, managing debt and setting tariffs; project implementation services; and other technical support to the department and water boards. As such, the authority will continue with the planning and implementation of the Vaal River system through phase 2 of the Lesotho Highlands Water Project (LHWP), providing a short-term solution to acid mine drainage in Gauteng, and phase 2A of the Mokolo-Crocodile River Water Augmentation Project.

The authority's main cost driver is the Mokolo-Crocodile River Water Augmentation Project, spending on which is expected to increase at an average annual rate of 102.7%, from R396.3 million in 2019/20 to R3.3 billion in 2022/23, due to the escalation of construction activities. The project comprises the construction of a 160-kilometre (km) pipeline and pump station transferring water from the existing Mokolo-Crocodile Dam to supply water to the Lephalale Municipality, Exxaro's Grootegeluk coal mine, and Eskom's Matimba and Medupi power stations.

The authority's overall debt is expected to increase at an average annual rate of 11.4%, from R28.1 billion in 2019/20 to R38.9 billion in 2023/23. Revenue is generated by tariffs received from completed projects, as well as the subsequent management of debt incurred for the implementation of these. The TCTA's total revenue is expected to be R13.6 billion over the MTEF period.

Umgeni Water

Umgeni Water was established in terms of the Water Services Act of 1997 to provide water and sanitation services in its service area, which comprises mostly rural areas in KwaZulu-Natal and the eThekweni metropolitan area. The water board supplies water to approximately six million consumers. Its ongoing objective is to support socio-economic development through water infrastructure investment in its area of

operation. Accordingly, over the medium term, the water board will construct phase 1 of the Greater Mpofana Regional Water Scheme, the Impendle Bulk Water Supply Scheme, and phase 3 of the Maphumulo Bulk Water Supply Scheme, targeting largely indigent municipal areas. In addition, to ensure water security, the water board will target augmentation, upgrades and the rehabilitation of projects such as the Lower Umkhomazi Bulk Water Supply Scheme and phase 1 of the Umkhomazi Water Project. As a result, capital expenditure is expected to increase at an average annual rate of 17.4%, from R1.5 billion in 2019/20 to R2.4 billion in 2022/23.

Total expenditure is expected to increase at an average annual rate of 8.5%, from R3.1 billion in 2019/20 to R4 billion in 2022/23. Spending on bulk water activities amounts to R5.8 billion over the medium term, largely driven by goods and services for the purification and transportation of bulk water. Revenue from the sale of bulk water is expected to increase at an average annual rate of 11.3%, from R4.2 billion in 2019/20 to R5.8 billion in 2022/23. The water board's revenue is mainly generated by the sale of bulk water to customers.

The Water Trading Entity

The Water Trading Entity was established in 1983 for the management of water infrastructure and resources, and the sale of raw water. It was converted into a trading entity in terms of the PFMA of 1999 in 2008. Over the medium term, the entity will continue to focus on maintaining existing water resource infrastructure, supporting the long-term sustainability of water resources, and supplying bulk water to strategic users such as large industrial companies to stimulate and support economic development. Accordingly, over the medium term, the entity anticipates the completion of three raw water projects (Tzaneen Dam, Clanwilliam Dam and Hazelmere Dam). Spending on these projects is expected to increase at an average annual rate of 8.7%, from R12.8 billion in 2019/20 to R16.4 billion in 2022/23. Capital expenditure is expected to increase at an average annual rate of 10.5%, from R1.6 billion in 2019/20 to R2.2 billion in 2022/23.

Revenue is expected to increase at an average annual rate of 9.6%, from R14.7 billion in 2019/20 to R19.3 billion in 2022/23.

Revenue from the sale of raw water is expected to increase at an average annual rate of 10.7%, from R11.9 billion in 2019/20 to R16.1 billion in 2022/23. Revenue derived from transfers from the DWS amounts to R7.2 billion over the medium term. These funds will be used to finance the TCTA's construction of raw water infrastructure.

Other entities

Breede-Gouritz Catchment Management Agency

The agency plays a key role in the use, protection and development of water resources in the Breede-Gouritz water catchment area. The agency's total budget for 2019/20 was R67.5 million.

Inkomati-Usuthu Catchment Management Agency

The Inkomati-Usuthu Catchment Management Agency plays a key role in the use, protection and development of water resources in the Inkomati-Usuthu water catchment area. Its total budget for 2019/20 was R130.4 million.

Water Research Commission

The WRC was established in terms of the Water Research Act of 1971 and is listed as a Schedule 3A public entity. The commission's mandate is to conduct research on water by determining needs and priorities for research, stimulating and funding water research, promoting the effective transfer of information and technology, and enhancing knowledge and capacity building in the water sector. Research is informed by government policies, needs and international trends. The WRC's total budget for 2019/20 was R332 million.

National Water Policy

The National Water Policy is underpinned by three fundamental principles for managing water resources: equity, (environmental) sustainability and efficiency.

All water users who do not receive their water from a service provider, local authority, water board, irrigation board, government water scheme or other bulk supplier, and who use water for irrigation, mining purposes, industrial use, feedlots or in terms of general authorisation, have a statutory obligation to

register. This includes the use of surface and groundwater.

Other uses that must be registered are:

- diversion of rivers and streams;
- discharge of waste or water containing waste;
- storage, which includes any person or body storing water for any purpose from surface run-off, groundwater or fountain flow in excess of 10 000 cubic metres (m³) or where the water area at full supply level exceeds one hectare in total on land owned or occupied by that person or body, and who is not in possession of a permit or permission;
- local authorities and other bulk suppliers with their own water sources and purification works; and
- controlled activities such as irrigating with waste, power generation with water, atmospheric modification or recharging of aquifers.

An assessment of the environmental requirements of the rivers and streams concerned is conducted before a licence can be issued.

