WATER SERVICES DEPARTMENTAL SECTOR PLAN

FOR

CITY OF CAPE TOWN
2012/13 – 2016/17 IDP TERM

EXECUTIVE SUMMARY

Please note that this version is a 2013/14 review which coincides with the IDP 5-year term of office plan.

Editing revision 26 August 2013

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1. CONTEXT

This sector plan executive summary forms part of the broader Water & Sanitation sector plan, which supports the IDP for 2013/14. The sector plan is structured to align with the Department of Water Affairs requirements for a water services development plan. As such, the sector plan provides for integrated planning which includes a public participation process and is updated annually.

2. INTRODUCTION

2.1. Introduction with Focus on Basic Services

The Water and Sanitation Department has made significant progress in providing water and sanitation services to the City of Cape Town residents since the formation of one Metro administration. All formal areas are adequately provided with water and sanitation services. However, improved services can still be further achieved within Informal Settlement areas provided that the unique technical, social, political and land challenges, that needs an integrated approach with the Department of Human Settlements, are adequately managed. The unprecedented and vibrant economic growth of the City ,in some new developing regions, the demand outstrips the installed capacity. This impacts on the ability to provide services at the improved target.

To ensure sustainable, fair, equitable, reliable and financially viable provision of water and sanitation services, the Department has developed and is implementing strategies that address the challenges impeded in the scorecard, represented by the Service Delivery Business Improvement Plan (SDBIP), this ensures effective water utility management. The strategies also seek to ensure compliance with the National Water Act, Water Services Act and the related regulations, National and City Policies.

Progress on the objectives as set out in DWA's critical policy document, the National Strategic Framework for Water Services (September 2003), were measured at a June 2012 baseline.Following on a review of available data on the June 2012 number of informal settlements and the total household estimate in the City, the estimates for both these household figures were evaluated significantly higher. The Informal Settlement household count of 193 951 adopted was obtained after door-to-door surveys by the Solid Waste Department, replacing the previous aerial photo count which failed to identify all the households residing under one visible roof. The conclusion was reached that previous household numbers had been underestimated for the past

couple of years. largely increasing the apparent challenge for sanitation provision and to a much lesser extent for water provision. Fortunately, during the commenting and drafting period of this plan, the results of the 2011 Census became available and have indicated a contrary reduction in Informal Settlement dwellings to 143 823 households which more closely aligns with an expected year on year population growth rate if the high figure of 2012 is excluded. This more realistic scenario is not yet reflected in this plan with a June 2012 base date preceding the 2011 Census outcomes.

The number of available communal taps has shown a decrease due to an operational necessity to reduce the fitted two taps at each communal standpipe to one in order to limit the associated problems of excessive grey-water ponding and health risks. This combined with a GPS survey confirmation of the actual serviceable taps remaining in operation has led to a reduction in the number of available taps, despite additional standpipes being installed every year for several years.

The growing housing challenge in the COCT has given rise to an increasing number of backyard dwellers in public rental stock. COCT has drafted a backyarder policy which will include the supply of separate basic services such as electricity, refuse removal, water and sanitation to this sector. For water and sanitation this is taking the form of an individual metered connection via a water management device and a sewer connection with a prefabricated toilet. The increased density reduces the cost of new infrastructure but increases the water demand and sewer load on existing infrastructure considerably.

The re-adjustment in base information limits the usefulness of a year-on-year comparison as required by the DWA indicators, but is nevertheless given along with the latest known information to allow forward planning as per the Servicing programme. To ensure and to measure the level of progress, internal service level targets for the City of Cape Town that exceed the national standards are in use.

Table 1: National minimum basic service standards

Service	National Standard (1)
Sanitation	Easy access to a safe, reliable, private toilet facility which is protected from the weather, ventilated low smell, hygienic, minimises the risk of spreading diseases and enables safe treatment and/or removal of human waste and wastewater in an environmentally sound manner including communicating hygiene
Water	A basic water supply facility within 200m of dwelling, delivering at least 25 l/ person/ day at a minimum flow of 10 l/min in the case of communal water points, or 6 000 litres of water per month in the case of yard or house connections

NOTES(1) As defined in the National Strategic Framework for Water Services, Sep-03

To achieve the improved service indicated above, the Department of Water and Sanitation has developed a vision which seeks to constantly explore improved and responsive approaches in the provision of these essential services.

2.2. Vision and Mission of Water and Sanitation

The vision of Water and Sanitation Services in Cape Town is:

VISION STATEMENT
To be a beacon in Africa for the provision of Water and Sanitation services
MISSION STATEMENT
We pledge to achieve our vision by creating a centre of excellence in Water and Sanitation Department through: • Optimizing resources • Implementing environmentally-sustainable interventions • Continuous improvement and knowledge management • Good governance • Customer satisfaction and excellent stakeholder relationships Values • Integrity: We maintain the highest level of ethics and fairness in our interaction with each other, our customers and other stakeholders. • Respect: We respect each other's opinion, beliefs, position and contribution to the Department including those of our customers and other stakeholders. All employees are equal in their contributions. • Customer focus: We meet customers' needs by providing excellent service, optimal product performance and efficient support system. Our customers are the reason for our existence. The environment is our silent customer who shall receive an equal share of our services. • Trust: Our business model and relationship is based on trust. A "Yes" shall mean a Yes and a "No" shall mean a No. Our common purpose, integrity and honesty shall constrain us to have trust in each other. Trust shall be felt, experienced, lived and seen in our Departmental family. • Transparency: We operate safely, openly, honestly and with care for the environment and the community. Transparency shall be defined by the customers and stakeholders we serve. • Professional: We use the right skills or competencies to find appropriate solutions enriched with compassion, innovation, sustainability, cost-effectiveness, accountability and excellence.

2.3. Business Focus Area

The Water and Sanitation department has adopted the framework for the attributes of effective water and wastewater utility management developed by the American Water Works Association (AWWA) as a balanced scorecard for its business management. The framework covers all aspects of the Water and Sanitation business necessary to position the department to achieving and contributing effectively and efficiently to the achievement of the City vision. The following are the ten attributes that have been adopted:

a) **Product Quality:** looks at the ability of the department to meet the potable water quality standards licence conditions, the Department of Water Affairs general wastewater effluent standards, environmental management requirements and ecological needs.

b) **Customer Satisfaction:** looks at the ability of the department to provide basic services to all residents in the City, sanitation at a targeted improved level of service, provision of affordable service, meeting Service Charter standards, level of service and standard of service. The department seeks to provide services to backyarders on a direct basis in agreement with the landowners such as the Directorate of Human Settlements and private household owners.

c) **Employee and Leadership Development:** the department has a challenge to develop and retain its employees and ensure high levels of motivation among employees. This challenge demands that the department must ensure adequate staffing levels, skills retention, succession planning and individual development of employees so that their progression into management or a specialist function is supported adequately.

d) **Operational Optimisation:** this attribute forces the department to review its business processes to ensure timely on-going cost-effective, reliable and sustainable service provision in all its operations. The department is challenged to minimise resource utilisation, losses and take advantage of technological advancement to better its efficiency levels in providing water and sanitation services.

e) **Financial Viability:** the focus is for the department to improve its collection ratios and ensure that the tariffs, charges or any levies are total cost-recovering in nature. In addition there is a need to reduce high debt levels and improve the willingness to pay by its consumers. The investment into infrastructure must also be well-timed, synchronized with

mutual projects and appropriate funding explored to ensure a good return on investment. The cost of capital must be minimised and the challenge is how to achieve this given the consolidated nature of the investment decisions in the City. The department must also ensure effective utilisation and timely maintenance of its assets to sustain revenue growth levels that is in sympathy to the consumer base growth.

f) **Infrastructure Stability:** this business attribute requires the department to understand when to create and dispose of an asset, the condition of its assets, lifecycle costs, the associated costs to be incurred in unlocking asset value, to sustain the business. The department must ensure timely maintenance, repair, rehabilitation, replacement and upgrading of existing infrastructure. The lifecycle costs of the assets must be well understood and asset management plans developed. The department is currently developing asset management plans to be integrated into the SAP system modules and this process is a huge challenge that requires time and resources to complete.

g) **Operational Resilience:** this business focus area requires the department to ensure adequate risk management for its water and wastewater business. To this end the department has developed the draft Wastewater Risk Abatement Plan and the draft Water Safety Plan and the Department of Water Affairs' requirements of these plans are increasingly becoming stringent. The establishment of operational tolerance levels that ensures adequate management of the legal, regulatory, financial, environmental, safety, and national disaster risks are still to be finalised. Servitude Encroachment is a risk to the department that affects the operational resilience of its service provision value chain.

h) **Community Sustainability:** this focus area ensures infrastructure investment led job creation for communities in the City of Cape Town. This will assist in improving the disposable income of households and enhance their ability to pay for water and sanitation services. The department must ensure that its operations, services output and by-products such as sludge and wastewater effluent do not harm the environment and compromise community health. Infrastructure Management and Operations must be managed to ensure efficient utilisation of water resources, energy and promote economic vitality with minimum impact on the environment. Efforts should therefore be made to ensure investments are green and climate change impact is managed.

i) **Water Resource and Demand Management:** as it is, this business attribute focuses on the ability of the department to ensure security of water supply. The department has a

challenge to ensure that by 2017 a new source of water supply to the City will have been developed either directly by the department or through Department of Water Affairs. The department has to keep pace with future customer needs for basic services and economic expansion through long term resource planning, long term demand analysis and conservation of the existing resources.

j) **Stakeholder Management:** this attribute requires the department to identify the representatives of various stakeholders and ensure adequate engagement in issues that affect them. Differing views between interest groups as well as politized actions in Informal Settlements is a challenge for the department in its quest to provide the targeted improved level of service. The department must also ensure adequate engagement with the Department of Water Affairs, the Provincial Government and other directorates in the City for the purpose of optimising investments into improvement programs and risk management.

2.4. Critical Challenges

Out of the business focus areas described above, the Water and Sanitation Department has identified the following as critical challenges that constitute the risks to the business and are clustered into four categories:

(a) Financial viability

- Collection ratio and willingness to pay for services
- Metering and billing
- Ensuring full cost recovery and acceptability of the tariffs by the consumers
- Reduction in unaccounted for water
- High financial requirements
- High cost of doing business
- High debt due to non-payment

(b) Customer satisfaction

- Meeting Service Charter standards
- Provision of basic services to Informal Settlements and Backyarders
- Availability of services for infrastructure expansion
- Appropriate service standards and level of service

- Providing a targeted improved level of service
- Provision of affordable service

(c) Water Resource and Demand Management

- Achieve water demand targets through intensified WDM strategy
- Development of additional water sources
- Treated effluent re-use and its acceptance
- Provision of adequate infrastructure to meet City development/growth needs

(d) Employee development (internal)

- Establish effective institutional arrangement
- Sufficient staff resourcing, skills retention and development
- Increasing productivity, efficiency and effectiveness in the operations of the business

(e) Operational Optimisation

- ISO 9000 certification
- ISO 17025 laboratory certification
- Processes re-engineering and right-sizing of the department

(f) Product quality

- Meeting the licence conditions for Wastewater Treatment Works
- Meeting the amended SANS 241 standards

(g) Operational Resilience

- Water Safety Plan development;
- Wastewater Risk Abatement Plan
- Servitude enhancement
- Developing and managing the Risk Register
- Asset Management

The strategies to face these challenges are dealt with under the appropriate section of the plan following.

