



# STELLENBOSCH MUNICIPALITY WATER SERVICES DEVELOPMENT PLAN FOR 2011/2012 EXECUTIVE SUMMARY



**DRAFT DOCUMENT  
30 JUNE 2011**

STELLENBOSCH MUNICIPALITY



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**STELLENBOSCH MUNICIPALITY**

**EXECUTIVE SUMMARY**

**WATER SERVICES DEVELOPMENT PLAN FOR**

**2011/2012**

<b>DESCRIPTION</b>	<b>PAGE</b>
Abbreviations and Definitions.....	ii
Key Terms .....	iv
Critical developments and associated factors that impacts our area for the immediate future .....	2
Administration .....	4
Demographics.....	6
Service Levels .....	9
Socio-Economic Background .....	11
Infrastructure .....	12
Operation and Maintenance.....	24
Associated Services.....	28
Conservation and Demand Management.....	30
Water Resources .....	35
Financial .....	40
Water Services Institutional Arrangements .....	43
Social and Customer Service Requirements.....	44
Needs Development Plan .....	45



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## ABBREVIATIONS AND DEFINITIONS

BDS	Blue Drop System
BSP	Buk Sewer Pipeline
BWP	Bulk Water Pipeline
CAFES	Conserving, Adequate, Fair, Enforceable and Simple
CoCT	City of Cape Town
COD	Chemical Oxygen Demand
CPP	CAFES cost and pricing strategy
CRC	Current Replacement Cost
DBSA	Development Bank of South Africa
DRC	Depreciated Replacement Cost
du	Dwelling Unit
DWA	Department of Water Affairs
DWQ	Drinking Water Quality
EHP	Environmental Health Practitioners
EPWP	Expanded Public Works Programme
FDA	Future Development Area
GAMAP	General Accepted Municipal Accounting Practices
GDS	Green Drop System
IAMP	Infrastructure Asset Maintenance Plan
IDP	Integrated Development Plan
ILI	Infrastructure Leakage Index
Kl/a	Kilolitre per year
KPA	Key Performance Area
KPI	Key Performance Indicator
l/s	Litres per second
LED	Local Economic Development
LFPR	Labour Force Participation Rate
LMP	Leakage Management Programme
MI	Mega litre
MI/a	Mega litre per year
MI/d	Mega litre per day
MNF	Minimum night flow
MOA	Memorandum of Agreement
NGO	Non Governmental Organisation
O&M	Operation and Maintenance
P&G	Preliminary and General
PAC	Powder Activated Carbon
PDD	Peak Daily Demand
PRV	Pressure Reducing Valve
PST	Pump Station
RDP	Reconstruction and Development Programme
RES	Reservoir
RM	Rand Million
RRAP	Risk Reduction Action Plan

<b>ABBREVIATIONS AND DEFINITIONS</b>
--------------------------------------

RUL	Remaining Useful Life
RWW	Reuse of Waste Water
SANS	South African National Standards
SCC	Sewer Consumer Connection
SDBIP	Service Delivery Budget Implementation Plan
SDF	Spatial Development Framework
SM	Stellenbosch Municipality
SPP	Socio-Political Programme
SPS	Sanitation Pump Station
SRP	Sewer Reticulation Pipeline
STW	Sanitation Treatment Works
TB	Tuberculosis
TMG	Table Mountain Group
TWL	Top Water Level
UARL	Unavoidable Annual Real Losses
VIP	Ventilated Improved Pit
WCC	Water Consumer Connection
WC/WDM	Water Conservation / Water Demand Management
WCP	Water Conservation Products
WCWSS	Western Cape Water Supply System
WDM	Water Demand Management
WRP	Water Reticulation Pipeline
WSA	Water Services Authority
WSDP	Water Services Development Plan
WTP	Water Treatment Plant
WTW	Water Treatment Works
WWQ	Waste Water Quality
WWTW	Waste Water Treatment Works

**KEY TERMS**

<b>TERM</b>	<b>INTERPRETATION</b>
Basic Water Supply Facility	The infrastructure necessary to supply 25 litres of potable water per person per day supplied within 200 metres of a household and with a minimum flow of 10 litres per minute (in the case of communal water points) or 6 000 litres of potable water supplied per formal connection per month (in the case of yard or house connections).
Basic Water Supply Service	The provision of a basic water supply facility, the sustainable operation of the facility (available for at least 350 days per year and not interrupted for more than 48 consecutive hours per incident) and the communication of good water-use, hygiene and related practices.
Basic Sanitation Facility	The infrastructure necessary to provide a sanitation facility which is safe, reliable, private, protected from the weather and ventilated, keeps smells to the minimum, is easy to keep clean, minimises the risk of the spread of sanitation-related diseases by facilitating the appropriate control of disease carrying flies and pests, and enables safe and appropriate treatment and/or removal of human waste and wastewater in an environmentally sound manner.
Basic Sanitation Service	The provision of a basic sanitation facility which is easily accessible to a household, the sustainable operation of the facility, including the safe removal of human waste and wastewater from the premises where this is appropriate and necessary, and the communication of good sanitation, hygiene and related practices.
CRC	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset. GAMAP defines CRC as the cost the entity would incur to acquire the asset on the reporting date.
DRC	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
IDP	A municipal plan as defined in the Municipal Systems Act.
MIG	A conditional grant from national government to support investment in basic municipal infrastructure.
RUL	The time remaining over which an asset is expected to be used.
Strategic Framework for Water Services	The Strategic Framework provides a comprehensive summary of policy with respect to the water services sector in South Africa and sets out a strategic framework for its implementation over the next ten years.
WSA	A WSA is any municipality that has the executive authority to provide water services within its area of jurisdiction in terms of the Municipal Structures Act 118 of 1998 or the ministerial authorisations made in terms of this Act. There can only be one water services authority in any specific area. Water services authority area boundaries cannot overlap. Water services authorities are metropolitan municipalities, district municipalities and authorised local municipalities.
WSDP	A plan for water and sanitation services in terms of the Water Services Act.

**KEY TERMS**

<b>TERM</b>	<b>INTERPRETATION</b>
WSP	<p>A Water services provider is</p> <ul style="list-style-type: none"><li>• Any person who has a contract with a water services authority or another water services provider to sell water to, and/or accept wastewater for the purpose of treatment from, that authority or provider (bulk water services provider); and / or</li><li>• Any person who has a contract with a water services authority to assume operational responsibility for providing water services to one or more consumers (end users) within a specific geographic area (retail water services provider); or</li><li>• A water services authority which provides either or both of the above services itself</li></ul>
WC	The minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water.
WDM	The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water in order to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.