To promote sustainable and equitable water resource management, the DWS has developed and continues to update a range of strategies for water management.

National Water Resource Strategy 2 (NWRS2)

The NWRS2 sets out the vision and strategic actions for effective water management, including the security of water supply, environmental degradation, and pollution of resources.

The NWRS2 outlines key challenges, constraints and opportunities in water resource management and proposes new approaches that ensure a collective and adequate response for the benefit of all people in South Africa.

The strategy also responds to the priorities set by government in the NDP and the National Water Act of 1998 imperatives that support sustainable development.

It is centred on these key objectives:

- Water supports development and the elimination of poverty and inequality. The strategy recognises that the manner in which water was allocated in the past was unequal and favoured certain sections of the population. The intention, therefore, is to redress past imbalances in the manner in

which water was allocated, ensuring that water contributes to the economy and job creation.

- Water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner.

The NWRS2 also focuses on water conservation and the management of water demand as key priorities.

Raw Water Pricing Strategy

There have been continued efforts to reform and realign the water value chain so that it can achieve government's objectives since 1994.

These include ensuring equitable access to water and sanitation, the sustainable use of water for social and economic benefit and ensuring the sustainability of water resources and water-services delivery.

As part of this process, the DWS is looking at pricing, financing and economic regulation reforms in the water sector. This project reviews the Raw Water Pricing Strategy, develops infrastructure funding models and recommends an appropriate model and institutional arrangements for an economic regulator for water.

It is generally agreed that pricing and economic regulations play a key role in the provisioning of infrastructure by assuring necessary investments to support socio-economic growth and ensuring that services are widely available and accessible and priced at levels that support current and future needs.

The project will contribute to the following:

- the revision of the Raw Water Pricing Strategy to ensure equitable and appropriate raw water tariffs that will enable sustainable operation and management of raw water infrastructure, and will fund catchment management funding models for water resources infrastructure; and
- the establishment of an economic regulator for the entire water value chain.

The project is strategic in nature and will enable the DWS to have sound water-pricing policies, cost-reflective tariffs for the entire water value chain in South Africa and a good funding framework for infrastructure.

National Groundwater Strategy

Groundwater is a strategic resource in many parts of South Africa, especially in rural areas. It also plays an important role in the supply of water to small towns and villages in the drier parts of the country. There is considerable potential for additional development of groundwater resources to augment existing resources.

The need for improved groundwater management to ensure sustainable and efficient use of the resource was recognised in the NWRS1 and led to the formulation of a National Groundwater Strategy through which strategic actions were undertaken.

Reuse Strategy

The DWS has developed a Water Reuse Strategy to encourage informed decisions relating to water reuse. Reuse could be increased significantly with return flows in coastal cities, where it would otherwise drain into the sea. In coastal cities, water reuse and desalination compete as two options for water conservation.

Reuse is becoming increasingly acceptable and feasible owing to increasing shortages, improved purification technology and decreasing treatment costs. Membrane technologies, also used for desalination of seawater, have become more affordable and have improved.

The reuse of treated wastewater would be managed to ensure public health safety.

Infrastructure upgrades and bilateral agreements

The DWS has made good progress with the preparatory work of the LHWP, which began in 2019.

The Polihali Dam, the Polihali-Katse Transfer Tunnel and other infrastructural aspects of the LHWP phase 2 should be completed by 2024. Once phase 2 has been completed, the amount of water supplied to South Africa through the LHWP will progressively increase from 780 million m³ to about 1.27 billion m³ a year over the following 20 years.

There is progress in the Mokolo and Crocodile River pipeline project, which will transfer water through a 46-km pipeline and pump station from the Mokolo Dam to the Lephallale area. Phase 1 of the Mokolo and Crocodile River West Water

Augmentation Project (MCWAP), which will transfer water through a 46-km pipeline and pump station from the Mokolo Dam to the Lephallale area, is complete. A second pipeline will be constructed as phase 2A of the MCWAP to transfer water from the Crocodile River (West) to the Lephallale area.

The raising of the Hazelmere Dam wall will incorporate a Piano Key Weir, which is cutting-edge technology in dam-building. The additional water that will become available from this project is aimed at ensuring the supply of water and supporting the development of human settlements, King Shaka Airport and the Dube TradePort. The construction of the dam wall is completed and the capacity of dam can be increased to 120% on impoundment of the previous dam level which shall be beneficial to water users.

The DWS is proceeding with the planning of the Mzimvubu Water Project, which entails the development of a multipurpose dam (the Ntabelanga) to supply new irrigation development, and the Laleni Dam for hydropower generation. It has initiated the raising of the Tzaneen Dam and construction of the new N'wamitwa Dam for the Groot Letaba River Water Development Project in Limpopo.

The first phase of the multi-phase LHWP entailed the construction of Katse Dam, Mohale Dam, Matsoku Diversion Tunnel and the Muela hydropower station. Lesotho benefits from a sustainable, independent energy supply that will meet the country's electricity requirements and royalty revenue from the project, while South Africa benefits from the security of supply of high quality water that is transferred into the Vaal River system for domestic and industrial use in Gauteng.

Phase 2 of the LHWP will be implemented in terms of two distinct components: a water delivery system to augment the delivery of water to South Africa and a hydropower generation system, which will increase the electricity generation capacity in Lesotho.

The programme involves the construction of the Polihali Dam and the Transfer Tunnel in the Mokhotlong district, and a hydropower scheme, following the conclusion of a joint feasibility study.