2.5. Strategic Objectives

In order to implement the business plan, strategic objectives have been set as follows:

Strategic Objectives	Target
To implement ISO 9001 for all our services in the next five years	2015/16
To achieve Green Drop status for 60% of the waste water treatment plants (i e 18 plants)	2015/16
To achieve 95% waste water effluent quality	2015/16
To ensure the presence and dominance in Africa of the water-, wastewater- and air pollution-testing services	2015/16
To reduce unaccounted for water to 16% in the next five years	2015/16
To provide basic or emergency sanitation services to all residents of the city	2015/16
To provide basic water to all residents in the city	2015/16
To increase productivity levels by 15%	2015/16
To achieve 90% customer satisfaction levels in all our services	2015/16
To develop Asset Management Plans for the Department	2012/13
To be the reference City for water matters in the country	2015/16
To grow the training school and achieve SETA accreditation for the training modules (e.g. process controllers, artisans)	2012/13
To minimise river systems pollution by reducing sewage overflows by 20%	2015/16
To improve revenue collection to 96%	2015/16
To construct an office block for the department	2015/16
To be information efficient	2012/13
To increase security of supply for the bulk water supply system: percentage potable water production capacity of peak week demand to120%	2016/17
To increase the effluent re-use by 15% of potable demand	2015/16
To roll out automation and remote control pilots on treatments and pump stations	2014/15

2.6. Aligning the WSDP and IDP

The challenge for the Department is to maintain an existing Water and Sanitation service for the city while also providing services for an ever-increasing number of households in a sustainable way. This has to be achieved in the context of providing basic needs, ensuring economic growth, maintaining an ageing infrastructure, limiting negative environmental impact, managing water resource scarcity and consolidating a transformed metro administrative infrastructure. The following matrix depicts how the IDP focus areas will be accommodated in the Strategic thrusts of the WSDP.

Table 2: IDP Priority Issues Relating To Water Services

Strategic Focus Area	Objective	Programme	Water Services Business Elements									
			1. Socio - Economic Profile	2. Service Level Profile	3. Water Resource Profile	Conservation / Demand	5. Water Services Infrastructure Profile	6. Water balance	7. Water Services institutional arrangements Profile	8. Customer Service Profile	9. Financial profile	10. List of Projects
			Page Numbers									
1.THE OPPORTUNITY CITY	Objective 1.1 - Create an enabling environment to attract investment to generate economic growth and job creation	P1.1(c) Identify and promote catalytic sectors, such as oil and gas	x									
	Objective1.2 - Provision and maintenance of economic and social infrastructure to ensure infrastructure-led growth and development	P1.2(b) Maintenance of infrastructure					x					
		P1.2(c) Investing in Infrastructure					x					
	Objective 1.3 – Promote a sustainable environment through efficient utilization of resources	P1.3(a) Sustainable utilization of scarce resources			x	x					x	x
		1.3(b) Water Conservation and Water Demand Management Strategy			x	x	x	x			x	x
2.THE SAFE CITY	No direct link to Water Services objectives											
3. THE CARING CITY	Objective 3.4 Provide for the needs of informal settlements and backyard residences through improved services	P3.4(b) Service delivery programme in informal settlements		x								
		P3.4(c) Backyarder service programme		x		x						
	Objective 3.7 Provision of effective Environmental Health services.	P 3.5(a) Environmental Health Care Programme			x	x						x
4.THE INCLUSIVE CITY	Objective 4.1 Ensure responsiveness by creating an environment where citizens can communicate with and be responded to.	P4.1(a) Managing service delivery through the service management process (C3 notification responsiveness)		x		x				x		
		P4.1(b) Building strategic partnerships				x						x
5.THE WELL-RUN CITY	No direct link to Water Services objectives								x			

3. ESSENTIAL QUESTIONS

3.1. What is the targeted improved level of service for Water and Sanitation Services?

These statistics must be viewed bearing in mind that they predate the Census 2011 results obtained in 2013 and hence paint a bleaker picture than is thought to be the case at the time of this plan's approval in mid 2013.

The majority of Cape Town's population, both in formal and informal settlements, receives potable water service levels that generally meet the National minimum standards as required by the Water Services Act 108 (of 1997).

Based on previous informal settlement household estimates, the % households with access to sanitation, monitored on a quarterly basis along with other Key Performance Indicators for the Departmental Scorecard, appeared to exceed 100% at June 2012. This was achieved through the rollout of various toilet technologies that demand less social and technical planning durations (11/12 Water and Sanitation Departmental SDBIP- Fourth Quarter).

However it is acknowledged that many of the toilet types cannot comfortably sustain use by more than 3 households while others work best for only 1 household. Taking these variable servicing ratios and the variation in density of service points from settlement to settlement into account, it is estimated that approximately 77 783 (as at June 2012) households still need a better service compared to 80 364 (as at January 2012).

The total number of toilets installed as at 2011/12 financial year was 34 225 units. The growing density in many informal settlements constrains the City's ability to adequately provide further sanitation and other services.

The high household estimates, combined with the necessary policy change to only use 1 tap per standpipe, also meant that the 100% score for households having access to potable water. The % of all households serviced was at 99.1% while 16.9% (as at June 2012) of all households in the city were supplied from standpipes.

The maintenance of these temporary services often carry high maintenance cost due to frequent cleaning and repair or replacement due to vandalism. It is not financially sustainable and requires a national initiative or at the very least an order of magnitude improvement in the

level of funding from the Equitable Share grant. In the case of the City of Cape Town, the cost of these services is to a large extent being subsidised by the formal sector.

3.2. What is the Status of Supply to Higher Levels of Service?

Service levels to all formal developed areas are, as far as can be determined, at the highest level of service: a flush toilet and water connection in-house or yard. This constitutes 92.9% of the consumer households. The backyarder policy will increase the number of connections per erf.

3.3. What is the Cost to Achieve the Targeted Improved Level of Service ?

To achieve sanitation improved service and service the increased number of households in informal settlements, the Water and Sanitation Department is implementing a service provision program that is integrally tied to the 10-year Housing Plan.

The total capital requirement over the next 5 years from 2012/13 to 2016/17 to primarily cover sanitation service provision is estimated at R247 million including allowance for a 5% household growth. Part of the funding is also required for the replacement of the remaining black buckets.

R9.0 million is required to achieve the targeted improved water service level and provide for the anticipated growth in demand.

The proposed programme for achieving the Strategic Objective target of 2016/17 is aimed at an improved level of service with a minimum ratio of 1 tap to 25 households with the tap being within 200m of any households

Idealy water and sanitation would like to achieve improved service levels within five years. However due to various challenges, Water and Sanitation are currently only able to deliver approximately 3 100 sanitation units per annum, some of which can service more than a single household depending on the type installed. This should be compared to the latest census of 2011 indicating an informal settlements household average growth of 3 371 households per annum.

The challenge to delivery in these areas is amplified by;

- lack of space and the extreme densities of settlements
- resistance from the community

- Greywater ponding problems
- settlements located on private land, closed landfill sites or other unsuitable land
- the level of community acceptance of non-waterborne sanitation.

The Draft Backyarder policy introduced in 2012, will initially be focused on public rental stock backyarders and with the following estimated basic cost:

Item Description	Cost Estimate per Installation
Water connection, Sewer connection and top structure (including meter)	R13 000

The city has started the programme in Factreton which has 156 units with an estimated total cost of R2 067 780 for the water and sanitation connection. The annual maintenance cost is an estimated R1 600/unit. Although Water and Sanitation will have to plan and allow for the basic free and indigent component of the service, the programme will be driven by the City's Human Settlements Department. The targeted number of households to benefit from the programme were 135. Due to various constraints only 83 households could be serviced.The current focus area being serviced in this manner is Hanover Park, to be followed by Langa and Hanover Park.

Urban Settlement Development Grant (USDG) funding of R26 million (2011) has been provided to the Human Settlement Directorate for the backyarder strategy.

The pilot studies performed have shown that the complexity of doing backyarder servicing can vary from area to area. In some cases where there is good organization, information, and good community participation, stakeholder buy-in can happen fairly quickly, in the order of one to three months. In other cases, where substantially more ground work is required the buy-in and overcoming other social challenges can take up to six months. Thereafter delivery of at least ten units per week is possible. This reality needs to be taken into account to revise the initially proposed target of 2000 units per annum. Water and Sanitation will be responsible for the service connection to the property.

The City's Housing programme is funded through National grants. Servicing inside informal settlements is funded by the Water and Sanitation department with partial recovery of cost from the national Equitable Share. Depending on the speed of implementing this programme, as for in-situ upgrading or the "decanting" of such settlements to developed formal areas, the informal settlement programme needs to adapt.

3.4. What is the Strategy to Provide an Improved Level of Service?

Sanitation and water for an improved level of service are predominantly in the Informal Settlements and backyarders.

Backyarder policy:

A policy for the provision of services to backyarders is still to be finalised. The pilot project on Council-owned rental stock includes for the provision of backyarders with a metered water standpipe and sewer connection. . The service will be in the form of a concrete structure housing a water borne toilet on the inside, with a washing trough and tap fixed to the outside of the structure, being placed in the backyard where shack dwellings are in place .The water is connected through a water management device and a tag is allocated to each household to dispense the water. The supply to this unit will be taken off the main house supply, and all of the free portions, together with the main dwelling's free portion will be deducted from the account rendered to the main dwelling. Registered backyarders will be listed as indigent and therefore entitled to the free services that the City provides. This will put more users onto the billing system.This solution is intended to provide such households with a high level of service.

Up to and including 2011, the strategy has been to provide an improved level of service above the National Standard . Going forward it is the intention to achieve a more desirable minimum convenience ratio for each type of toilet. For example, some toilet types can only sustainably support 1 household each, while others can service more.

A revised and rationalised Informal Settlement Servicing Strategy is under development.

The technology choice and level of service to be provided in informal settlements remains a challenge. In this strategy all informal settlements are classified into categories of appropriate service standard, determined by the availability and status of land, existing infrastructure, hydrology of area and economics of providing a sustainable service. It is summarised in the following table:

Table 3: Servicing Strategy Categories within the City of Cape Town

Category	Land Type	Bulk infrastructure	Distributed space available within settlement	Service Standard
A1	Government owned land, occupation permitted	Available within economical distance.	Adequate	1
			Inadequate	2
		Not available within economical distance	Adequate	3
			Inadequate	4
A2	Private land, occupation permitted	NA (No investment on private land allowed)	Adequate	3
			Inadequate	4
B	Adverse physical conditions, temporary occupation	NA	Adequate	3
			Inadequate	4
C	Occupation prohibited	NA	Adequate	3
			Inadequate	4

No.	Desired Improved Service Level
1	Waterborne sanitation 1:5; taps 1:25
2	Managed all-in-one waterborne ablution facility with janitorial service, supplemented by portable flush toilets on demand. Incorporates taps and basins to 1:25
3	Container or dry sanitation to technology-specific household ratio. Taps to 1:25
4	Managed all-in-one conservancy tank ablution facility with janitorial service, supplemented by portable flush toilets on demand. Incorporates taps and basins to 1:25
Note	All service points to be within 100m walking distance of households served

Water and Sanitation Services are ideally opting for dehydration or flush toilets. A promising new prefabricated unit which can serve up to 17 households is being piloted, excellent for the managed ablution facility proposed. The use of pour-flush alternative technology is being discontinued due to operational problems. "Greenfields" housing projects are undertaken by the Housing Department to receive residents moved from land that cannot be developed.