## EXECUTIVE SUMMARY

Every WSA has a duty to all customers or potential customers in its area of jurisdiction to progressively ensure efficient, affordable, economical and sustainable access to water services that promote sustainable livelihoods and economic development.

Sections 12 and 13 of the Water Services Act (Act No 108 of 1997) place a duty on WSAs to prepare and maintain a WSDP. The DWA has developed a new set of WSDP guidelines (October 2010) to assist WSAs with the WSDP process and to provide a framework for the capturing of the data. The business elements included in the guidelines and addressed in detail in the three Modules of BWM's WSDP are as follows:

- Administration
- Demographics Profile
- Service Levels Profile
- Socio Economic Background Profile
- Water Services Infrastructure Profile
- Operation and Maintenance Profile
- Associated Services Profile
- Water Resources Profile
- Conservation and Demand Management Profile
- Financial Profile
- Institutional Arrangements Profile
- Social and Customer Service Requirements Profile
- Needs Development Plan

The 2011/2012 WSDP of SM consists of the following documents.

- Executive Summary document (For Council approval and Public Participation Process)
- Module1: Overview and assessment of the status of information and strategies on a WSA level.
- Module 2: Detailed information: Enabling factors compliancy supportive information.
- Module 3: Future plans and strategic supportive information.

The primary instrument of planning in the water services sector is the WSDP. The following principles apply to the WSDP:

- All WSAs must develop a WSDP.
- A new plan must be developed every five years and the plan should be updated as necessary and appropriate in the interim years.
- The WSDP must be integrated with the IDP of the municipality, as required in terms of the Municipal Systems Act.
- The WSDP must integrate water supply planning with sanitation planning.
- The WSDP must integrate technical planning with social, institutional, financial and environmental planning. The planning of capital expenditures must also be integrated with the associated operation and maintenance requirements and expenditures.



- The WSDP must be informed by the business plans developed by water services providers and with the plans of any regional water services providers, as relevant.
- The plan must take into account the impact of HIV/Aids on future water demand.
- The WSDP must integrate with the catchment management strategy.
- The planning process must take into account the views of all important stakeholders, including communities, through a consultative and participatory process. Every effort must be made to ensure the adequate and meaningful participation of women in consultation forums.
- The draft plan must be made available for public and stakeholder comment and all comments made must be considered when preparing the final plan.
- The contents of the WSDP must be communicated to all important stakeholders, including DWA.
- A WSA must report annually and in a public way on progress in implementing the plan.

This WSDP is for the 2011/2012 financial year and is an update of Stellenbosch Municipality's 2007 WSDP. The WSDP is aligned and integrated with the 2011/2012 IDP of Stellenbosch Municipality and needs to form an integrated part of the IDP public participation and consultation process. The IDP is predominantly strategic as opposed to the WSDP that are more operationally orientated.

Part of the WSDP is to identify strategies (Module 3) that need to be developed to address the information shortfalls and other constraints, which impact on service delivery. The implementation strategies should not constitute a wish-list, but must be reasonable and achievable within the capital and operational budget and staff constraints of Stellenbosch Municipality. The WSDP should be revised regularly, reporting the information for the previous five years and the projected future requirements. It is not a stagnant document, but rather a living process reliant on improvement and enhancement through the input provided by councillors, officials and technical assistants.

## CRITICAL DEVELOPMENTS AND ASSOCIATED FACTORS THAT IMPACTS OUR AREA FOR THE IMMEDIATE FUTURE

### Urban versus Rural Backlogs:

There is no basic water and sanitation services backlog in the urban areas of SM's Management Area. A small number of the households on the farms in the rural areas are still without basic water and sanitation services, as identified through the detail rural survey study of the existing service levels on the farms that was done during 2007/2008 by the Cape Winelands District Municipality ("Ensuring provision of water services to residents living on privately owned land").

The Municipality's biggest challenge is to address the housing backlog in the urban areas and to ensure that the necessary bulk infrastructure is in place in order to meet the future demands. The housing need for SM is 20 852 units (May 2011). The existing infrastructure is in a relative good state and therefore it is important for the Municipality to maintain the existing public investment. Adequate budget needs to be allocated to essential rehabilitation and maintenance of the existing infrastructure. Due to the lack of adequate funds, such maintenance is however in competition with the need to extend services to the poor communities.

### Reliance on Water Resources Available and Bulk Infrastructure

SM is currently busy with the updating of the Service Delivery Agreements with the CoCT for the provision of potable bulk water to some of the towns in SM's Management Area. SM is also currently busy with the investigation of various augmentation options for the towns in SM's Management Area, in order to meet the projected future water demands.

The upgrading of the Paradyskloof WTWs and the Stellenbosch WWTWs are currently taking place. The other WWTWs are also being refurbished, with a Risk Reduction Action Plan that is being implemented, in order to improve the performance of the existing WWTWs and to ensure that the treated effluent discharged from the WWTWs complies with the legal requirements. All future infrastructure planning is guided by the Water and Sewer Master Plans that were developed during February 2008 and which is currently being updated.

#### Links between Water Supply and Sanitation

The Water and Sewer Master Plans are linked to SM's SDF. The future development areas were identified as part of the SDF. Water supply and water and sanitation services are balanced with land usage and development planning. All service delivery is done in accordance with the availability of water and the capacities of the WTWs and WWTWs that are in place or that will be implemented.

#### Limited Implementation and Operating Capacity in Some Municipalities

At a technical, operations and management level, municipal staff is continuously exposed to training opportunities, skills development and capacity building in an effort to create a more efficient overall service to the users.

SM will also continue with their mentoring role for operators ensuring and adequately trained and classified workforce with dedicated training programmes for supervisors and operators. Budgets need to be established to address the shortfall of skilled staff, rethink methods to retain qualified personnel and plan for succession and clear career paths for experienced staff. With such a program a source of specific resources of skilled operators, technicians and managers will be established.

#### Available funding

The Capital Budget for Water and Sanitation Services are R70.907M for 2011/2012, R96.73M for 2012/2013 and R51.926M for 2013/2014. SM needs to identify all possible sources of funding for capital projects. An Asset Management Plan needs to be developed from the Asset Register, which will indicate the real replacement values and service lives of the assets and the funds required to provide for adequate asset replacement.

#### Affordability of Service Levels (Operation and Maintenance Costs)

Both Water and Sanitation Services are currently managed by SM in a financial sustainable manner. The Municipality implements a step water tariff system.