As per the provisions of the phase 2 agreement between the governments of Lesotho and South Africa, the implementation of

the Kobong Pump Storage Scheme or any other hydro scheme was subject to the outcome of a joint feasibility study. The technical and the economic feasibility studies for the Kobong Pump Storage Scheme were completed in 2013. However, the outcome was that further studies should be undertaken. These included, a market study, an integration study, geotechnical investigations and legal and commercial arrangements

Lesotho secured funding from the World Bank to undertake the above studies, including convectional hydropower options. The further feasibility studies have looked at pumped storage and conventional hydropower options. The decision was taken to defer the pump storage option (due to prevailing economic conditions) and advance the conventional options. This entails one site at Oxbow on Malibamatšo River and two sites on the Senqu River.

The topography of the region allows for the possibility of developing a hydro-power generation in Lesotho in conjunction with the provision of water supplies to South Africa. For South Africa, construction of this dam and related infrastructure will guarantee the desired level of water availability in Gauteng and the Vaal River system in the most cost-effective manner. In parallel with water conservation measures in the Vaal River, it will also influence the improvement of water quality amongst many benefits. Phase 2 water delivery and hydropower generation are expected to be commissioned at the same time – early 2026, and the project close out is forecast for December 2028.

The LHWP has two main goals:

- to contribute to South Africa's economic development by providing South Africa with a supply of low-cost high-quality water to meet the household and industrial water needs of Gauteng, the industrial heartland of South Africa; and
- to contribute to Lesotho's economic development by using the water transfer system to increase the country's capacity for generation of electricity that will meet its requirements and earn it revenue in the form of royalties on the water transferred to South Africa.

Each country has the opportunity to undertake ancillary developments within its borders. These developments include the provision of water for irrigation, potable water supply,

the development of tourism, fisheries and other projects for economic and social development.

Rainwater harvesting (RWH)

The National RWH Strategy is an adaptation to climate change. Climate change poses significant social, economic and environmental risks, especially in developing countries. This then necessitates the implementation of high impact climate change response measures that will realise considerable mitigation, adaptation and broader socio-economic benefits.

It is in this context that the DWS, in partnership with the Department of Environment, Forestry and Fisheries (DEFF), is developing a National RWH Strategy to provide a roadmap for enhanced planning, development and scaled-up implementation of RWH as a key component of South Africa's water resources and efforts to enhance climate resilience. The strategy will provide guidance for the implementation of a series of action programmes towards the mainstreaming of RWH in South Africa. This National RWH Strategy will also help serve as the guiding tool for district and local municipalities to effectively and economically put RWH into practice.

The DWS also supports a national RWH programme, which has a narrow but important focus on the construction of above and below-ground rainwater storage tanks by rural households for food gardens and other productive water uses.

Several municipalities now use roof rainwater tanks for domestic purposes. These have been found to be particularly effective when used in conjunction with other water supply options.

Though there are no hard figures yet on how many cubic millimetres per year RWH can contribute, it is an option that can be implemented in a short timeframe.

RWH gives people who live in areas where reticulation has not as yet been implemented access to water. The programme targets rural communities through the installation of tanks and awareness campaigns.

A resource guideline has been developed to assist municipalities that are providing RWH systems to communities as an interim service or to reduce demand on their water supply systems with best practices. In some areas RWH systems are

provided as a drought relief but the DWS is using the programme to advise municipalities to plan for alternative water sources or the "water mix", since municipalities seem to rely on surface water for water services and a lot of water schemes are failing because of dependency on a single source. The same source is affected by issues of water allocation reform (not enough water for water services and other uses), climate change and droughts.

Desalination Strategy

The DWS has developed a supporting desalination strategy, which also includes desalination as a technology for treating water other than seawater for water reuse. Desalination of seawater could potentially provide an unlimited resource of fresh water. However, the rising cost of energy may be a deterrent.

As with other infrastructure projects with potential environmental impacts, the planning for a desalination plant will have to undergo an environmental impact assessment in compliance with the NEMA of 1998.

The DWS will ensure that desalination is considered as an option for meeting future water requirements, in particular in coastal cities where there is sufficient electricity for desalination.

The target is not only to implement desalination in several locations in South Africa, but also to become an international knowledge centre in this particular field.

Resources

South Africa's water resources are, in global terms, scarce and extremely limited. The precipitation per year for Africa is 22 300 cubic kilometres, of which the evaporation rate is 80% and the runoff rate is 20%. Southern Africa only has 12.25% of the total water in Africa, making it a highly arid region.

Rainfall is, however, relatively higher in the northern and eastern parts of southern Africa (the Democratic Republic of Congo (DRC), Zambia and Mozambique) with the drier parts of the region including Namibia, Botswana and South Africa.

South Africa has a mean annual rainfall of approximately 500 millimetres (mm), compared to the world's average of 860 mm. It is characterised by low, variably distributed rainfall as well as high evaporation rates, resulting in the uneven distribution of run-off across the country.

The country experiences severe and prolonged hydrological droughts, which may last as long as 10 years at a time. The quality of water in South Africa is also negatively impacted by dissolved salts from host rocks in certain areas such as Namaqualand in the Northern Cape.

The surface water potential of the major drainage systems in South Africa are dominated by the Orange and the Limpopo river basins, which are shared with neighbouring countries.

Over 60% of the country's river flow comes from 20% of the land area. To overcome the uneven spread of water resources and to manage floods and drought, more than two thirds of the country's mean annual rainfall is currently stored in dams.

The country's water security is mainly reliant on fresh surface water, with groundwater and return flows underused.

However, the freshwater available for use is currently at its limit, and alternative sources such as groundwater needs to be further exploited. In addition, the country shares four major rivers with six neighbouring states, namely Zimbabwe, Botswana, Mozambique, Eswatini, Lesotho and Namibia. Therefore, international agreements on water sharing are in place on all of these river basins.

There is well-developed infrastructure, with more than 4 395 registered dams in South Africa, including 350 dams belonging to the DWS, and a number of large-scale inter-basin water transfer schemes. Water services infrastructure covers more than 35 000 km of bulk pipelines and 200 000 km of reticulation systems that are managed by 152 water service authorities and providers.