The City subscribes to "the water ladder" concept (as proposed in DWA's "Strategic Framework for Water Services, September 2003"). Whereas the City's priority is to first provide an emergency

level of service to households in all settlements, it is also extending the coverage and density of services in each settlement beyond the basic level as funds allow.

Table 4: Sanitation Service Profile of all Domestic consumers, June 2012

TOILET TYPE	COUNT	HH SERVICED
INFORMAL SETTLEMENTS		
Chemical	4 716	23 580
Container	5 481	27 405
Bucket	1 108	1 108
Portable flush toilets	12 104	12 104
Pitliner	312	1 560
Dry Sanitation	187	935
Conservancy tanks	370	1 850
Dehydration (Enviroloo)	165	660
Dehydration (Afrisan)	450	450
Anaerobic	48	96
Flush	9 284	46 420
FORMAL PROPERTIES	909 231	909 231
TOTAL	**34 225**	**1 025 399**

3.5. What is the Status of All Water and Sanitation Infrastructure?

The existing infrastructure condition is deteriorating due to continued budget-constrained under-funding for essential maintenance/ replacement of aging assets in the past over several years. Major pipe collapses or bursts have occurred over the past years and such pipes are in urgent need of extensive repair or even replacement. Over the last two years, the department has succeeded in increasing its pipe replacement programme to great success, although it will take several years to reverse the trend.

An estimated minimum of R150 million/annum (over five years) and R 84 million is required for water pipe replacement and sewer pipe replacement, including for Bulk lines. For reticulation water mains the aim is to achieve an acceptable burst rate of less than 10 bursts/100km/ yr.

Key components of existing infrastructure in rapidly-developing regions of the City do operate at peak level during periods of high demand. Capacity improvements will be required to enable development. The Department has developed an Infrastructure Master Plan that identifies the Water and Sewer upgrading requirements for all development areas.

The bulk water system in the northern and northwestern corridor areas of the City is under increasing stress during peak periods due to the rapid growth in that area and further development must be accompanied by infrastructure upgrade and extension. Seawater desalination is an alternative technology being evaluated to supply water to both these regions, in addition to the proposed Bulk Water Augmentation scheme, which will provide the infrastructure to route water to this area from the Berg River Dam via large diameter bulk pipelines, a 500 Megalitre per day water treatment plant and two 300 Megalitre bulk storage reservoirs. The feasibility study for a desalination scheme is in progress and 40% of the study has been completed. The pilot for the Table Mountain Group (TMG) Aquifer is 74% complete (SDBIP, Fourth Quarter 11/12).

3.6. How will Administrative Management be Improved?

The Department is committed to consistently provide the highest quality water and sanitation services that meet and exceed the requirements and expectations of our consumers by ensuring the implementation of a Quality Management System that complies with ISO 9001:2008. To this end, both a Quality Statement and Customer Service Charter have been accepted for implementation. There is also a Department-wide ISO certification project being undertaken.

Together with the Risk Management programmes being implemented, these initiatives will ensure quality and minimise risks.

Scientific Services Branch has achieved ISO 17025 SANAS Accreditation in August 2011 for Chemistry and Hydrobiological methods. Microbiology Section envisage to accredit two methods in 2012.

The Technical Operating Centre (TOC) has achieved a certification on SANS 990 and ISO 9001:2008. This is a great achievement for the City of Cape Town as it is the first Call Centre in Africa to be certified on SANS 990.

Bulk Water has achieved a certification for all 12 of their plants on ISO 9001:2008 and will be awarded the certification on the 6th December 2012.

Water and Sanitation Training Centre has achieved its SETA accreditation in October 2012 and is currently implementing ISO 9001:2008 Standard.

The following business improvements initiatives are receiving focused attention:

The Quality Management System has been successfully developed throughout the department according to the requirements of ISO 9001:2008 Standards.

A communication protocol which addresses the communication needs with both internal and external customers has been developed and it is currently at the implementation stages.

The introduction of the shift system within some of the branches of the department is currently receiving attention and the procedures have been developed to address the needs.

Scientific Services is currently running a pilot project for the determination of the productivity standards and the Business Improvement's objective is to run it across the entire department.

Water Demand Management and Strategy is currently at the last implementation stages of ISO 9001:2008 Standard and the objective is to be certified by June 2013.

The process to improve communication from bottom up (workforce to management) was established with the use of the voice box and is currently receiving attention on how to emphasise its purpose.

The procedure on information or data integrity has been developed for the entire department and the goal is to improve the accuracy and correctness of the information or data originating from within the department and the relevant persons will be trained early 2013.

The following efficiency enhancements are receiving focused attention:

- Integration of Information Management Systems through development of a Data Integration and Monitoring System
- Integration and standardisation of Automation control and monitoring of plants via Scada-telemetry
- GIS geodatabase development for effective management and planning of the infrastructure.
- Water quality management through the Laboratory Information Management System (LIMS)
- Capacity building and training of staff
- Following the successful Automatic Metering Reading (AMR) pilot project of 1 900 consumer meters in 2010, its further rollout in industrial/commercial areas is being planned
- Adoption of an Integrated Master Plan
- An Integrated Asset Management Plan is being developed on a coordinated basis across directorates in the City, based on establishing an accurate infrastructure asset register,

maintenance and life-cycle planning, geodatabase and master data

- Integrated Risk Management and development of the staffing strategy

4. WATER SERVICES BUSINESS ELEMENT SUMMARY

4.1. Socio-Economic Profile

4.1.1. Situation assessment

In 2011 the total population of Cape Town was estimated to be approximately 3 740 025 (Census). In terms of population trends, the average annual growth rate is approximately 2.9%. This projection will be currently used to project future growth.

HIV and Aids also influence population growth, and pre-2008 trends indicate a lower mortality rate than that originally predicted. The overall trend is that Cape Town's population will continue to grow each year although at a slower rate than previous years. The number of people living in informal settlements has been growing at an increasing rate and the current housing backlog is estimated at approximately 363 000 units.

Table 4: The Socio-Economic Status Index profile of Cape Town, by Health Department districts, 2008

City of Cape Town	% Adults (20+) with highest qualification < Grade 12	% Economically Active Unemployed	% Households with income below annual threshold	Annual Income threshold	% Labour force in unskilled occupations	SES Index
1996 Census	67.07	19.55	24.66	R12 000	22.85	33.53
2001 Census	62.03	29.38	39.00	19 300	21.46	37.97
2009	49.88	24.15	34.63	42 000	19.91	32.14

Source: Strategic Development Information and GIS Department

The Socio Economic Status (SES) index and Service Level index has been used as an indicator of poverty in Cape Town. The higher the index, the greater the depth of poverty being experienced. These indexes have been regarded as an important measure of quality of life and are based on income, education, occupational status, type of dwelling and access to services.

The SES index for Cape Town rose from 33.53 in 1996 to 37.97 in 2001 and then declined to 32.14 in 2009 (see Table 5). This indicates that there may have been a decline in the general

levels of poverty in Cape Town since 2001. The biggest contributor to the decline in the index is the percentage of adults with their highest qualification less than Grade 12 and the percentage of the labour force in unskilled occupations has also declined.

Cape Town, as with most of South Africa, is faced with high levels of unemployment. But the problem of unemployment cannot be tackled in an isolated manner. Whilst the value of total employment has increased during the analysis period, unemployment has also increased. This is as a result of an increasing labour force (economically active population / job-seekers) i.e. entrants into the labour market.

It is thus important to take cognisance of current levels of unemployment as well as a growing population, specifically the working aged (15-64 years), as job creation would have to accommodate for both. The increasing unemployment rate can be further explained or monitored by the respective growth rates. Currently, Cape Town's labour force is increasing at a higher rate (1.2%) than its employment (0.4%), illustrating that not sufficient amounts of jobs is being created annually. This is evident in the even higher growth rate of unemployment (4.3%).

4.2. Future Trends, Strategic Gaps and Implementation Strategies

4.2.1. Strategic gaps:

There is a need for national guidelines on the provision of water and sanitation in the informal settlements but also to additional dwellings in backyards, for the want of which the City has developed its own.

Water and Sanitation Services aim to provide an affordable service to poor households. A free basic service is provided, in the form of the first 6 kℓ/month water supply and the first 4,2kℓ of sewerage conveyance and treatment free of charge to all consumers per month. The City is providing an indigent grant of R42/month to cover an additional water consumption of 4.5kl/month and the corresponding sewage treatment, taking the form of an account reduction to qualifying ratepayers. The number of indigent households qualifying for the Indigent grant either on a property value less than R300 000 are 184 998 as at end of October 2012, while another 2 766 (as at October 2012) qualify for the grant based on income level. The latter value fluctuates on a month to month basis and is dependent on number of applications received and number of applications which have expired.

The Water Demand Management Integrated Leaks Repair Projects, initiated at the end of 2005 and rolled out on a phased basis since then, is a major initiative to ensure that these household's plumbing leaks are minimized and that monthly bills for these services become affordable.

With the implementation of a policy to install Water Management Devices on a prioritised basis, households defined as indigent now have a mechanism to prevent water consumption reaching unaffordable levels and also prevents leaks causing high water losses. It is being installed across a range of household's income groups to the same end goal. A total of 17 556 WDM devices were installed for 2011/12.

In order to improve and maintain the condition of the infrastructure, there will be pressure on tariffs to increase at or above inflation over the short- to medium-term. This coupled with the extraordinary burden of very high national electricity tariff increases, is making it extremely difficult for the City to address all needs.

The large number of communities that have embarked on service delivery protest throughout the country has emphasised the need for the City to be transparent in dealing with the challenge of addressing needs while keeping tariffs as low as possible.

5. SERVICE LEVEL PROFILE

5.1. Situation Assessment

With respect to Domestic consumers, the latest Census of 2011, indicates a total of 1 068 575 households which including 143 823 (Census 2011) in informal settlements, while the remainder of 912 491 in the formal sector included at least 74 958 (Census 2011) backyard dwellers and 12261 households classified as other.

Across all formal registered consumer categories the City's billing system (SAP) shows 623 191 consumers (water connections) (refer to Table 6).