#### Growing Backlog in Refurbishment of Existing Infrastructure

SM has been one of the more proactive municipalities in the Western Cape Province in responding to the call from many quarters to improve the management of municipal infrastructure assets. An Infrastructure Asset Register is in place for all water and sanitation infrastructure. The depreciated replacement costs were calculated for all the infrastructure, which indicated that 52.3% of the value of the water infrastructure has been consumed and 54.5% of the value of the sewage supply network has been consumed.

It is essential for SM to protect their assets by ensuring that an Infrastructure Asset Management Plan is developed and implemented. This plan is based on the principle of preventative maintenance in order to ensure that, as far as this is practical, damage to assets is prevented before it occurs. Assets must be rehabilitated and / or replaced before the end of their economic life and the necessary capital funds must be allocated for this purpose.

Maintenance activities have been increasingly focused on reactive maintenance as a result of the progressive deterioration and failure of old infrastructure. Consequently, there has been dilution of preventative maintenance of other infrastructure. A regime of planned preventative maintenance should be established for all infrastructure assets classified as critical and important in the Asset Register. Consideration should be given to the establishment of a maintenance management system to enable SM to better manage its risks, and more effectively plan and prioritise the wave of renewals that are going to be required over the next 20 years.

### Major Economic Development

Investing in infrastructure creates an enabling environment for economic growth and is an important precondition for sustainable growth. Although SM has a potential for growth at much higher rates, failure to ensure adequate rehabilitation and maintenance of the existing infrastructure poses a serious threat to the local economy. The deterioration of water and sewer networks and rapid development, which is not always matched by growing capital expenditure, can further exacerbate the situation. SM therefore needs to continue with the rehabilitation and maintenance of their existing infrastructure in order to ensure the medium to long term sustainability of the existing infrastructure.

### Associated Population Growth and Water Demand

Detail water balance and future water demand projection models were developed as part of the WSDP process, in order to adequately plan for the augmentation of the existing water sources. The Municipality also needs to actively implement the new WDM Strategy, which is being developed with funding support from the DWA, in order to reduce their current percentage of non-revenue water as far as possible and to keep the future water demand as low as possible. SM will start with the implementation of various augmentation options, once the detail bulk water study is completed, in order to meet the future demands of the various towns.

## ADMINISTRATION

Section 14 of the Water Services Act requires that the WSA must take reasonable steps to bring its draft WSDP to the notice of a number of different stakeholders so that they have the opportunity to comment on it.

The 2011/2012 WSDP will be distributed to the public as part of the IDP public participation process. The draft WSDP will also be distributed to all the neighbouring WSAs for their comments. All relevant comments received on the draft WSDP will be included in the final WSDP.

**Community Participation:** SM realizes that the community plays a crucial role when it comes to identifying and reaching their strategic objectives. The Municipality still aims at a bottom-up approach by involving the ward committees in a more structured way through a ward-based planning approach and by getting them to become custodians of the IDP process.

The municipality utilized the following structures to ensure that it reached out to all the members of the community.

- Mayor's open door policy
- Review of the needs of the communities and their broader stakeholder network
- Ward Committee meetings
- Key stakeholder Engagements.

The Vision and Mission statements of SM, as included in their 2011/2012 IDP, are as follows:

### VISION STATEMENT

A dynamic, efficient, accountable and caring frontline organisation dedicated to professionalism, excellence, good governance and the pursuit of sustainability in delivering on our Constitutional mandate by fostering social and economic development in viable local economies and creating opportunities for all in Greater Stellenbosch to improve their quality of life in safe, sustainable human settlements.

### MISSION STATEMENT

To serve the Greater Stellenbosch community with integrity and efficiency through

- the delivery of municipal services,
- the promotion of managed local economic and social development and the creation of local jobs,
- the maintenance of a safe, healthy, sustainable and unique living environment and
- the active engagement of civil society in the business of the Municipality.

SM has identified the following **strategic challenges**:

- the provision of basic and affordable services in a financially sustainable manner;
- the redistribution of resources within and between communities, in order to achieve social justice and equality;
- to provide access to employment and educational and commercial opportunities for a large section of the population;
- to remain a viable destination for investors; and
- to manage our natural and historical resources for the benefit of this and future generations.

To address these challenges SM has defined **eight corporate Key Performance Areas (KPA)** that constitute the focus of the organization over the next five years:

- Basic service delivery and infrastructure development
- Local economic development
- Social development
- Community safety
- Planning, heritage and environment
- Municipal transformation and institutional development
- Municipal financial viability
- Good governance and community participation

**SM has, in addition, set the following priorities:**

- The eradication of poverty.
- Sustainable economic development and the creation of employment opportunities in the commercial, industrial and agricultural sectors (with special reference to land reform as a vehicle to assist in employment generation).
- Building civic pride, dignity and a united town and region.
- Regional, spatial and transportation planning that ensures sustainable practices.
- The development of integrated human settlements, and finding solutions for homelessness and overcrowding.
- Sustainable resource use, including energy efficiency and the promotion of renewable energy, zero waste, secure water supplies and biodiversity conservation.
- Access to social security programmes
- Crime prevention and victim support.

- Health care provision, including the promotion of healthy living practices
- Addressing youth and gender issues.

## DEMOGRAPHICS

### Status Quo:

SM falls within the Berg Management Area and covers areas such as Stellenbosch, Franschhoek, Klipmuts, Lanquedoc, Johannesdal, Kylemore, Pniel, Great Drakenstein, Wemmershoek, La Motte, De Novo, Muldersvlei, Elsenburg, Koelenhof, Vlottenburg, Lynedoch, Raithby and Jamestown. SM, like all other WSAs countrywide, faces a series of challenges namely:

- Provision of basic services on a sustainable basis.
- Stimulating local economic development.
- Sound management of its financial affairs.
- Strengthening continued community participation in the affairs of Local Government.
- Provision of subsidised / low cost housing.
- Development of a social strategy.
- Growing population, unemployment and poverty.
- Continued reformation in local government.
- Backlog in infrastructure.

The **Top ten (10) Ward Priorities**, as identified in the IDP, were as follows:

- Housing and land for housing
- Public Safety / Law Enforcement
- Unemployment / Job Creation / Poverty Alleviation
- Traffic flow (Traffic calming) and parking problems
- Skills Development and Training
- Sports facilities and land for sport facilities
- Littering / Cleanliness of areas and streets
- Youth / Women development / empowerment programs
- Proper participatory and sensitive planning (respect character of the area)
- Conservation (Urban areas)

From a Water Services perspective, the most significant challenges are the augmentation of the existing water sources, the replacement and upgrading of old infrastructure to accommodate development, the provision of sustainable basic services to informal settlements, and to ensure the provision of basic services to rural communities located on private farms. Strategies and action plans will need to be developed and implemented, in collaboration with farm owners, in order for the Municipality to fulfil its legal obligations and responsibilities as WSA.