However, this existing infrastructure needs maintenance and the country is already experiencing challenges with lack of focus on sustainable asset management. The schemes also require efficient and effective operations, for which specialised skills and capabilities at all levels are needed. Major challenges are experienced regarding the capabilities of water services authorities to effectively manage the schemes on a sustainable basis. This issue needs to be dealt with decisively through a review of the mandates and policies in relation to the management of water infrastructure, and available capacity.

Work is also required in terms of rolling out the establishment of appropriate institutions, such as regional water utilities, as

well as to better leverage private sector support. Non-revenue water is also a challenge to be dealt with.

Medium to long-term capital investment plans must be based on up-to-date reconciliation of changing water requirements and water availability from surface water, groundwater, reuse, desalination of seawater and RWH sources.

The main contributors to water quality problems and environmental concerns are mining (acidity and increased metals content), urban development (salinity, nutrients and microbiological), industries (chemicals and toxins) and agriculture (sediment, nutrients, agro-chemicals and salinity through irrigation return flows). Untreated or poorly treated wastewater is severely affecting the quality of water in many areas, as well as negatively impacting on the environment.

Climate change is expected to exacerbate the already substantial pressure on freshwater and estuarine ecosystems by altering rainfall patterns and the more frequent or intense occurrence of events, such changes in flow patterns, droughts and storms.

South Africa's water ecosystems are not in a healthy state. Of the 223 river ecosystem types, 60% are threatened, with 25% of these critically endangered. Less than 15% of river ecosystems are located within protected areas, of which many are threatened and degraded by upstream human activities. Of 792 wetland ecosystems, 65% have been identified as threatened and 48% as critically endangered.

A further key factor impacting on water quality is the treatment of wastewater. Maintenance of these systems is the responsibility of local government and is highly impacted by a lack of resources and requisite skills to manage and maintain the systems to the required standards, resulting in untreated effluent flowing into river systems, with detrimental effects on the ecosystems.

Acid mine drainage has also been reported from a number of areas in South Africa, including the Witwatersrand Gold Fields, the Mpumalanga and KwaZulu-Natal Coal Fields and the O'Kiep Copper District.

The government must continue to support and lead improvements in water quality and environmental protection across the value chain through a range of interventions,

including the assessment of water supply and wastewater treatment systems and the close monitoring of non-compliant systems in terms of the Water Services Act of 1997.

Dams must be evaluated in terms of dam safety regulations, and water management institutions must be monitored to ensure they in turn effectively monitor affiliated water users. Non-compliance will continue to be investigated and punitive action taken where applicable and possible. In addition, the government must continue to monitor the level of compliance of mines against their water use entitlements.

South Africa's challenge into the future is to ensure that there is fair and equitable redistribution of water resources across the various sectors. This should take into account the country's socio-political and economic transformation agenda. As the country has a limited resource base, with competing sectoral interests, trade-offs must be made in prioritising uses, affordability and sustainability.

South Africa is still heavily reliant on surface water and its further development with more than two-thirds of the country's mean annual runoff already stored in dams. Where additional water is still available, such as in the uThukela, Mzimvubu and Pongola basins, it is located in areas far from the existing centres of demand.

Groundwater currently reflects only 9% use and is underused, undervalued and not well managed. With about 3 500 million m³ of groundwater estimated to be available for further development, much scope exists to exploit the potential of groundwater as a freshwater source.

At 14%, water reuse is already a major component of the water mix, albeit mostly indirectly. Direct reuse, especially in the coastal areas, must be further encouraged. There is also a large scope for increasing desalination, which is currently providing less than 1% of the country's water needs. Inland measures are in place to desalinate acid mine water and brackish water resources, while coastal areas have an opportunity to desalinate seawater.

From the above, the DWS is committed to improve integrated water resource management to ensure continued water security. This includes optimising dam storage and transfer systems, effectively managing the water resources mix and exploring

various options for the reconciliation of water availability with demand.

The already constrained water resources is further impacted by the prolonged dry spells coinciding with the drought legacy conditions in a number of provinces. The predictions of climate forecasting models indicates that dry spell effects could last for up to seven years. Therefore, the construction of additional bulk water storage capacity, such as the LHWP phase 2 and others, are critical to ensuring water security in the long term.

Approximately 9.3% of available potable is water lost through leakage. In the short term, the government's mitigation measures include the implementation of the "war on leaks" programme that will train youth to repair leaking taps and pipes in their communities.

Infrastructure would also be upgraded, rainwater harvested and water desalination projects would be expedited.

Through various communication campaigns, the consumers within the various sectors within agriculture, domestic, industrial, power and mining would be encouraged to limit their water consumption patterns.

Dams and water schemes

In an attempt to respond adequately to demand and anticipate future demand, South Africa has built numerous large and medium-sized dams and developed sophisticated inter-basin transfer schemes. The country now has more than 350 government-owned dams countrywide. They range in storage capacity from a volume of 5 500 million m³ of water down to 0.2 million m³.

Most water consumption can be attributed to drinking, irrigation, electricity, mining processes and industrial processes.

The DWS follows an integrated approach to managing South Africa's water resources. Proposed new water schemes have to comply with the NWRS2, requiring that water demand management programmes be implemented before embarking on new infrastructure development.

Strict environmental impact assessments must also be performed in accordance with laws and regulations administered by the DEFF, while the guidelines issued by the World Commission on Dams must also be followed. Bulk infrastructure

is a critical element of water services infrastructure and an integrated part of water services management.

Groundwater resources

An estimated 80 000 to 100 000 boreholes are being drilled annually. The National Groundwater Archive is a web-enabled database system that allows capturing, viewing, modifying and extraction (dissemination) of groundwater-related data.