Table 5 No of Formal Sector Consumer Units within each Consumer category (as at June 2012)

COCT Consumer units	
Commercial	13 161
Government	316
Industrial	4 439
Miscellaneous (incl. Homeless Shelters)	5 922
School-Sportfields	1 683
Domestic Cluster	6 384
Domestic single residential	580 307
Departmental Cluster	2 681
Municipal Water	7 601
	622 494
External consumer units	
Bulk & Other	697
Total consumer units	623 191

Source of Consumer Unit breakdown: Billing system (SAP)

The formal households and other land use categories all have a metered water connection to the house or yard, with almost all households and other land use categories (excepting a few with septic tank facilities) having flush sanitation on site.

At this stage, the Backyarder policy as envisaged will only be on Council owned public rental stock and will be reviewed in years to come to include backyarders on private property in order that backyarders may have access to basic services and are not exploited by the main tenant. All registered backyarders in the programme will also be regarded as indigent. Formal domestic consumers receive the first 6 kiloliters of water per month free as well as the corresponding 4.2 kilolitres of sanitation service. Informal areas have communal standpipes and water is provided free, as is Sanitation. Both are at a lower-than desirable servicing ratio, with water much less of challenge to improve than sanitation.

The key challenge for sanitation when provided communally or shared,is maintaining and keeping it clean. A vandalized or unacceptably dirty toilet results in people using the open field which leads to safety risks particularly for women and children.

5.2. Future Trends and Goals

5.2.1. Residential consumer units

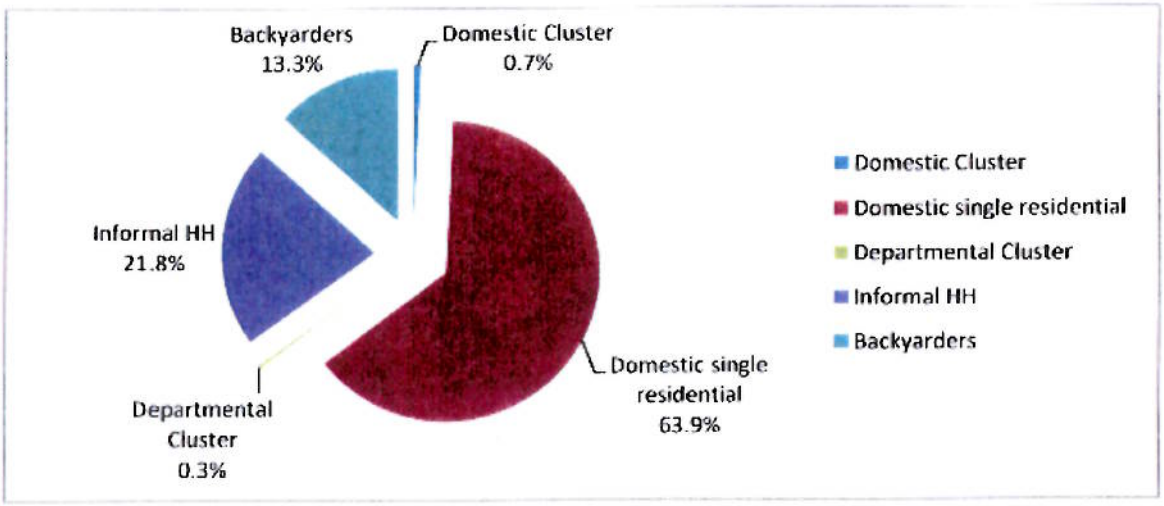


Figure 1: Breakdown of residential consumer units as at June 2012

This breakdown in residential consumers emphasises the need to focus on improved water and sanitation services on informal household consumers and backyarders. In total they make up 35% of the residential customer base.

5.2.2. Public institutions and 'dry' industries; wet industries; industrial consumer units

All have connections on-site.

5.2.3. Strategic gaps

- The need for an improved level of service with informal settlements and backyarders.
- With respect to the effluent discharged from Industrial sites, non-complying and polluting trade effluent occasionally impacts heavily on the wastewater treatment process serving the catchment. The size and efficiency of the inspectorate has been increased over the past few years, while Water, Sanitation and Effluent By-laws have been consolidated and rewritten for the City. Nevertheless the challenge to obtain cooperation from consumers remains high.

5.2.4. Implementation strategies

- Residential consumer units: Water & Sanitation's informal settlement programme aims to provide an improved level of water and sanitation service and maintain a minimum level of service to poor households.
- Industrial consumer units: The inspectorate is using an engaging, cooperative approach with consumers, more comprehensive integrated by-laws as well as more frequent inspections and measurements to improve the quality of industrial effluent, prevent pollution in a pro-active manner and reduce water wastage.

6. WATER RESOURCE PROFILE

6.1. Situation Assessment

6.1.1. The Western Cape Water Supply System

The Western Cape Water Supply System (WCWSS), comprising raw water storage and conveyance infrastructure, supplies water to Cape Town, surrounding towns and urban areas and agriculture. The various components of the WCWSS are owned and operated by the COCT, DWA and Eskom.

The COCT and DWA operate the WCWSS in an integrated manner to ensure that the storage of water is maximized and spillage is minimized during current and future hydrological years.

The annual yield of the WCWSS, including the recently completed Berg River scheme, is 556 million kl per annum.

The major raw water supply schemes of the WCWSS are the Riviersonderend, Voelvlei and Berg River Schemes, owned and operated by the DWA, and the Wemmershoek and Steenbras Schemes, owned and operated by the City of Cape Town. The total storage capacity of the six major dams on as at June 2012 is 898 300 million kl, only 57% of total storage capacity is occupied.

Table 6: Major Dam Levels

MAJOR DAMS 99.6% of the total system capacity	BULK STORAGE ON 25 JUNE 2008 – 2012						
	CAPACITY MI	CAP. LESS DEAD STORAGE	% 2008	% 2009	% 2010	% 2011	% 2012
Wemmershoek	58 644	58 544	64.3	74.7	69.4	72.1	48.0
Steenbras Lower	33 517	33 517	58.5	64.7	63.9	58.3	53.2
Steenbras Upper	31 767	29 267	74.7	94.2	79.6	59.8	74.1
Voelvlei	164 122	156 022	62.7	76.8	81.7	62.0	46.5
Theewaterskloof	480 250	432 250	78.6	92.3	85.6	71.6	57.0
Berg River	130 000	125 800		73.1	100.3	79.2	71.0
TOTAL STORED			561 514	760 015	762 852	629 478	511 763
TOTAL STORAGE	898 300	835 400	768 300	898 300	898 300	898 300	898 300
% STORAGE			73.1	84.6	84.9	70.1	57.0

The six major dams comprise 99.6% of the total system capacity. The percentages in the above table include "dead storage" (water that is not available for use). The approximate dead storage for each dam is indicated in the table. A long-term 17 year record of the storage level of the WCWSS is shown below.

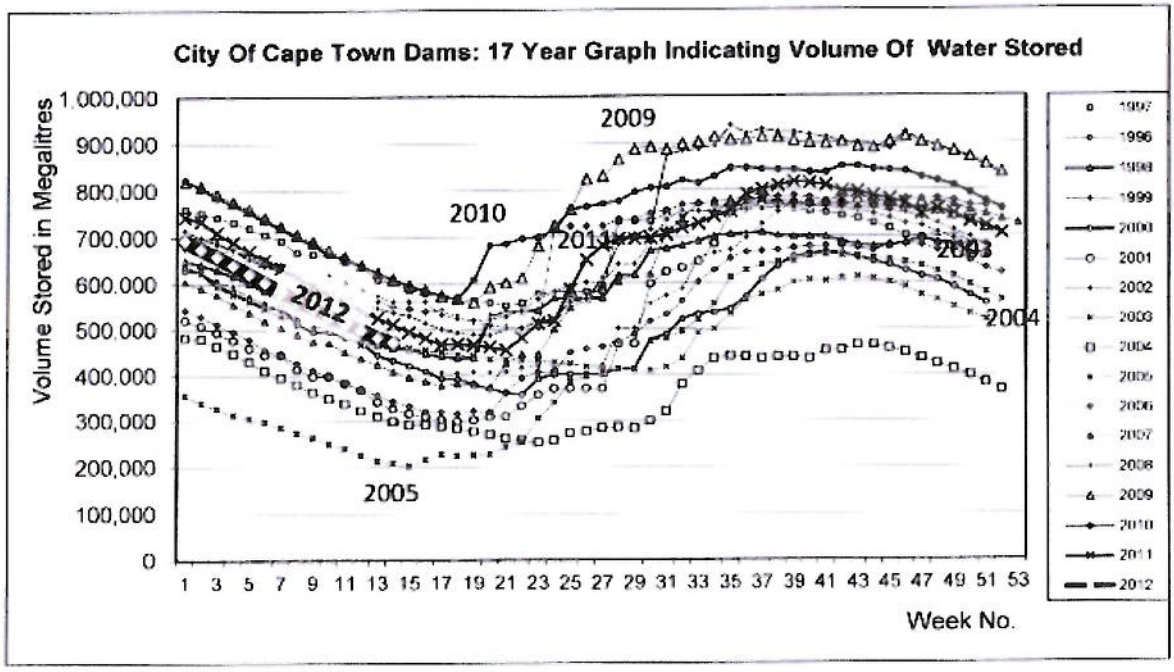


Figure 2: 17 year long term history of reservoir storage capacity

6.1.2. Water resources supplying Cape Town

The COCT's allocation of water from the WCWSS, with the additional yield of the Berg River scheme, is 398 million kl per annum. Including the Berg River scheme, the COCT obtains 74% of its allocated water from DWA owned sources, with the balance of 27% from COCT owned sources. The resources supplying the COCT and its allocation from these resources are shown in Table 7.

The COCT produced 330.04 million kl of potable water during the 2011/12 financial year.

6.1.3. Water returned to the resource

The COCT obtains most of its raw water from mountainous catchments outside of its municipal area, and therefore most of the COCT's treated wastewater effluent is not returned to the raw water resource. A percentage of the effluent produced at the Westfleur Treatment Works at Atlantis is used to artificially recharge the aquifer from which water was abstracted for potable supply as part of the Atlantis Water Supply Scheme.

Table 3: Cape Town's allocation from the WCWSS

	Volume (Million kl/annum)	% of Total
DWA Owned Schemes		
Theewaterskloof	118	29.6%
Voëlvlei	70.4	17.7%
Palmiet	22.5	5.6%
Berg River	81	20.3%
Subtotal DWA Schemes	**291.9**	**73.2%**
COCT Owned Schemes		
Wemmershoek	54	13.5%
Steenbras	40	10.0%
Lewis Gay and Kleinplaats Dams	1.8	0.5%
Land en Zeezicht Dam	1	0.3%
Table Mountain Dams	3.5	0.9%
Albion Springs	1.5	0.4%
Atlantis Groundwater Scheme	5	1.3%
Subtotal COCT Schemes	**106.8**	**26.8%**
Total Allocation	**398.7**	

6.2. Quality of Water

The quality of water produced at the COCT's water treatment plants is strictly monitored on a continual operational basis by the Bulk Water Branch to ensure compliance with the South African National Standard (SANS 241:2011) on drinking water quality. The Scientific Services Branch also conducts routine sampling and analysis of potable water produced at all water treatment plants, as well as inspection of treatment processes.