**Climate Change:** In terms of adapting for climate change, water systems will need to be more robust and new / alternative sources of supply may need to be found. Increased skills will be required from water managers and long-term water projections are required.

Although an overall decrease in rainfall is generally not forecasted, increased variability in the climate and frequency of extreme events, as well as increased temperature and wind could have an impact on water sources, particularly surface waters.

It is therefore advisable for SM that a conservative approach be followed regarding the management of water sources. It is proposed that the following approach be adopted to mitigate and adapt to the impacts of climate change:

- establish assurance of supply levels of all water sources;
- increase assurance of supply of the water resources by ensuring that there is at least 10% additional capacity (headroom), when considering the maximum 24 hour demand on the peak month of the year;
- do not undertake new developments unless a proper investigation of the implication on water sources and sustainability in the long term has been undertaken;
- vigorously implement WDM measures, especially in terms of the following:
  - increased water efficiency
  - frequent monitoring of the water supply system, from the sources to the consumers; and
  - regular and adequate system maintenance and repairs.

**Floods:** One of the climate change threats in some parts of the Western Cape is the likelihood of floods with greater intensity and longer term impacts. There is likely to be increases in the severity and unpredictability of weather patterns. Flooding and storms are predicted which could have devastating effects on agricultural production.

#### **Demographic Perspective:**

**Economics:** The local economy is broad-based, with (higher) education, agriculture, agri-processing, financial and business services, tourism as well as retirement settlements as significant growth sectors and with most of the other sectors also showing local momentum. The most important challenges currently facing economic development in SM's Management Area are as follows:

- Sector growth has to be continuously supported and encouraged (even with the more dynamic sectors and niches of the local economy, like tourism and agriculture).
- New investment opportunities have to be promoted, focussing on foreign, up-country and potential local investors.
- Given ever-tougher competition between towns and regions, Stellenbosch has to be marketed in an effective way.
- Infrastructure facilities have to be expanded to meet longer-run growth and simultaneously create better services in poor and isolated communities.
- Small, medium, micro- and informal enterprises in the municipal area need better access to well co-ordinated support services.
- Human skills development needs to be expanded, with particular emphasis on special needs of poor and inadequately educated people in the area.
- Land reform has to be accelerated with due attention to complementary needs to make such reforms a success.
- Local Empowerment efforts have to be broadly supported and better communicated to accelerate the pace and spread of the process.
- Efforts to meet housing shortages and upgrading housing stock need to be intensified.

- Income generating activities need to be expanded or supported near settlements accommodating predominantly poor people.
- Steps need to be considered and formalised to safeguard the longer-run water supply demand balance in the municipal area.
- The use of alternative energy has to be encouraged and facilitated.
- Applied research into LED issues and strategies should be strengthened in co-operation with the University.
- LED focused discussions and planning need to be broadened in order to incorporate all relevant segments of local communities.
- The management capacity of leading LED stakeholders and programme planners has to be strengthened.

**Social:** The key human development issues facing the Municipality include poverty and inequality and unemployment and food security. The twofold challenges are therefore as follows:

- Find skills to supply these sectors. Requires high quality environments in which to live and relatively affordable middle and social housing – if going to avoid commuting.
- Ensure demand for low skilled labour that will otherwise feed unemployment – i.e. agriculture and tourism.

The spatial proposals included in SM's SDF, with regard to human development indicators, are as follows:

- Promote intensification of agriculture, bio-diversity conservation and agri-tourism in farming areas outside of urban settlements including encouraging (incentives) use of current fallow land so as to increase agricultural, tourism and service employment potential. This could include municipality using its land as surety for Land Bank / DBSA / IDC loans and promoting partnership land reform projects on private and municipal land.
- Ensure balanced supply of middle and upmarket housing located in existing and proposed settlements so as to minimise need to travel around and outside of the Municipality.

#### Gaps and Strategies:

The spatial proposals included in SM's SDF, with regard to settlements, are as follows:

- Develop the municipal as a system of interconnected, nodal, tightly constrained settlements that have only minimal outward expansion, relatively dense internal plans and which are linked with other settlements by high speed voice and data communications and road and rail public transport services.
- Prioritise the development of settlement locations, first, on the rail routes and secondly on the road routes.
- Acquisition, or not, of land for development should be informed by this priority.
- Internal average gross densities should vary between 15du/ha for small settlements and 25du/ha for large ones, particularly where public transport has become necessary. Probably only in Stellenbosch town at this point.
- Urban design frameworks are required for each settlement to ensure satisfactory performance levels.
- The principles of walking distance, functional integration, socio-economic integration, appropriate densification and the urban edge should inform settlement design.

SM's SDF propose the following with regard to a Vision Statement (March 2010):

Vision Statement	Background	Implications
Global warming and climate change	General worldwide consensus that current consumption and production patterns in most capitalist societies, especially SA with its reliance on coal fired energy, are precipitating a tipping point that will lead to cataclysmic climate change in the next 30 – 40 years. SM is no exception to this worrying trend.	The decade 2010 – 2020 provides an important opportunity to restructure consumption and production patterns so as to considerably reduce demand on eco-system services.
Social justice and human development	Increasing numbers of unemployed or underemployed people moving to the towns and villages from nearby farms or remote rural areas. SM should maximize opportunities for low skilled job seekers found mainly in the agricultural, tourism, service and domestic work sectors and these sectors' interests and growth potential should be carefully nurtured.	The use of privately and publicly owned land should promote these sectors' interests. Therefore, large scale, high income housing projects whose land take and development do not directly contribute to these sectors' interests should only be considered to the extent that they are necessary to address the demand of local residents working in the local economy, i.e. they should not cater for commuters to the City of Cape Town and other surrounding settlements.
Economic productivity	The Municipality has vibrant agricultural and tourism as well as significant but declining manufacturing and growing financial services sectors. These are both directly and indirectly rooted in the agricultural and scenic landscape of the Municipality.	The continued success of these economic sectors is dependent on maintaining the Mun's agricultural base and scenic quality. Present and future housing need is situated in the social, GAP and lower middle income sectors. These sectors are where public and private sector housing should be focused and delivered in the next decade.