The DWS has a legal obligation to ensure that water resources (including groundwater) are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner.

The National Water Act of 1998 requires the establishment of national monitoring and information systems as the availability of information about water resources is regarded as critical to the main purpose of the Act.

The need for groundwater data and information continues to increase to assist in planning to provide water to people, monitoring, drought relief and climate change

Groundwater, despite its relatively small contribution to bulk water supply, represents an important and strategic water resource in South Africa, since it services between 52% and 82% of community water-supply schemes in the Eastern Cape, Limpopo, Northern Cape, North West and KwaZulu-Natal.

The lack of perennial streams in the semi-desert to desert parts means that two thirds of South Africa's surface area depend largely on groundwater.

Although irrigation is the largest user, the supply to more than 300 towns and smaller settlements is very important.

Through government's commitment towards meeting the basic water needs of communities, groundwater has become a strategic resource for village water supply in the wetter parts of the country, because of its cost-effectiveness in a widely scattered small-scale user situation.

Groundwater also contributes considerably to river flow. This requires reserving a significant share of groundwater resources to protect aquatic ecosystems in terms of the National Water Act of 1998. The maximum quantity of groundwater that can be developed economically is about 6 000 million m³ a year, while

some 4 000 million m³ of groundwater (mainly in the dry season) contributes to surface water flow annually.

Southern Africa also has large hidden underground water reserves, with 12 to 15 aquifer systems, of which three are considered very important for the future.

In South Africa, a substantial resource lies in a massive dolomite aquifer system that covers a vast area, extending from Springs and Brakpan, east of Johannesburg to Lenasia, south of the city; Zuurbekom, Carltonville and Magaliesberg on the West Rand; Kuruman in the Northern Cape and even as far as parts of Botswana.

The Witwatersrand mining basin's aquifer storage capacity is about the size of Lake Kariba.

Managing and developing water resources

To facilitate the management of water resources, the country has been divided into 19 catchment-based water management areas, of which 11 share international rivers.

Sufficient water resources have been developed and are available to ensure that all requirements for water can reasonably be met, without impairing the socio-economic development of the country.

Where feasible, special management techniques may be applied to improve water quality to appropriate standards for particular uses. The quality of groundwater varies according to hydrogeological conditions and anthropogenic impact. However, most major aquifer systems contain potable water.

To underscore its commitment to the pursuit of universal access to water, the DWS is investing in new infrastructure and maintaining and rehabilitating dysfunctional systems to ensure operational efficiency.

This is particularly relevant to developing water infrastructure to meet the specific needs of different rural communities. Closely related to rural development is the need for mainstream support to local government to sustain the infrastructure underpinning efficient service delivery to communities.

Managing water quality and wastewater

To ensure compliance with minimum water quality norms and standards, the DWS started the annual Blue Drop and Green

Drop assessments to guarantee that water and wastewater systems are managed according to set norms and standards.

The department has set a target of 99% compliance with drinking water quality standards and 80% compliance with wastewater effluent standards.

This incentive-based regulation system aims to improve the quality of municipal drinking water and management of wastewater.

Because of the scale and magnitude of resources needed for the National Certification Programme, the Green Drop and Blue Drop programmes take place every second year, alternating with each other. In a programme's "gap" year, progress in the wastewater sector is tracked and reported via the assessment of the cumulative risk status of treatment systems.

Strategic Integrated Projects (SIPs)

SIP 18, which was approved by the Presidential Infrastructure Coordinating Commission (PICC), aims to address water supply and sanitation backlogs to millions of households.

The PICC's 18 SIPs are divided into geographic, energy, spatial and social infrastructure development projects. These projects – headed by different departments – cover more than 150 specific infrastructure interventions in rail, road and ports, dams, irrigation systems, sanitation and electricity.

This 10-year plan will address the estimated backlog of adequate water to 1.4 million households and that of basic sanitation to 2.1 million households.

SIP 18 is expected to fast-track the issuing of water licences, expand the capacity of the water system, speed up build programmes, address backlog projects and rehabilitate and upgrade existing water and sanitation infrastructure.

The project, which focuses on priority small towns and rural areas where water service delivery is a problem, is also expected to create jobs, raise the quality of service delivery of water around the country and extend water supply to areas that are either underserved or unserved.

The DWS identified several projects that will be used to drive SIP 18, including the Sedibeng Regional Sewer Scheme – a R5-billion project to be implemented in the area.

Rand Water's BG3 pipeline, which is sub-Saharan Africa's largest water pipeline, running from the Vaal Dam to its Zoekfontein Plant, 8.6 km away, will increase water distribution in this district and surrounding areas.

The BG3 pipeline runs adjacent to Rand Water's existing BG1 and BG2 pipelines that supply water to Gauteng and parts of the neighbouring Free State, Mpumalanga and North West.

The Komati Water Scheme Augmentation Project was designed to resolve the water supply problems to Eskom's Duvha and Matla power stations in Mpumalanga.

The Komati Water Scheme Augmentation Project supplements the Komati Water Scheme from the Vaal Eastern Subsystem to help Eskom overcome its water supply challenges.

The interaction of the water resources of the Komati, Usutu and Vaal River systems provides a higher assurance of water supply to all Eskom's thermal power stations and other water users in Mpumalanga. The Komati Water Scheme Augmentation Project will deliver an additional 57 million m³ of water a year to the Komati Water Scheme.

Dam Safety Rehabilitation Programme

The Dam Safety Rehabilitation Programme ensures the continued structural and operational safety of the dams owned by the DWS.

Water Allocation Reform Programme

The Water Allocation Reform programme's objectives are to ensure equitable access to water, eradicate poverty and promote social and economical development.