SANS 17025 certification for the laboratory quality testing has been attained in September 2011. Expansion of the laboratory is a necessity for improving its capability to undertake a wide spectrum of tests.

The water quality report below indicates the analytical data and approximate distribution for Cape Town drinking water for June 2012. The SANS Specification is also stipulated on this report. Water Compliance has exceeded the target of 96% at 98.6% (4th Quarter SDBIP, 11/12).

Table 4: Class 1: Drinking Water Quality for June 2012 (SANS 241 requirements per population size; 1 sample: 20 000 population)

Water Supply Outlets	Sample Points Per Water Supply Outlet	Sample Points Sampled	Number of Samples Taken for May		% Compliance SANS 241			
					May Month		12 Month Rolling Average	
			Chemical	Microbiological	Chemical	Microbiological	Chemical	Microbiological
Water Treatment Plants	10	9	32	28	99	100	99	99
Reservoir *	26	23	76	86	100	100	98	99
Distribution *	107	90	333	352	100	100	98	100
Informal Settlements *	43	35	67	64	100	98	98	98
Total	186	157	508	530	100	100	98	99

6.3. Future Trends and Goals

The Department will continue to take steps in order to meet the requirements for any future water quality standard increases. The international and national specifications for drinking water are changing all the time with specifications becoming more stringent and with new ones being added

such as for. possible future water analysis for radioactivity, viruses or EDC's. Necessary measures may include the purchase of new specialized analytical equipment to perform these measurements or stricter process control at the water treatment plants. With proper coordination within the Department, these future water quality requirements can be met.

6.3.1. Strategic gap analysis

The WCWSS Reconciliation Strategy included recommendations of interventions, listed in table 10 below, that needed to be implemented or studied further to ensure that potential schemes could be implemented in future when required.

Table 5: Interventions to be implemented or studied further

Intervention	Study Level Required	Responsibility
Existing Feasibility Studies in Progress		
Water Demand Management	Intervention to be implemented	COCT
TMG Aquifer Feasibility Study	Feasibility	COCT
Desalination Feasibility Study	Feasibility	COCT
TMG Regional Monitoring	Monitoring	DWA
Invasive alien plant clearance	Ongoing	DWA
Voelvlei Phase 1	Update feasibility	DWA
Mitchell's Pass Diversion	Pre-feasibility/feasibility	DWA
Raising Steenbras Lower Dam	Pre-feasibility	DWA
Water Re-use	Pre-feasibility	DWA/COCT
Future Studies Required		
Newlands Aquifer	Pre-feasibility	COCT
CapeFlats Aquifer	Feasibility	COCT
LourensRiver Diversion Scheme	Pre-feasibility	COCT

The timing of the development of the required bulk water infrastructure is dependent on the growth in water demand compared to the effectiveness of the Water Demand Management (WDM) Strategy. To ensure security of supply, the City of Cape Town, in consultation with the Department of Water Affairs (DWA), is exploring the next water resource scheme to be developed by 2019. The most probable scheme in the order of economic priority is the raising of Voelvlei dam (DWA),

wastewater reclamation, groundwater (TMG Aquifer) and desalination. The desalination study is currently underway, the water reclamation study will commence soon and the pilot for the groundwater (TMG) extraction will also be commencing soon. In addition, the City of Cape Town will increase the treatment and conveyance capacity of the bulk water supply to enable optimum utilization of the existing water resource capacity created by the construction of the Berg River Dam. To this end, the Bulk Water Augmentation Scheme (BWAS), which entails the construction of Muldersvlei Treatment Plant (500 Ml/day), reservoirs (600Ml) and conveyance bulk pipelines (56km), is under planning and design.

6.4. Regulation

6.4.1. Situation assessment

The Water Pollution Control Inspectorate's function is the protection of municipal infrastructure and the environment against pollution. Most of the inspectors are Peace officers, who regulate public institutions and the industrial/commercial sector.

About 300 dischargers are monitored on a monthly basis, and for the 2011/12 financial year, an average of 10% of these were non-compliant. Between July 2012 and June 2012, 150 fines were issued for illegal discharges to storm water and five for treated effluent contraventions.

The Wastewater & Industrial effluent by-law has been amended and is advertised for public comment. Previously there were no fines for the Treated Effluent and the Wastewater & Industrial effluent by-law, but recently spot fines have recently been approved by the Magistrate committee and effective immediately. A process has been developed, approved and implemented to handle section 54 and 56 notices issued under the criminal procedure Act. This will enhance the enforcement arm of the unit.

6.5. Future Trends and Goals

6.5.1. Strategic gap

With respect to the effluent discharged from Industrial sites, non-complying and polluting trade industrial effluent occasionally impacts heavily on the wastewater treatment processes serving the catchment and as a result, poor quality effluent ends up being discharged into our rivers.

Parameters of concern for in the sewer system include fats, other foreign objects (sand, tools, tyres, rags, etc.), toxic substances and stormwater ingress. In the case of the stormwater system, the common offence is mainly polluted wash water containing oils, silt and grease from vehicle washing.

6.5.2. Implementation strategies

Industrial consumer units: The inspectorate is using an engaging, cooperative approach with consumers, more comprehensive integrated by-laws, as well as more frequent compliance monitoring inspections and measurement and enforcement in the form of fines and full legal processes where needed.

This approach is crucial in achieving our goal to improve the quality of industrial effluent discharged into the sewer system, prevent pollution in a pro-active manner and reduce water wastage.

A campaign on educating the communities (all sectors) around sewer blockage causes, consequences and prevention is continually rolled out and is currently underway in phases across the city as a means to protect the infrastructure and the environment against pollution. In addition to the education and awareness program, there is an on-going infrastructure replacement/and refurbishment programs. Furthermore, the unit Inspectorate is also in the process of appointing consultants to install an in-line monitoring tool/system to assist in enhancing the continuous quality monitoring of industrial effluent, in particular form from the metal finishers finishing sector, in order to prevent or promptly respond to illegal discharges.

As far as the storm water ingress challenge, services of consultants have been sought to assist with detailed investigations on above and below ground sources responsible for the stormwater ingress to sewer so that plans to deal with such can be put in place.

A contractor was appointed to investigate the stormwater ingress in the Helderberg and Strand area for a period of three years. The current progress on the project includes the measuring of flow within the sewer system and analyses of the flow data, including pumpstations, to determine the areas where site inspections should take place.

7. WATER CONSERVATION AND DEMAND MANAGEMENT

7.1. Water Demand Management Interventions

7.1.1. Situation assessment

The efficient use of scarce water resources for the City of Cape Town's growing needs and the aim to maximize on the use of existing infrastructure are critical factors that drive the Water Demand Management and Water Conservation Strategy.

The Department is applying the resources required to implement water demand management interventions, including: (a) reduction of non-revenue water, (b) reduction of high pressure, minimum night flow for residential consumers, (c) education programmes, (d) plumbing leak and meter repair programmes, (e) pipe replacement, effluent re-use, water restrictions and stepped tariffs.

7.1.2. Trends and goals

Water demand management is an essential core requirement for sustainability of water supply to the City. In circumstance where water consumption is controlled to the levels expected in the Water Conservation and Water Demand Management strategy, deferment of the next water resource scheme to approximately 2029 can be achieved.

In the 2011/12 financial year, a number of successful WC/WDM projects were implemented, of which notable projects were:

- Pressure Management for which savings are estimated at 2.28 Ml/day, successfully installed in Goodwood, Monte Vista, Bishop Lavis/Bonteheuwel, Thornton, Plumstead/Retreat, and Kalkfontein
- Water meters replaced 4 804
- Water meters re-fixed/relocated 3 468
- WDM Devices installed 17 556.

7.1.3. Strategic gaps and goals

Table 6: Strategic Gaps

Resources	Inadequate financial resources
	Inadequate human resources to implement WC/WDM strategy
	Water balance not developed to IWA standard.
Technical capacity and tools	Ineffective management information and monitoring systems
	Inadequate demand measurement systems and tools
	No detection programme in place to identify water leaks before they become bursts
	Water balance model not yet developed to level of all water supply zones

Demand reduction has been planned for a level of no more the 2% growth. This target has been far exceeded by a measured -1.8% (negative growth/reduction in water demand) for 2011/12 financial year. If funding on WDM is not continually prioritised to enable the planned programmes, the factors of economic growth and consumer behaviour will outstrip the gains made.

7.1.4. Implementation strategy

The Water Conservation and Water Demand Management Strategy are being followed in order to budget for and implement several initiatives in parallel. The Strategy is currently being reviewed in terms of its level of success and updated accordingly.

Top priorities are the rollout of further Water Demand Management Devices on a prioritised suburb-by-suburb basis.

Further pressure reduction schemes are being designed for implementation.

The Automated Meter Reading Pilot installation on consumer meters has been finalised. Decisions on future roll-out options City-wide will follow and be considered for future budgets on a priority basis. Advantages indicated by preliminary evaluation include:

- synchronised simultaneous reading for an entire suburb
- more reliable readings with far fewer estimations
- Immediate loss detection at a consumer
- Immediate knowledge of a meter failure or tampering
- the ability to analyse water balance and losses by individual supply zones

8. WATER SERVICES INFRASTRUCTURE PROFILE

8.1. Infrastructure Profile

8.1.1. Situation assessment

The Financial or "book" value of the water and sewer infrastructure stood at R3.17 billion as at 30 June 2012. However, the Replacement Value is estimated considerably higher, escalated at CPIX rates from a 2003 Independent Auditing evaluation.

Table 7: Infrastructure of Water and Sanitation Services -Estimated Replacement cost

Description	Asset Count	Repl Value (R M)	Annual Maint Norm	Annual Maint req, Bulk Water seperate(R M)
Bulk Water (including water pump stations, water retic and reservoirs)				48.6
Dams and Catchments	11 No	1 672.0	0.50%	8.4
Water Treatment Works	12 No	1 856.0	1% Civil, 4% Mech/Elec	92.8
Waste Water Treatment Works incl three Sea Outfalls and two oxidation ponds	27 No	1 420.1	1% Civil, 4% Mech/Elec	71.0
Water Reticulation (incl Bulk Lines) (as at end of June 2012)	10 805.4	17 615.0	1%	176.2
Sewer Reticulation (as at end of April 2012)	8 752.1	11 715.0	1%	117.2
Depots	21 No	58.8	0.50%	29.4
Water Pump Stations (only reticulation)	82 No	821.0	0.5% Civil, 4% Mech/Elec	36.9
Sewer Pump Stations	377 No	853.0	0.5% Civil, 4% Mech/Elec	38.4
Reservoirs (Includes bulk water reservoirs (24) and Reticulation tanks (98))	122 No	2 783.0	0.50%	13.9
		38 793.9		632.7

8.1.2. Trends and goals

The water supply and wastewater reticulation networks jointly account for 72% of the total replacement value. The water distribution networks experienced 3 957 bursts to water mains in 2011/12 compared to 6 523 in 2010/11..