## SERVICE LEVELS

### Status Quo:

The current residential water and sanitation service levels in SM's Management Area are as follows (Consumer Units):

Area	Stellenbosch	Stellenbosch Farms	Franschoek	Franschoek Farms	Wemmershoek	Klapmuts	Dwarsrivier	Raithby	Other Farms	Total
<b>WATER SERVICES LEVELS</b>										
Basic Need (RDP)	0	0	0	0	0	0	0	0	125	125
Housing Need (No Services)	201	0	0	0	0	16	10	0	0	227
Housing Need (Communal Services)	8 260	0	1 635	0	0	240	0	0	0	10 135
Adequate	11 894	298	1 935	132	183	1 269	1 898	107	3 940	21 656
<b>Total</b>	<b>20 355</b>	<b>298</b>	<b>3 570</b>	<b>132</b>	<b>183</b>	<b>1 525</b>	<b>1908</b>	<b>107</b>	<b>4 065</b>	<b>32 143</b>
<b>SANITATION SERVICE LEVELS</b>										
Basic Need (RDP)	0	0	0	0	0	0	0	0	260	260
Housing Need (No Services)	29	0	0	0	0	36	10	0	0	75
Housing Need (Communal Services)	8 432	0	1 635	0	0	220	0	0	0	10 287
Adequate	11 894	298	1 935	132	183	1 269	1 898	107	3 805	21 521
<b>Total</b>	<b>20 355</b>	<b>298</b>	<b>3 570</b>	<b>132</b>	<b>183</b>	<b>1 525</b>	<b>1908</b>	<b>107</b>	<b>4 065</b>	<b>32 143</b>

Note: Basic Need (RDP) – Formal erven without basic services

Housing Need – Households in informal areas (Exclude backyard dwellers on formal erven)



### Gaps and Strategies:

As a priority it is the responsibility of SM to make sure that adequate and appropriate investments are made to ensure the progressive realisation of the right of all people in its area of jurisdiction to receive at least a basic level of water and sanitation services. Whilst the provision of basic water services is the most important and immediate priority, WSAs are expected to provide intermediate and higher levels of services (for example, water on-site) wherever it is practical and provided it is financially viable and sustainable to do so.

All water services provided by SM to consumers within their Municipal Management Area are linked to the Municipality's Tariff Policy and Tariff Bylaws and poor households are incorporated through SM's Indigent Policy.

The large number of residents in the lowest income groups (living in informal areas) places a major challenge on SM to provide suitable housing. SM works towards providing all households in the towns with a water connection inside the house and connecting all households to a waterborne sanitation system.

All the formal households in the urban areas of SM's Management Area are provided with water connections and waterborne sanitation facilities inside the houses (Higher level of service). Communal standpipes and ablution facilities are provided in the informal areas as a temporary emergency service. SM takes note of the fact that communal standpipes represent probably the weakest part of a network's water supply services. Standpipes are often constructed in ways that cannot withstand excessive use (and abuse) and are often neglected in terms of operation and maintenance, adversely affecting the health of its already vulnerable and poor users. Communal standpipes are also used by poor households who normally don't pay for water.

A sustainable type of water and sanitation facility needs to be provided to the households on the farms, with current services below RDP standard. SM is committed to support the private landowners as far as possible with regard to addressing the current services backlog on the farms in the rural areas, as identified through the Cape Winelands Rural Survey of Service Levels.

SM is however faced with various challenges with regard to the provision of services on private owned land in a financial sustainable manner (enabling the ongoing operation of services and adequate maintenance and rehabilitation of the assets), which include the following:

#### Free basic water policy:

- The provision of the infrastructure (facilities) necessary to provide access to water to all households in a sustainable and economically viable manner.
- The development of subsidy mechanisms which benefit those who most need it.

#### Free basic sanitation policy:

- Provision of the correct sanitation facility to the poor household.
- Health and hygiene promotion must be provided in a co-ordinated manner and must be properly managed and adequately funded if free basic sanitation is to become a reality. This requires close collaboration between the EHPs of the Cape Winelands District Municipality responsible for environmental health and SM.
- Subsidising the operating and maintenance costs. If the basic service is to be provided free to the poor then SM must ensure that the costs of providing the service are covered by the local government equitable share and / or through cross-subsidies within SM's Management Area.

The ownership of water services assets may be in the hands of the person owning the land where an “on-site” water or sanitation facility is provided to a household. There is no legal impediment to the use of government grants to fund infrastructure for a poor household on private land not owned by that household, provided that the intermediary (the private land owner) makes a financial contribution (This is because the intermediary becomes the owner of the infrastructure once it is installed). Government is looking at specific policies with regard to the appropriate level of contribution.

The clinics and hospitals in SM’s Management Area have adequate and safe water supply and sanitation services. All the schools in SM’s Management Area also have adequate and safe water supply and sanitation services. It is important for the schools in SM’s Management Area to focus on Water Demand Management activities and for SM to support the schools with a WDM programme.

**SOCIO ECONOMIC BACKGROUND**

Status Quo:

The population of SM is currently estimated at approximately 222 575 persons for 2010, according to the 2011/2012 IDP. The projected present population and population growth rates are summarised in the table below:

Distribution System	Census 2001			2001 - 2010	Projections for 2010	
	Population	Number of Households	Persons / Household	Growth %/a	Population	Number of Households
Stellenbosch	85 892	28 263	3.04	7.3%	162 344	53 421
Franschhoek	20 341	4 674	4.35	7.3%	38 447	8 835
Klapmuts	3 946	927	4.26	7.3%	7 458	1 752
Dwarsrivier	7 579	1 594	4.75	7.3%	14 325	3 013
<b>TOTALS</b>	<b>117 758</b>	<b>35 458</b>	<b>3.38</b>	<b>7.3%</b>	<b>222 574</b>	<b>67 021</b>

The potentially economically active population in SM’s Management Area increased from 82 090 people in 2001 to 141 179 people in 2007, which means that the potentially economically active population increased with 59 089 new entrants over the six-year period. The labour force grew at an annual average rate of 9.5% over the period 2001 to 2007, with the labour force participation rate (LFPR) increasing marginally from 63.9% in 2001 to 64.1% in 2007.

Although employment grew by 9.5% during the period 2001 to 2007, the unemployment rate remained unchanged at 17.1% over the same period. Those employed increased from 43 516 people in 2001 to 75 021 people in 2007, meaning that 31 505 more people found employment in the region.