The programme's priorities are to meet the water needs of historically disadvantaged people, ensure their participation in water resources management and promote the beneficial and efficient use of water in the public interest.

Licences are required for storage and use of water, among other things. To facilitate the availability of water for historically disadvantaged people, attention is also given to the allocation of water following principles of equity and sustainability.

Women in Water

The Women in Water Project aims to strengthen the active participation of rural women in water resource management.

Women identify water-related challenges in their communities and conceptualise ideas to address them. They are registered for Women in Water awards. The national winners receive cash prizes which are used for further project development and implementation.

Learning Academy

There is a shortage of skills in the water and sanitation sector. The DWS, as the custodian of South Africa's water resources, through its Learning Academy External Bursary Scheme, provides bursaries yearly to aid in closing this gap. Applications are open to people who would like to pursue careers that are in line with the department's core business.

The department scheme boasts an all-inclusive package recognised in South Africa as being highly competitive. The DWS External Bursary Scheme aims to attract exceptional young and innovative talent to the department.

Students pursuing the following fields of study are eligible to apply: Analytic Chemistry, Aquatic Sciences, Biochemistry, Biological Sciences, Water and Sanitation, Geographical Information Systems, Civil/Electrical/Mechanical Engineering, Water Resource Management, Environmental Law/Management/Science, Water Utilisation, Cartography, Geochemistry, Geo-hydrology, Geology, Hydrology, Limnology, Microbiology, Surveying and Water Care.

The purpose of the learning academy is to:

- investigate technical and scarce skills development needs within the department;
- address technical and scarce skills gaps in the overall water supply value chain;
- address scarce skills gaps in specific technical areas of the department;
- plan and build capacity for medium and long-term needs of the department and the water and sanitation sector;
- develop and implement structured training for engineering and scientific graduate trainees;
- develop and propose interventions (regarding mentoring, skills and knowledge transfer, and professional registration processes) with the Engineering Council of South Africa, the South African Council for Natural and Scientific Professions

and the Surveying Council of South Africa in line with the Occupations Specific Dispensation.

Management of water conservation and demand

Although South Africa has been classified as a water-scarce country, water from the source to the consumer is often lost as a result of inappropriate and inadequate asset management.

Lack of education on the part of the consumer also leads to inefficiency in the day-to-day use of water. The loss of water depletes the country's resources and reduces revenue to water services authorities.

Water leaks account for nearly 36% of the nation's unaccounted for water and costs the country about R7 billion annually.

Realising that South Africa is a water-scarce country, the DWS is also putting in place medium to long-term interventions that are intended to reduce the risks for water scarcity in the future.

These include:

- RWH (drinking water, water for livestock, water for irrigation);
- integrating groundwater and surface water use in the future;
- desalination at a large scale;
- investing in innovative water-saving solutions, such as the Drop-the-Block Campaign;
- incorporating all municipal and privately-owned dams into the management system or the future;
- implementing further transfer schemes to improve drought resilience;
- building additional storage capacity; and
- rolling out large-scale reuse of water (recycling of effluent, focus on coastal towns where treated effluent is disposed of via sea outfalls and not taken into account in return flows).

Enhanced local government support approach

A rapid response unit in the DWS addresses poor performance of water and wastewater systems, which has resulted in community protests in some cases.

The unit deals with proactive and reactive non-compliance cases of municipal service delivery. The unit's specialists enable the department to intervene directly in high-risk operational

situations, where the lives of citizens and the environment are under threat because of water and wastewater treatment failures.

Freshwater Programme

Recognising the value and threatened status of South Africa's freshwater biodiversity, and the need to build competence and leadership in this area, the South African National Biodiversity Institute (SANBI) has established a programme focusing on freshwater biodiversity.

The programme aims to grow and consolidate freshwater activities within SANBI.

The Freshwater Programme focuses on supporting collaborative freshwater initiatives. These include Working for Wetlands, the National Wetland Inventory, National Freshwater Ecosystems Priority Areas Project, a wetlands mitigation banking scheme with the Grasslands Programme and coal-mining industry, and water-related payments for ecosystem services pilot projects.

Key to the programme's operation will be the further development of strategic relationships with other organisations with shared objectives. It includes managing the Working for Wetlands Programme on behalf of the departments of Water and Sanitation, Environment, Forestry and Fisheries, and Agriculture and Rural Development. Working for Wetlands champions the protection, rehabilitation and sustainable use of South Africa's wetlands through cooperative governance and partnerships.

Monitoring programmes

River flow is monitored at 1 200 flow-gauging stations and some 260 major reservoirs. The evaporation and rainfall station network has 360 stations.

The oldest flow-gauging station still operating in South Africa is on the Mooi River near Potchefstroom in North West.

There are 21 operational rainfall stations in the mountains of the Western Cape and five in the Mpumalanga escarpment. Observations are relayed through a cellular short message system.

Water levels are monitored at some 1 000 observation boreholes across South Africa. Particular attention is given to

monitoring in dolomitic areas. In addition, a small network of rain gauges monitors rainwater quality.

The importance of qualitative information on South Africa's water resources has led to an increased drive towards creating a national water-quality monitoring network.

The formal protection, restoration and rehabilitation of wetlands is strengthened through improved land-use planning, land and development management policies, as well as operational and regulatory means at national, provincial and local level.

Adopting of ecosystem-based approaches and implementing the open-space planning and management programmes adds impetus to the protection of these systems and associated services, especially at local government level.

It requires integrated approaches and the involvement of multiple sectors, particularly those dealing with human settlements, development and planning.

The DWS is also designing programmes to assess and report on the radiological (radioactivity) and toxicological quality status of the country's water resources.