8.1.3. Strategic gaps

Historically, maintenance of infrastructure was mostly reactive. This is evidenced by the list of overdue maintenance and replacement projects.

Especially in the City's growth areas the water and sewer infrastructure are severely stressed:

- West Coast / Parklands development corridor
- De Grendel / N7 development node
- Northern development/Fisantekraal corridor
- Bottelary development corridor
- Fast-track housing projects (e.g. N2 Gateway)
- Maccassar / AECI development node

The strong growth trend in the City is making it difficult to maintain a balance between requirements for new services and available resources.

8.1.4. Implementation strategies

The City has undertaken an accelerated programme to improve the replacement of water distribution network mains, especially in areas that experience a high incidence of bursts, such as the Tygerberg district. More importantly, Water and Sanitation Services is implementing an Asset Management Programme (AMP). This will ensure that:

- Assets are maintained proactively rather than reactively,
- The total asset lifecycle is managed to maximise life of asset,
- Maintenance work is effectively coordinated,
- Operational downtime is significantly reduced.

The strategies for ensuring that wastewater treatment capacity is maintained include:

- Integrate planning for new works and extensions with the other branches and ensure that additional wastewater treatment capacity is provided where needed at the right time,
- Provide sufficient funding (EFF and MIG funds) to address the backlog in WWTW capacity and provide for growth.

The Water and Sanitation Department is focusing on growing its 'asset management maturity' with the implementation of a Strategic municipal Municipal Asset Management (SMAM) programme. This is facilitated through reliability engineering (formerly known as an Asset Care Centre or ACC).

To ensure long term sustainability, Water and Sanitation Services has by 2010 developed an Integrated Master Plan. The objectives of the master planning process are:

- To balance demand and capacity, all water and sanitation branches will use the same base

data, assumptions and design parameters to ensure consistency,

- Infrastructure plans within Water and Sanitation Services are fully aligned,
- Alignment with the City's Spatial planning and IDP strategies are achieved,
- To provide sound information on which capital budgets for future years can be improved, and
- The plan is kept up to date annually to ensure reliable planning based on it.

There is intention to offset the disadvantages of the existing sprawl of the CoCT with reference to infrastructure by concentrating development in identified densification zones / corridors.

In line with the IDP Focus Area of infrastructure led development and economic growth the WSDP will:

- Focus on maintaining and replacing aging existing infrastructure
- Improve delivery of services to informal areas, and
- Promote efforts to densify the city by reviewing and upgrading infrastructure to accommodate higher residential density.

Among others, the following major WWTW upgrade projects will be undertaken during the next five years:

- Athlone – 15 Mℓ/day capacity extension
- Wesfleur – increase capacity
- Macassar – extension
- Cape Flats – refurbish various structures
- Potsdam – extension
- Zandvliet – extension
- Greenpoint Sea Outfall – investigation into need for flow attenuation

For the reticulation network of both water and sanitation, the following network upgrades will inter alia be undertaken during the next five years:

Water Network

- Replacement of and upgrades to the water network citywide

- Informal settlement water installations

Sanitation Network

- Khayelitsha sewerage network upgrades
- Rehabilitation of outfall sewers in Pentz Drive and Sandrift

An automation, monitoring and technology programme is being driven in the department towards achieving maximum efficiency and optimum utilisation of staff resources in a "smart" way. To this end, cooperation has been pursued with leaders in the field such as the Norwegian Oslo Waterworks and the Danish Hydraulic Institute.

Table 8: Automation, monitoring and technology Framework plan

ACTION	PROGRESS	TIMEFRAME	IMPLEMENTATION COST
Plant SCADA upgrades (Bulk, Wastewater, Pump stations)	SCADA upgrades completed at Atlantis, Blackheath and Steenbras WTP. Visnet implemented Software and partial commissioning at Wildevoelvlei WWTW Additional license required and connection to corporate network. And Wemmershoek Dam WTW. Complete	5 years (2014)	R10M for current Reticulation system phase. Full system scope being developed
Bulk & Zone meter automation	Further zones delineated (201) and zone meters installed	All Water Zone meters logged by 2014	
Customer meter automation	AMR pilot installation completed May 2010. Extensive evaluation undertaken in N2 Gateway, SunsetBeach and Epping Industria. Various technical, meter supply and process issuesaddressed Prepayment meters to be investigated and piloted	AMR Phased rollout planned in priority industrial or commercial areas over a multi-year timeframe (2020) for entire City. Prepayment pilot 2011	R1.5M pilot phase R50M excluding meter replacement
Integrated Information System	DIMS development (Danish Hydraulic Institute) with major DWA grant completed. Integrates key major Water and Sanitation information systems in browser map-based dashboards	Completed and handover October 2010	R7M (R5M DWA grant)
Integrated Master Planning: A tender evaluation is currently underway to appoint a service provider who transfer skills to City of Cape Town staff. An appointment is expected to be made within the next 4 weeks and the appointment is intended to cover 3 financial years	Training and skills transfer in the practical updating of the IMP is expected to be completed by June 2015	The tender was designed as a rates only tender but the estimated cost for the project is between 10 and 13 million over the 3year period	A tender evaluation is currently underway to appoint a service provider who transfers skills to City of Cape Town staff. An appointment is expected to be made within the next 4 weeks and the appointment is intended to cover 3 financial years
Technical Operating Centre process improvements	SAP-GIS integration being implemented under control of SAP. Includes: GIS & SCADA integration in SAP, C3 Notifications, Tetra Radio comms and spatial tracking. Mobile Asset Management	2012	R10M
SCADA/Telemetry masterplan	Contract has been awarded to develop a new master station for all reservoirs and pump stations, including the supply of RTUs. Also included is the development of data from the new telemetry system to the database that DIMS will harvest		

ACTION	PROGRESS	TIMEFRAME	IMPLEMENTATION COST
	Tender in place for the procurement of RTUs Factory Acceptance Test complete snag list being resolved Test RTU in field trials • Central SCADA system installed • 500 RTUs procured under a tender • 80 Installed, 26 commissioned and handed over	2012	
Automated Water Analysis	Process lab Units already installed at 9 Bulk Water Depots Installation of 8 computers and Connectivity testing to be in March 2010.	Completion end March 2010.	R693 000
Air Quality Monitoring System (Service provider to Health Dept)	Tender awarded April 2010.	Completed 2010	R1.3 Million

9. WATER BALANCE

9.1. Water Losses and Non-Revenue Water

9.1.1. Situation assessment

Using water and billing figures, the unaccounted-for water (UAW) for the overall supply system from Bulk Water Treated to end consumer billing is 15.3% (2011/12).

The Non-Revenue Water (NRW) is defined as the volume of water used by the municipality for which no income is received where revenue water includes Free Basic water which is billed at a zero rate (Wegelin *et al*). Below is the Non-revenue Water balance according to IWA standard.

9.1.2. Future trends and goals

The City has in principle adopted international best practice with respect to reporting on water balance and will stop reporting on UAW as soon as more accurate data is available.

9.1.3. Strategic gap analysis

The SABS 0306:1999 standard discourages the use of percentage losses to quantify water losses in the distribution network.

Table 9: Non-revenue water demand, 2011/12 Financial Year

<table>
<tr><td rowspan="11">System Volume Input
904.22
Ml/day</td><td rowspan="3">Authorised Consumption
765.75
Ml/day</td><td rowspan="2">Billed Authorised Consumption
719.18
Ml/day</td><td>Billed metered consumption
719.18
Ml/day</td><td rowspan="2">Revenue Water
719.18
Ml/day</td></tr>
<tr><td>Billed unmetered consumption
0 Ml/day</td></tr>
<tr><td rowspan="2">Unbilled Authorised Consumption
46.57
Ml/day</td><td>Unbilled Metered Consumption
37.08
Ml/day</td><td rowspan="9">Non Revenue Water
185.04
Ml/day

(20.5% of Input Volume)</td></tr>
<tr><td>Unbilled Unmetered Consumption
9.49
Ml/day</td></tr>
<tr><td rowspan="8">Water Losses
138.48
Ml/day

(15.3% of Input Volume)</td><td rowspan="2">Apparent Losses
54.56
Ml/day</td><td>Unauthorised Consumption
9.04
Ml/day</td></tr>
<tr><td>Customer Meter Inaccuracies
45.52
Ml/day</td></tr>
<tr><td rowspan="6">Real Losses
83.91
Ml/day</td><td>Leakage on Transmission and Distribution Mains
83.03
Ml/day</td></tr>
<tr><td>Leakage on Overflows at Storage Tanks
0.88
Ml/day</td></tr>
<tr><td>Leakage on Service Connections up to point of customer meter
Negligible</td></tr>
</table>

Note: Free basic water (as part of the Revenue Water) equates to 136.38Ml/day as at 2011/12 financial year (billed at a zero rate).

9.1.4. Implementation strategies

A very high priority is being given to a comprehensive Water loss reduction strategy with detail action plans being developed for each of Technical losses (Pipe bursts, Leakage, Treatment losses, System losses), Apparent losses (illegal connections, metering inefficiencies, unmetered authorised consumption, unauthorised consumption, Billing/accounting, meter reading).

Phased Installation of more zone- and bulk supply meters are being implemented as well as automated remote logging thereof to accurately measure input into water supply zones.

An added benefit of the Integrated Master Plan project is the creation of an accurate and up-to-date historic record of consumption by individual properties that can be used to derive water and sanitation demands. The first comprehensive and reliable dataset became available in January 2010. This data updated regularly, will be used together with zone meters and bulk meters to achieve a water balance based on smaller pressure zones. This will enable losses to be pinpointed and reduced or eliminated.

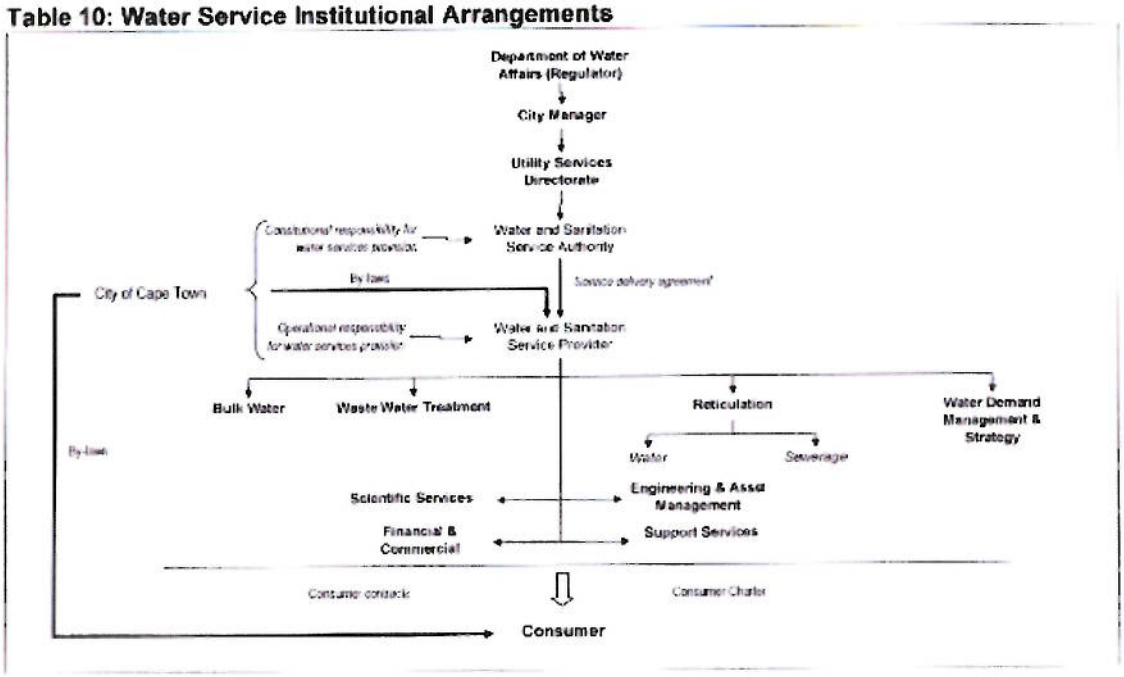
The DIMS project recently implemented has, as a focus area, the reporting of the latest Demand and Loss information as per the IWA standard.