Over the 2001 to 2007 period, the not economically active population increased by 14 867 people from 30 458 to 45 415 people; which implies more people that could potentially work are not seeking employment.

In 2007, the biggest specified industry employment contributors were: manufacturing (20.2%), community; social and personal services (17.4%), wholesale and retail trade (16.3%) and agriculture, hunting, forestry and fishing (12.7%).

SM’s vision aims to foster social and economic development, establish a viable local economy and create opportunities in order to improve the quality of life of all its residents within safe and sustainable settlements. It should be recognised that the pursuit of the strategies to overcome the aforementioned developmental challenges requires a medium to long-term sustained commitment as there are no quick fixes. Ultimately success should be measured in terms of the extent to which local role players forge their resources in a collective and coordinated way to realise the strategic goals of local economic development.

Gaps and Strategies:

It is important for SM to focus on labour intensive construction methods (EPWP projects) when implementing new projects. This process involves attacking poverty through job creation in the delivery of sustainable services. The Guidelines for the Implementation of Labour Intensive Infrastructure Projects under the Expanded Public Works Programme is available to assist Municipalities.

The Municipality needs to collaborate with the private sector and local non-profit organizations to provide needed skills at all levels, commission a skills audit and gap assessment and a skills development exercise focusing on specific priorities. The projects should focus on socio-economic upliftment, as part of SM's strategy to bring about poverty alleviation through job creation whilst enhancing the prospects of reducing outstanding municipal consumer debt.

The main objectives of these projects should be as follows:

- Create employment
- Reduce poverty
- Reduce outstanding municipal debts
- Transfer / develop skills
- Create facilities, build infrastructure and improve service delivery
- Draw people into the economy (opening bank accounts)
- Build pride of ownership in the community
- Involve communities in developing their areas.

Job creation must remain a major priority for the SM, as it should be for all spheres of government, especially since the Municipality alone does not have the power or resources to fully address unemployment.

Investing in infrastructure creates an enabling environment for economic growth and is an important precondition for sustainable growth. Although SM has a potential for growth at much higher rates, failure to improve the current state of infrastructure poses a serious threat to the local economy. The deterioration of networks and rapid development, which is not matched by growing capital expenditure, further exacerbates the situation. Adequate rehabilitation and maintenance of the existing infrastructure is critical in order to ensure the medium to long term sustainability of the existing infrastructure.

## INFRASTRUCTURE

Status Quo:

SM has been one of the more proactive municipalities in the Western Cape Province in responding to the call from many quarters to improve the management of municipal infrastructure assets. SM compiled a comprehensive Asset Register of their entire infrastructure.

**Water Infrastructure:** The current and depreciated replacement cost of the water infrastructure of SM is summarised in the table below:

Asset Type	GIS ID	CRC	DRC	% DRC/CRC
Bulk Water Pipelines	BWP	R99 352 866	R51 050 866	51.38%
Dams	DAM	R54 963 625	R26 389 276	48.01%
Water Pump Stations	PST	R45 956 442	R23 249 723	50.59%
Reservoirs	RES	R132 970 330	R66 924 861	50.33%
Water Consumer Connections	WCC	R139 755 000	R52 151 236	37.32%
Water Reticulation Pipelines	WRP	R312 084 416	R152 287 646	48.80%
Idas Valley	WTP1	R29 485 288	R17 620 798	59.76%
Paradyskloof	WTP2	R26 178 467	R11 147 691	42.58%
<b>Totals</b>		<b>R840 746 434</b>	<b>R400 822 097</b>	<b>47.67%</b>

The previous table means that 52.3% of the value of the water infrastructure has been consumed.

The following table gives an overview of the remaining useful life and the age distribution by facility type for the water infrastructure (CRC):

Asset Type	GIS ID	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
<b>RUL</b>						
Bulk Water Pipelines	BWP	R0	R0	R17 669 628	R25 174 177	R56 509 061
Dams	DAM	R0	R21 410 000	R0	R31 500	R33 522 125
Water Pump Stations	PST	R10 429 446	R24 283 049	R2 647 818	R3 695 380	R4 900 749
Reservoirs	RES	R620 562	R23 886 745	R586 360	R28 002 067	R79 874 596
Water Consumer Connections	WCC	R26 789 000	R11 998 000	R22 862 000	R15 253 000	R62 853 000
Water Reticulation Pipelines	WRP	R0	R13 608 418	R48 067 116	R62 271 436	R188 137 446
Idas Valley	WTP1	R2 488 305	R2 605 146	R1 281 400	R2 566 230	R20 544 207
Paradyskloof	WTP2	R7 590 093	R184 411	R439 745	R488 190	R17 476 028
<b>Totals</b>		<b>R47 917 406</b>	<b>R97 975 769</b>	<b>R93 554 067</b>	<b>R137 481 980</b>	<b>R463 817 212</b>

Asset Type	GIS ID	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
<b>Age distribution by Facility Type</b>						
Bulk Water Pipelines	BWP	R0	R5 993 543	R22 972 342	R16 616 290	R53 770 691
Dams	DAM	R0	R21 410 000	R0	R31 500	R33 522 125
Water Pump Stations	PST	R2 601 380	R33 623 207	R3 564 212	R1 350 468	R4 817 175
Reservoirs	RES	R19 590 911	R2 077 163	R1 702 328	R14 800 041	R94 799 887
Water Consumer Connections	WCC	R0	R8 526 000	R13 160 000	R5 789 000	R112 280 000
Water Reticulation Pipelines	WRP	R450 901	R43 650 983	R26 080 802	R27 052 751	R214 848 979
Idas Valley	WTP1	R2 332 944	R1 310 573	R4 743 116	R16 748 608	R4 350 047
Paradyskloof	WTP2	R2 435 527	R184 411	R488 190	R2 349 911	R20 720 428
<b>Total</b>		<b>R27 411 663</b>	<b>R116 775 880</b>	<b>R72 710 990</b>	<b>R84 738 569</b>	<b>R539 109 332</b>

The condition grading per water facility type is summarised in the table below:

Asset Type	GIS ID	Very Good	Good	Fair	Poor	Very Poor
Bulk Water Pipelines	BWP	R9 490 899	R36 091 276	R9 300 033	R26 801 030	R17 669 628
Dams	DAM	R0	R3 532 125	R51 400 000	R31 500	R0
Water Pump Stations	PST	R3 103 092	R8 881 885	R21 378 651	R10 831 814	R1 761 000
Reservoirs	RES	R19 590 911	R16 864 071	R46 782 401	R27 575 301	R22 157 646
Water Consumer Connections	WCC	R27 951 000	R27 951 000	R27 951 000	R27 951 000	R27 951 000
Water Reticulation Pipelines	WRP	R51 727 779	R65 371 075	R45 308 558	R88 001 469	R61 675 535
Idas Valley	WTP1	R1 002 000	R22 395 738	R1 359 560	R2 157 694	R2 570 296
Paradyskloof	WTP2	R2 380 527	R15 850 551	R302 296	R0	R7 645 093
<b>Total</b>		<b>R115 246 208</b>	<b>R196 937 721</b>	<b>R203 782 499</b>	<b>R183 349 808</b>	<b>R141 430 198</b>

Note: Condition grading for the Water Consumer Connections are not specified in the Asset Register and the total CRC were therefore distributed equally amongst the various categories.