National Chemical Monitoring Programme (NCMP)

The NCMP assesses and reports on the chemical status of water resources in South Africa. The main water-quality challenges for domestic water users are high levels of dissolved salts and, in some places, high fluoride concentration. The other challenges facing irrigated agriculture are the high sodium-absorption ratio, high electrical conductivity, high pH and high levels of chloride.

Another global challenge affecting South Africa is eutrophication or excessive plant (including algae) growth in dams. This is because of high levels of nutrient input from point sources of pollution and diffuse sources of pollution from catchments.

Annual reports indicate that 50% of dams in South Africa are seriously affected (hypertrophic), while the rest range in quality from good (oligotrophic) to poor (mesotrophic).

Another problem is the sporadic outbreak of cholera and other water-borne diseases, mainly because of poor sanitation and hygiene at household level. The Eastern Cape and KwaZulu-Natal are prone to cholera outbreaks.

Integrated Water Quality Management Strategy

The pollution of South Africa's water resources, both surface and underground water, not only adversely affects human and environmental health but has severe consequences for the economy and social well-being. In response to the country's need to take an improved integrated approach to Water Quality Management (WQM), the DWS recently developed an integrated WQM Strategy. This strategy sets forth a number of objectives, each supported by key actions, which collectively aim to ensure that the government, in partnership with private sector and civil society, secures water that is fit for use for all. These actions range from the need to strengthen institutions, to the need to improve monitoring and information management, and to strengthen regulation of activities that degrade water quality.

Managing water resources under a changing climate

With climate change, water resources that are already under pressure due to increasing water demand will be under even greater stress in the future. Already, physical evidence suggests that there are changes in historical rain patterns and intensities, as observed in the increasing temperature and drought trends. Water distribution in South Africa is spatially skewed, with decreasing rainfall and increasing evaporation from east to west. Even though rainfall trends cannot be clearly defined, it can be said with high confidence that potential impacts of climate change in South Africa on water availability will be negative. Just with increasing temperatures alone without considering other climatic and non-climatic factors, evaporation rates will increase and that will affect water availability. Climate change impacts on the water sector will thus, amplify the current existing conditions.

The DWS has made good progress in trying to understand the impacts of climate change on the different water management areas through conducting Risk and Vulnerability Assessment Studies, and accordingly suggested adaptation strategies as appropriate. These studies reveal that catchments in the eastern side of the country, for example, the Mzimvubu-Tsitsikamma water management area, rainfall has shown an increasing trend, and the area is also projected to experience increasing

rain days both in the intermediate and distant futures. This, however, comes with other challenges such as severe erosion and siltation.

Evaporation rates, in most cases, have been shown to exceed precipitation, becoming relatively higher in areas where it rains less, for example, in the Lower Vaal and Lower Orange catchments. What needs to be considered even further is not only the direct impacts of climate change on the water sector, but secondary impacts on other water dependent sectors, such as agriculture, mining and energy. As such, any adverse impacts of climate change, may negatively affect progress towards development in a number of economic sectors in the country.

National Water and Sanitation Master Plan (NW&SMP)

The development of the NW&SMP aims at mobilising the commitment and efforts of all role players and stakeholders in the water and sanitation sector towards collectively achieving the desired future state of the sector, as defined by the government's vision, goals and targets until 2030 (NDP, Sustainable Development Goals, MTSFs and other key drivers). It will provide a critical overview of the present state in the sector and the key challenges it is currently facing, together with a consolidated plan of actions required to enable the achievement of the set targets.

The plan of actions include a detailed schedule of consolidated and prioritised interventions, actions, investments, projects and initiatives. For each action, the plan defines specific intermediate and final targets, the parties responsible for their achievement, the deadlines for delivery and the estimated costs or other required resources. The achievements will be monitored and evaluated annually by a dedicated project management unit managed by the DHS. The NW&SMP will be updated bi-annually to reflect the dynamics in the sector. It will act as the implementation tool for the Water and Sanitation Resources and Services Strategy, and the two documents will be aligned.

National Aquatic Ecosystem Health Monitoring Programme (NAEHMP)

The NAEHMP is a national programme managed by Resource Quality Services with support from the WRC, the Council for

Scientific and Industrial Research and various regional and provincial authorities.

It is responsible for managing aquatic ecosystems. It focuses on the biological attributes of a river that serve as indicators of its ecological health. The NAEHMP's main objectives are to:

- generate a national perspective of the health of aquatic ecosystems in South Africa,
- develop the capacity and information base required to enable the DWS, and other role players, to report on the status of and trends in the ecological health of South Africa's river systems, in an objective and scientifically sound manner, and
- generate information products and audit-management strategies that could assist in distinguishing between aquatic ecosystems exposed to sustainable use, and those experiencing ecological deterioration.

The NAEHMP comprises three separate monitoring programmes namely:

- The River EcoStatus Monitoring Programme (REMP): This is the oldest component of the NAEHMP. It focuses on the monitoring of ecological conditions of river ecosystems as it is reflected by the system drivers and biological responses. The basis of the REMP is the establishment of a reference condition derived from best available information. Present conditions (ecological category) for the different indicators are determined as a change from reference. The REMP is built upon the use of particular models incorporating existing approved EcoStatus models. The assessment can be done on a sub-quaternary or site level and includes the use of the Index of Habitat Integrity, Fish Response Assessment Index, Macroinvertebrate Response Assessment Index, Vegetation Response Assessment Index and Integrated Ecostatus. Monitoring is conducted on a quarterly basis and technical reports produced annually. Currently a number of provinces are only partially implementing the REMP, focussing mostly on the macroinvertebrates and habitat components but the programme is fully implemented in the Inkomati-Usuthu as well as the Breede-Gouritz, Berg-Olifants and Pongola-Mtamvuna water management areas. Information obtained through the REMP is also used in monitoring the biological and habitat components of the Resource Quality Objectives.