10. WATER SERVICES INSTITUTIONAL ARRANGEMENTS

10.1.1. Situation Assessment

The new City of Cape Town and the Water and Sanitation Services entity was formed with the amalgamation of the Cape Metropolitan Council and the 6 metropolitan local councils in December 2000.

Table 10: Water Service Institutional Arrangements



Source: Water Demand Management Strategy

On 28 November 2001, Council authorized Water and Sanitation Services as it was called then to operate as fully-fledged and functional internal business unit in order to ensure maximum independence and minimum constraints. In practice this has not been implemented further and the service is now housed in the Utility Services Directorate as the Water and Sanitation Department.

10.2. Future Trends and Goals

The appointment and retention of technical staff (engineers, scientists and IT personnel) remains a high priority.

10.2.1. Strategic gap analysis

The City of Cape Town is currently undertaking the constitutional responsibility for water service provision (as the Water Services Authority (WSA)) as well as the operational responsibility (as the Water Service Provider (WSP)). The City has not separated the service authority and service provision function to establish a municipal entity, preferring to operate the service as an internal ring-fenced department. At the moment, there is no service delivery agreement between WSA and WSP in place.

10.2.2. Implementation strategies

Institutional reform: The City's strategic intent, aligned with the national agenda and as stated in the IDP is:

- Sustainable use of scarce resources such as water
- achieving operational, financial and other efficiencies which will enhance equitable, affordable and effective service delivery and sustainable development;
- Increase service provision (taps and toilets in formal settlements)

Human resources: It is the City's strategic intent to develop and retain a skilled and motivated staff according to the Staffing Strategy and the Workplace Skills Plan. A strategy to hold onto staff is a talent management programme currently underway which intends to hold onto qualified and experience staff through a career development and succession plan. This effort will help to hold onto institutional knowledge.

11. CUSTOMER SERVICE PROFILE

11.1. Situation Assessment

Although under stress in certain regions, necessary infrastructure is in place to ensure an adequate quality of service to all households. All customers receive water that is fully treated. There are mechanisms in place to attend to customer complaints and queries.

A survey is undertaken on an annual basis to gauge the customer satisfaction in formal domestic, informal domestic and business sectors and to identify specific issues of concern.

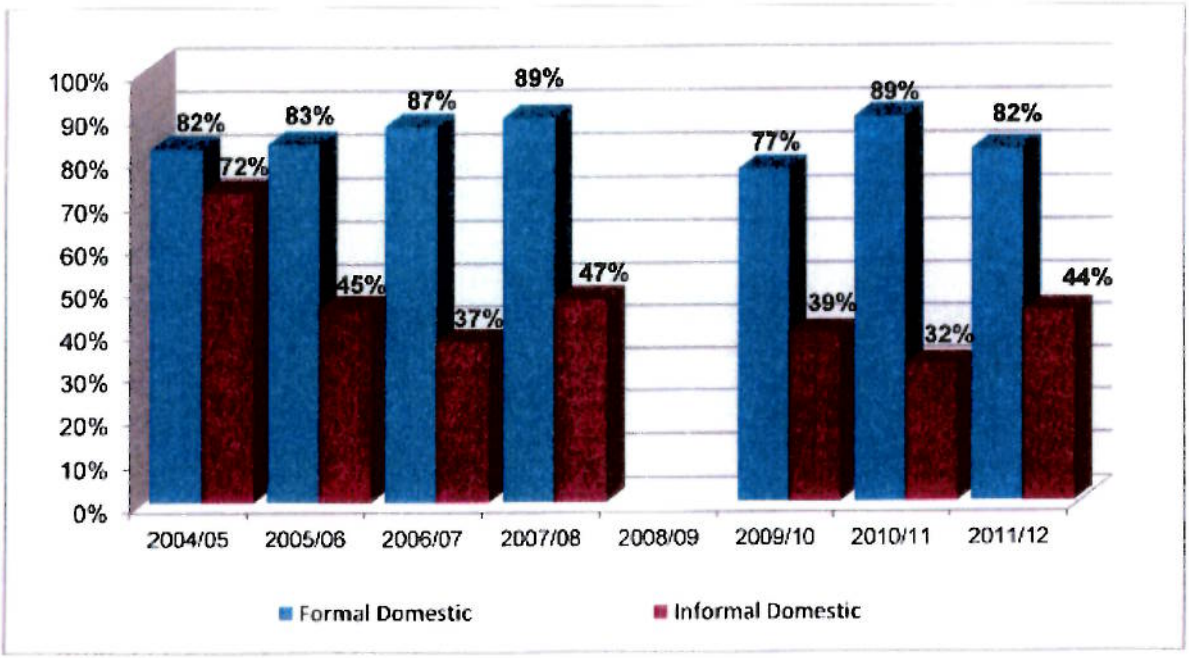


Figure 3: Customer satisfaction levels over time

The general conclusions are:

- The increasing satisfaction level for respondents living in formal residential areas has shown a downturn.
- Respondents living in informal residential areas are generally dissatisfied.
- 82% of business respondents are satisfied.

This could be an indication that residents do not understand the reasons for a basic level of service as opposed to a full level of service. An alternative argument could be that people whether in a formal or informal settlement, will only be satisfied with a full level of service and that the level of satisfaction in informal settlements will always remain low due to problems related to communal toilets.

11.2. Future Trends and Goals

The goal is to ensure that the percentage of customers satisfied with the service continues to increase and reaches 95% within the next 5 years.

11.2.1. Strategic gap analysis

There is no consolidated information on response times to complaints and queries and to repairing

water and sewer mains. An integrated information system dealing with these matters is under development by the Technical Operating Centre.

11.2.2. Implementation strategies

- Ensuring water pressure standards are maintained to improve areas of extreme high or low pressures.
- The Education and Awareness Campaign will be extended to affect behaviour change in residential customers towards reducing water consumption, and that all customers have a better knowledge of water efficient fittings.
- Establishment of a system at the Technical Operating Centre to ensure that customer complaints are measured and followed up.
- The AMR project promises to bring improved customer satisfaction around metering and billing.
- Appointment of staff for critical vacancies.
- Have a public awareness on level of service and affordability
- The survey question in informal settlements should be structured differently

12. FINANCIAL PROFILE

12.1. Situation Assessment

12.1.1. Capital expenditure and sources

Capital expenditure incurred during the year 2011/12 amounted to R605.2 million with an expenditure level reached against the current budget.

Table 11: Water and Sanitation capital expenditure 2011/12

Area (R'million)	2009/10	2010/11	2011/12
Bulk Water	25.2	19.2	17.0
Reticulation	219.6	149.6	216.3
Wastewater Treatment	235.5	121.5	223.2
Water Demand management	8.9	14.6	24.7
EAMS	26.2	36.9	62.6
Informal Settlements	24.8	21.1	28.4
Meter Replacement	9.90	14.6	12.3
Information Technology	8.90	7.3	12.7
Technical Operation Centre	5.90	1.1	2.8
Master planning	3.90	0.4	0.1
Other	2.2	4.6	4.9
TOTAL	**571.0**	**390.9**	**605.2**

Capital expenditure is financed from

(i) CRR (Capital Replacement Reserve) a fund replenished from surplus in previous financial year,

(ii) EFF (External Financing Funds) loans obtained by the City, attracting interest and depreciation charges and having a direct impact on the tariffs or

(iii) CGD (Capital Grants & Donations).

12.1.2. Operating costs and income

In 2011/12 operating costs amounted to approximately R4.9 billion and a deficit of some R45million. The deficit can mainly be contributed to the increasing expenditure commitments required for operations.

12.1.3. Tariffs and charges

Table 12: Water and Sanitation tariffs trends

WATER TARIFFS (Rands)	2008/09	2009/10	2010/11	2011/12	2012/13
Domestic Full: 0-6 kℓ	-	-	-	-	-
+6-12 kℓ	3.33	3.66	na	na	na
+6-10.5 kl	na	na	3.99	4.32	5.83
+12-20 kℓ	7.10	7.81	na	Na	Na
+10.5-20 kl	na	na	8.51	9.22	10.60
+20-40 kℓ	10.52	11.57	na	Na	Na
+20-35 kl	na	na	12.61	13.66	15.70
+40-50 kℓ	12.99	14.29	na	Na	Na
+35-50 kl	na	na	15.58	16.87	19.40
+50 kℓ	17.14	18.85	20.55	22.25	25.58
Domestic cluster: >6kl	7.12	7.83	8.62	9.33	n/a
+6-20 kℓ	n/a	n/a	n/a	n/a	9.07
+20 kℓ	n/a	n/a	n/a	n/a	17.55
Commercial	7.59	8.35	9.18	9.93	11.42
Industrial	7.59	8.35	9.18	9.93	11.42
Schools/sport	6.70	7.37	8.11	8.78	10.09
Government	7.20	7.92	8.71	9.43	10.85
Municipality	6.70	7.37	8.11	8.78	10.09
Miscellaneous	7.20	7.92	8.71	9.43	10.85
Misc (external)	8.60	9.46	10.41	11.27	12.96
Bulk Tariff	2.59	2.59	2.85	3.02	3.22
SANITATION TARIFFS (Rands)					
Domestic Full:0-4.2 kℓ	-	-	-	-	-
+4.2-8.4 kℓ	4.01	4.29	na	na	na
+4.2-7.35 kl	na	na	4.67	5.05	5.81
+8.4-14 kℓ	8.52	9.12	na	Na	Na
+7.35-14 kl	na	na	9.94	10.76	12.38
+14-28 kl	9.32	9.97	na	Na	Na
+14-24.5 kl	na	na	10.87	11.77	13.53
+28-35 kℓ	9.78	10.46	na	Na	Na
+24.5-35 kl	na	na	11.41	12.36	14.21
Industrial & Commercial	5.99	6.41	7.05	7.63	8.78
Departmental/Municipal	5.51	5.90	6.49	7.03	8.08
Domestic Cluster (>4.2 kℓ)	9.65	9.65	9.65	10.45	n/a
+4.2-14 kℓ	n/a	n/a	n/a	n/a	9.05
+14-35 kℓ	n/a	n/a	n/a	n/a	15.04

Tariff increases have been set higher than inflation during the last number of years due to the escalated focus on repairs and maintenance of current infrastructure as well as the growth in the capacity requirement in the capital infrastructure programme.