About 38.6% of the water supply infrastructure is in a poor or very poor condition and the condition backlog is in the order of R324.8M. The bulk of the backlog is made up of the water reticulation pipeline assets.

**Sanitation Infrastructure:** The current and depreciated replacement cost of the sanitation infrastructure of SM is summarised in the table below:

Asset Type	GIS ID	CRC	DRC	% DRC/CRC
Bulk Sewer Pipeline	BSP	R47 116 191	R14 884 600	31.59%
Sewer Consumer Connection	SCC	R99 825 000	R37 250 883	37.32%
Sanitation Pump Station	SPS	R14 732 195	R8 840 038	60.00%
Sewer Reticulation Pipeline	SRP	R305 004 623	R138 839 848	45.52%
Stellenbosch WWTW	STW 1	R114 397 154	R52 690 080	46.06%
Klapmuts WWTW	STW 4	R9 273 580	R6 288 750	67.81%
Wemmershoek	STW 5	R5 772 339	R4 374 429	75.78%
La Motte	STW 6	R4 571 526	R2 759 152	60.36%
Franschhoek	STW 7	R12 719 670	R6 825 051	53.66%
Pniel	STW 8	R37 544 766	R22 976 150	61.20%
Raithby	STW 9	R1 990 934	R1 081 515	54.32%
<b>Totals</b>		<b>R652 947 978</b>	<b>R296 810 496</b>	<b>45.46%</b>

The above table means that 54.5% of the value of the sewage supply network has been consumed.

The following table gives an overview of the remaining useful life and the age distribution by facility type for the sanitation infrastructure (CRC):

Asset Type	GIS ID	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
<b>RUL</b>						
Bulk Sewer Pipeline	BSP	R23 792 283	R0	R0	R0	R23 323 908
Sewer Consumer Connection	SCC	R19 135 000	R8 570 000	R16 330 000	R10 895 000	R44 895 000
Sanitation Pump Station	SPS	R1 746 039	R7 284 557	R2 430 354	R528 850	R2 742 395
Sewer Reticulation Pipeline	SRP	R52 391 876	R11 559 801	R6 221 011	R55 303 402	R179 528 533
Stellenbosch WWTW	STW 1	R15 430 569	R42 011 577	R6 675 676	R6 314 372	R43 964 960
Klapmuts WWTW	STW 4	R459 165	R1 512 983	R610 182	R75 000	R6 616 250
Wemmershoek	STW 5	R114 500	R1 399 886	R250 000	R0	R4 007 953
La Motte	STW 6	R1 363	R1 680 448	R211 700	R55 000	R2 623 015
Franschhoek	STW 7	R503 397	R6 033 267	R55 000	R339 000	R5 789 006
Pniel	STW 8	R889 396	R4 999 949	R482 736	R379 000	R30 793 685
Raithby	STW 9	R700 000	R279 798	R67 798	R258 400	R684 938
<b>Totals</b>		<b>R115 163 588</b>	<b>R85 332 266</b>	<b>R33 334 457</b>	<b>R74 148 024</b>	<b>R344 969 643</b>

Asset Type	GIS ID	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
<b>Age distribution by Facility Type</b>						
Bulk Sewer Pipeline	BSP	R0	R0	R7 532 007	R6 300 067	R33 284 117
Sewer Consumer Connection	SCC	R0	R6 090 000	R9 400 000	R4 135 000	R80 200 000
Sanitation Pump Station	SPS	R3 059 206	R9 004 302	R595 894	R1 184 570	R888 223
Sewer Reticulation Pipeline	SRP	R1 289 357	R29 848 767	R53 472 773	R28 370 599	R192 023 127
Stellenbosch WWTW	STW 1	R1 744 076	R26 043 460	R6 365 858	R46 289 678	R33 954 082
Klapmuts WWTW	STW 4	R1 415 132	R1 972 148	R0	R5 886 300	R0
Wemmershoek	STW 5	R0	R5 772 339	R0	R0	R0
La Motte	STW 6	R154 305	R1 681 811	R55 000	R2 680 410	R0
Franschhoek	STW 7	R0	R4 744 689	R339 000	R3 329 685	R4 306 296
Pniel	STW 8	R0	R3 969 345	R427 736	R30 501 181	R2 646 504
Raithby	STW 9	R67 798	R979 798	R258 400	R609 560	R75 378
<b>Totals</b>		<b>R7 729 874</b>	<b>R90 106 659</b>	<b>R78 446 668</b>	<b>R129 287 050</b>	<b>R347 377 727</b>

The condition grading per sanitation facility type is summarised in the table below:

Asset Type	GIS ID	Very Good	Good	Fair	Poor	Very Poor
Bulk Sewer Pipeline	BSP	R0	R13 832 074	R3 659 093	R5 832 742	R23 792 282
Sewer Consumer Connection	SCC	R19 965 000	R19 965 000	R19 965 000	R19 965 000	R19 965 000
Sanitation Pump Station	SPS	R2 757 470	R4 141 134	R6 490 112	R1 132 585	R210 894
Sewer Reticulation Pipeline	SRP	R35 140 984	R89 760 217	R24 795 968	R89 067 667	R66 239 787
Stellenbosch WWTW	STW 1	R1 744 076	R49 797 676	R12 084 158	R17 870 943	R32 900 301
Klapmuts WWTW	STW 4	R1 415 132	R6 632 678	R860 405	R365 365	R0
Wemmershoek	STW 5	R3 694 553	R563 400	R1 399 886	R114 500	R0
La Motte	STW 6	R154 305	R2 928 429	R1 385 730	R103 062	R0
Franschhoek	STW 7	R0	R7 905 101	R2 519 197	R503 397	R1 791 975
Pniel	STW 8	R0	R31 777 726	R2 945 244	R901 796	R1 920 000
Raithby	STW 9	R67 798	R1 153 136	R70 000	R700 000	R0
<b>Totals</b>		<b>R64 939 318</b>	<b>R228 456 571</b>	<b>R76 174 793</b>	<b>R136 557 057</b>	<b>R146 820 239</b>

Note: Condition grading for the Sewer Consumer Connections are not specified in the Asset Register and the total CRC were therefore distributed equally amongst the various categories.