- The National Estuaries Monitoring Programme (NEsMP): The purpose of this programme is the monitoring of water quality, physico-chemical and biological aspects for determining long-term trends and changes in the condition of South African estuaries. The NEsMP coordinates national monitoring efforts and provide support in the form of sampling equipment, training, data management and information dissemination, while collaborating institutions collect physico-chemical data and water samples.
- The National Wetland Monitoring Programme: The programme's design is based on minimising duplication of effort, while maximising the value of outputs of wetland assessment and monitoring, finding suitable methods for prioritising wetland to be assessed and monitored, adaptive management and maximum engagement and participation by stakeholders. It has not been implemented yet, but aims to assess and monitor the extent of wetlands, the threats to and the change in the present ecological state and ecosystem services provided by wetlands in South Africa. It is a "state-of-wetland" reporting programme, designed to demonstrate trends in the state or integrity (biological, physical & chemical components of its ecosystem and their interactions) of wetlands over time.

National Toxicity Monitoring Programme

The National Toxicity Monitoring Programme reports on the status of dichloro-diphenyl-trichloroethane (DDT) and other persistent organic pollutants. This information is reported internationally to the Stockholm Convention through the DEFF.

The National Toxicity Monitoring Programme was designed to assess the status of water resource through measuring the concentration of a selection of priority pollutants at a number of "hot spots", and also assessing the toxicity of the water to some aquatic organisms through direct measurement of effect. The priority pollutant selection is aligned to the extent possible with South Africa's responsibility for reporting under the Stockholm Convention. The geographic distribution of monitoring points is still largely determined by fiscal and operational constraints. It currently focuses on the upper reaches of the Crocodile (West)-Marico and Olifants River catchments. The combination

of chemical and biotic assessment in conjunction with the other national monitoring programmes also supports strategic and operational decision making by identifying areas of impairment of fitness for use. The first five years of monitoring indicated that the persistent priority pollutant concentrations were generally low but that mild seasonal toxicity occurs, possibly in conjunction with agricultural activity. It also tends to confirm that the major human exposure route of DDT (used in malaria vector control) is unlikely to be through the water. Future development includes extending analyses to riverine sediments.

Education and awareness

Youth development and National Water Week

The sub-directorate Youth Development, within the DWS, is responsible for the coordination of youth development programmes within the department, and the water and sanitation sector. Activities conducted by the unit are guided by the Youth Accord and National Youth Policy Vision 2020, which concentrate on the integrated approach towards job creation, skills development and entrepreneurship. A youth development strategy has been developed as a guiding document towards meeting the commitments made in the African Ministers Council on Water Youth Development Strategy.

The National Water Week is an awareness campaign by the DWS. It serves as a powerful campaign mechanism reiterating the value of water, the need for sustainable management of this scarce resource and the role water plays in eradicating poverty and underdevelopment in South Africa.

The campaign seeks to continue building on the ongoing awareness creation within the broader South African community.

This awareness creation is coupled with the responsibility that every citizen must take in ensuring the integrity of South Africa's water resources and its efficient use.

The 2020 National Water Week took place from 16–22 March. The event focused public attention on the importance of water, raising awareness on the use, management, conservation and protection of water resources.

The linkages between water services, supply, resource management, poverty eradication, social and economic

development were emphasised in a number of innovative ways. The campaign is influenced by local needs and international sectoral trends.

Regional and international cooperation and initiatives

In line with the DWS's regional and international responsibilities in the water sector, the department entered into collaborative relationships with countries such as:

- Lesotho, Namibia, Botswana, Zimbabwe, the DRC and Eswatini in the region.
- Mozambique and Eswatini on the Inkomati and Maputo rivers.
- Botswana, Lesotho and Namibia on the establishment of the Orange Senqu River Commission.
- Botswana, Zimbabwe and Mozambique on the establishment of the Limpopo Watercourse Commission.
- Lesotho on the LHWP.
- Eswatini on the Komati River Development Project.

These agreements improve South Africa's bilateral and multilateral relations in the African Union. All the countries involved benefit, while sharing development costs.

South Africa shares four of its major river systems with six immediate neighbouring countries, namely Botswana, Lesotho, Mozambique, Namibia, Eswatini and Zimbabwe.

In the area of shared river basins, South Africa continued participating in joint water commissions to form part of Africa bilaterals with Botswana on Joint Permanent Cooperation, and with Mozambique regarding the breach of the Usuthu River, where a feasibility study was completed.

South Africa also has global relations with countries such as Iran, China, Denmark, Russia, Mexico, South Korea, Australia, Germany, the Netherlands and Japan.

Acid Mine Drainage

The DWS launched the Eastern Acid Mine Drainage Treatment Plant, which ensures that the rising water levels in the abandoned Grootvlei mine do not contaminate groundwater.

The Eastern Basin Plant in Springs is one of the largest of its kind in the world, treating approximately 110 megalitres (ML) per day.

The plant is among the three main basins in the Witwatersrand Goldfields. These include the Western Basin in the Krugersdorp area, Central Basin in the Germiston area and the Eastern Basin in the Springs area. Both western and central basins have been launched and are running smoothly.

The first long-term solution to acid mine drainage was launched at the Central Basin Acid Mine Drainage Treatment Plant in Germiston in 2016. This was the commencement of several integrated projects aimed at providing a long-term solution to acid mine drainage as well as a water-secure future for the economic hub of Gauteng.

The Eastern Basin Plant in Springs is one of the largest of its kind in the world, treating approximately 110 ML per day.

The Eastern Basin Plant is located in one of the three main basins in the Witwatersrand Goldfields. These include the Western Basin in the Krugersdorp area, Central Basin in the Germiston area and the Eastern Basin in the Springs to Nigel areas. Both the Western and Central Basins were commissioned previously and are running smoothly.