As we get closer to requiring an augmentation scheme, the tariffs will have to be reviewed in order to cover costs of augmentation. This awareness that we will constantly be faced with a decision of when, what method and cost of any scheme that will be implemented.

12.1.4. Free basic water and sanitation

The first 6 kilolitres of water supplied to all residential dwellings in the municipal area and the first 4.2 kilolitres of sewage removed from all residential dwellings in the municipal area is free. Fixed charges do not apply to dwellings occupied by domestic households.

A R42 Indigent Grant is applicable to the water and sanitation tariff for qualifying households. The net result is that an Indigent household can consume an additional 4.5kl water per month and can discharge an additional 3.15 kilolitres wastewater per month (with sewerage disposal 70% of water consumption) without attracting any charges.

This subsidy would be ineffective without the ongoing Integrated Leaks Repair and Fixit Projects aimed at repairing leaks, reducing consumption, reducing monthly bills and eliminating arrears of properties occupied by Indigent households. (Refer to the Water Conservation and Demand Management Strategy.)

12.2. Trends

The Operating budget will increase in line with the City's Medium-Term Revenue and Expenditure Framework (MTREF). This reflects the need for increasing demands to repair and maintain current infrastructure and the requirement of resources to operate new infrastructure. Consequently, there is pressure on annual tariffs increases to exceed inflation.

The long-term Capital budget requirement is summarised Table 17.

Table 13: Long-term Capital requirement for 10 years from 2013/14

	Revised Provision 2013/14	Revised Provision 2014/15	Revised Provision 2015/16	Revised Provision 2016/17	Revised Provision 2017/18	Revised provision 2018/19	Draft Budget Provision 2019/20	Draft Budget Provision 2020/21	Draft Budget Provision 2021/22	Draft Budget Provision 2022/23
Bulk Water	98.4	190.2	241.2	574.7	719.0	773.5	632.5	355.7	276.5	276.5
Reticulation	439.1	360.1	407.6	332.3	257.5	278.3	313.9	232.8	272.4	282.8
Waste water treatment Plant	188.1	205.3	316.6	212.2	292.0	336.0	297.6	338.4	536.1	325.8
WDM & Strategy	57.7	54.0	54.0	47.0	47.0	45.0	47.3	59.0	54.6	54.2
EAM	65.2	34.7	34.3	42.0	49.2	51.2	53.8	65.7	62.9	67.1
Other Branches	96.4	212.1	320.2	33.0	15.0	15.0	25.4	25.8	26.6	27.3
Total	944.9	1 056.3	1 373.9	1 341.2	1 379.8	1 499.0	1 380.5	1 077.3	1 229.0	1 033.7
New Infrastructure	483.0	555.7	670.8	990.4	1 093.7	1 132.7	950.8	706.3	818.7	607.3
Replacement Infrastructure	319.8	334.6	511.2	240.1	187.3	259.5	314.5	241.8	280.5	291.5
New Plant	40.1	33.8	30.7	39.6	44.6	54.6	58.9	61.4	66.0	71.0
Water Demand	57.6	54.0	54.0	47.0	47.0	45.0	47.2	58.9	54.5	54.2
Other	44.4	78.2	107.2	24.0	7.2	7.2	9.1	8.9	9.3	9.7
Total	944.9	1 056.3	1 373.9	1 341.2	1 379.8	1 499.0	1 380.5	1 077.3	1 229.0	1 033.7

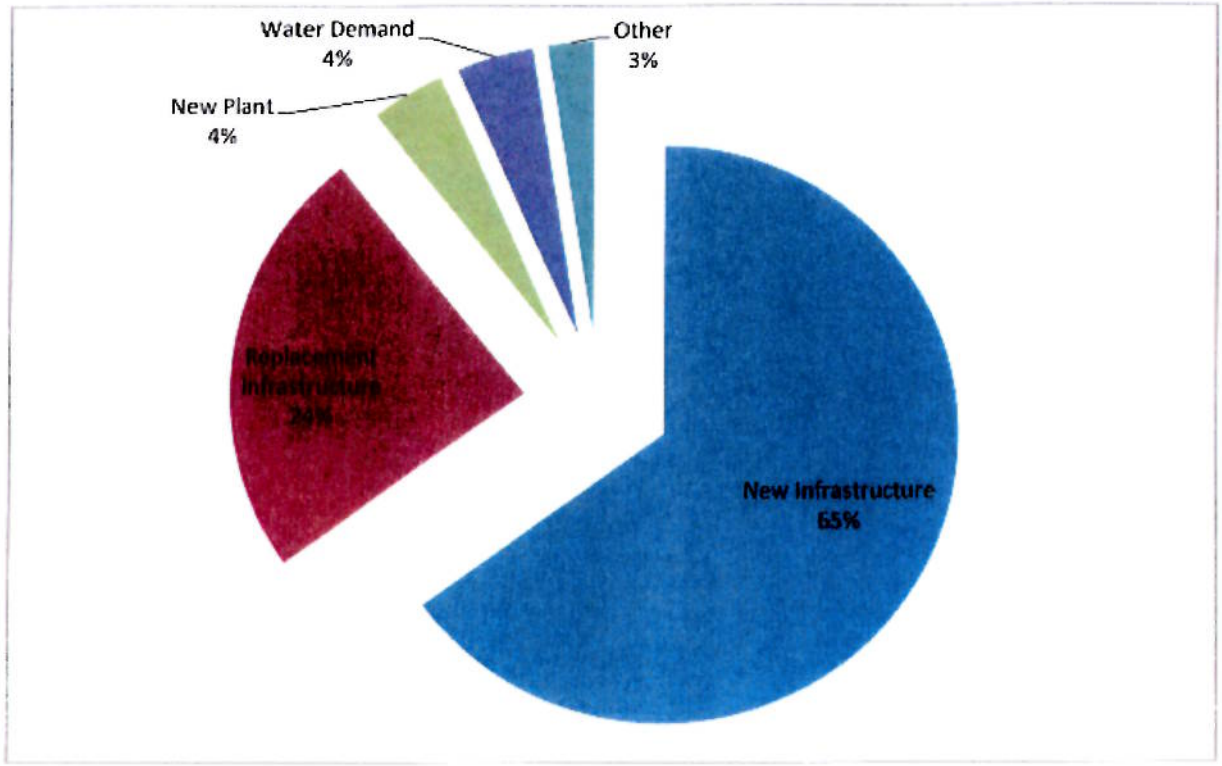


Figure 4: Long-term capital requirement by Investment Category

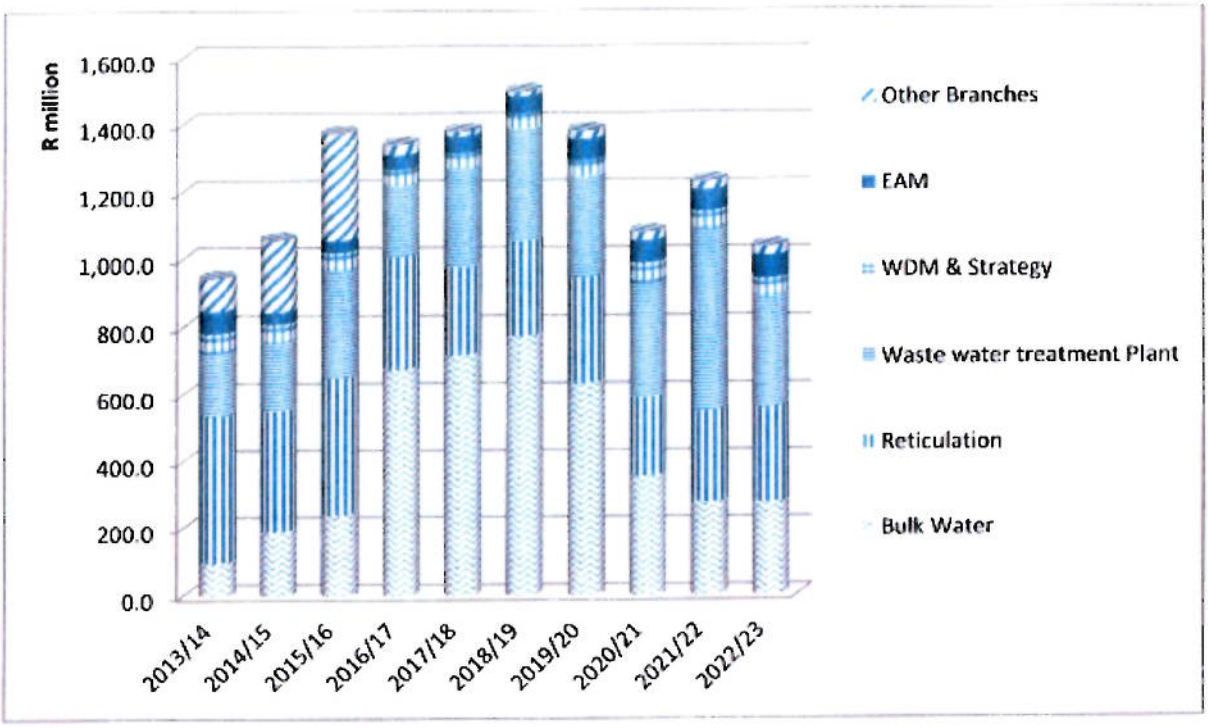


Figure 5: Long-term capital requirement by Branch

12.2.1. Strategic gaps

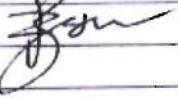
Capital budget: The high requirement for necessary infrastructure is driven largely by growth and economic development as well as the refurbishment of current infrastructure which places severe pressure on the City's Capital Budget.

Operating budget: It is difficult to reach optimum levels of staff, maintain acceptable levels of infrastructure maintenance and carry the impact of the capital programme within the financial constraints during difficult economic conditions.

12.2.2. Implementation strategies

To achieve the required Capital Budget, it is necessary to maximise the use of Grant funding and to make optimal use of the Capital Replacement Reserve (CRR) within the financial constraints.

The pressure on the operating budget needs to be addressed via above-inflation tariff increases

APPROVED BY:	MANAGER: WATER DEMAND MANAGEMENT & STRATEGY		
Name & Surname:	**Zolile Basholo**	Signature:	
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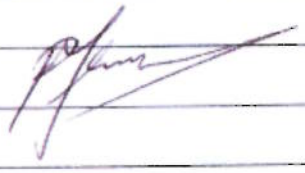
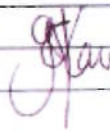
APPROVED BY:	DIRECTOR		
Name & Surname:	**Peter Flower**	Signature:	
Date:	2013-10-02	Comment:	
APPROVED BY:	EXECUTIVE DIRECTOR		
Name & Surname:	**Gisela Kaiser**	Signature:	
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