About 43.4% of the sanitation infrastructure is in a poor or very poor condition and the condition backlog is in the order of R283.4M. The bulk of the backlog is made up of the sewer reticulation assets and the Stellenbosch WWTW.

#### Gaps and Strategies:

### **BULK WATER INFRASTRUCTURE**

The Water Master Plan (February 2008) has indicated that based on the most likely land-use development scenario, it will be necessary to upgrade the following bulk water supply systems:

- **Stellenbosch:** The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A few distribution pipelines are required to reinforce water supply within the Stellenbosch distribution network. The most significant is the upgrading of the supply pipeline between Idas Valley reservoir and the Papegaaiberg reservoir through the Central zone network.
  - The rising main from the Kayamandi new pump station to the Kayamandi reservoir (This upgrade is possibly already installed).
  - Upgrading of the 225mm dia feeder main between Uniepark reservoirs and Cloeteville.
  - Upgrading of the feeder main to the Onder Papegaaiberg reservoir.
  - Upgrading of the rising main between the Papegaaiberg reservoir and the Kleinvallei reservoir (This upgrade is possibly already installed).
  - New rising main between Paradyskloof WTW and Brandwacht reservoir.
  - New feeder main to new Jamestown booster.
  - New rising main to the new Boschendal reservoir.
- **Franschhoek:** The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A few distribution pipelines are required to reinforce water supply within the Franschhoek distribution network as well as a cross-link between the Groendal zone and the Franschhoek Onder-dorp zone so that water can be transferred between these zones.
  - The feeder main between the Groendal reservoir and the Langrug reservoir should be upgraded.

- **Dwarsrivier:** The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A few distribution pipelines are required to reinforce water supply within the Dwarsrivier distribution network.
  - New 160mm dia rising main between new Boschendal pump station and Boschendal lower reservoir.
  - New 160mm dia rising main between Boschendal lower and upper reservoirs.
  - New feeder main to Boschendal upper booster pump station.
  - New feeder main between existing bulk pump 2 and the new Dwars River reservoir.
- **Klapmuts:** The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A number of distribution pipelines are required to reinforce water supply within the Klapmuts distribution network as well as new supply pipelines for the new future development areas.
  - New 355mm dia feeder main between Klapmuts 2 pump station (at Klapmuts Old reservoir) and the new Klapmuts lower reservoir.
  - Upgrade of the existing 200mm dia feeder main from the existing connection point on the CoCT's Wemmershoek pipe to the Klapmuts old reservoir.
  - New 400mm dia feeder main to Klapmuts pump station north of the N1.
- **Raithby:** The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A few distribution pipelines are required to reinforce water supply within the Raithby distribution network for the new future development areas as well as a new supply pipeline from the new proposed Raithby reservoir.
  - A new feeder main to the new Raithby reservoir is proposed.

Town	Description	Comments
Stellenbosch	3820m x 400mm parallel reinforcement of main pipe	Required urgently for Cloetesville water supply
	2395m x 355mm parallel reinforcement of main pipe	Required urgently for Cloetesville water supply
	975m x 355mm parallel reinforcement of Papegaaiberg rising main	Required soon for Kayamandi water supply
	740m x 250mm rising main to new Kayamandi reservoir	Required soon for Kayamandi water supply
	85m x 315mm parallel reinforcement of rising main	When item SSW.B10 is installed
	2080m x 160mm new rising main to Boschendal reservoir	When FDA AL3 develops
	695m x 200mm rising main to Brandwacht reservoir	When Welgelegen pump station reaches capacity
Franschhoek	520m x 160mm parallel reinforcement of bulk supply pipeline	When existing bulk supply nears capacity
Dwarsrivier	1535m x 315mm rising main to new Dwars River reservoir	Required when FDA's SD.B3 & SD.B7 develops
	50m x 250mm parallel reinforcement of main pipe	When item SDW.B2 is installed
	3660m x 160mm rising main to new Boschendal upper reservoir	When FDA SD.B1-2, 4-6 and 8-10 develops
	645m x 160mm rising main to new Boschendal upper reservoir	When FDA SD.B1 & 8 develops
Klapmuts	870m x 355mm bulk supply pipeline	When new Klapmuts 2 reservoir is built
	1385m x 355mm bulk supply pipe	When existing supply nears capacity
	3050m x 400mm bulk supply pipe	When new Klapmuts 3 reservoir is built
Raithby	215m x 160mm bulk supply pipeline	When new Raithby reservoir is built

## WATER TREATMENT WORKS INFRASTRUCTURE

The future upgrading options for the three WTWs managed by SM are summarised below:

**Idas Valley WTW:** Due to fairly competent day to day management ability available in the SM, only a number of items on the existing plant must be addressed in order for the plant to be optimally operated and comply with relevant safety and quality regulations. However, the facility should be run at a much more constant rate and it is recommended to utilise Paradyskloof WTW for peak supply and fluctuating demand as originally intended.

It was recommended that the WTW not be upgraded, but that operational measures and interventions be aimed at optimal use of available unit treatment processes and to address process risks identified in the Water Safety Plan. Three different alternatives were investigated for the future process alterations of the WTW and were comprehensively discussed in the "Idas Valley WTW: Upgrading Requirements – Technical Report". The three options were as follows:

### *Option 1:*

- Convert the facility to a more "conventional" process train by adding a flocculation / coagulation / clarification step between the aeration and filtration steps.
- Convert the Traditional Slow Sand Filters to Manz Slow Sand Filters, complete with backwash facilities.
- Allow facilities for pre-ozonation and PAC dosing.
- Retain chlorination and limestone contact tanks as is.

### *Option 2:*

- Provide conventional treatment pre-treatment by means of a combined flotation / filtration step following the existing aeration step.
- Allow for pre-flotation ozonation, as well as post filtration ozonation.
- Utilise the existing slow sand filters in the existing configuration to remove the bio degradable compounds.
- Retain chlorination and limestone contact tanks as is.

### *Option 3:*

- Retain the existing traditional slow sand filters as is and reinstate as per the original design intent.
- There is a lack of filter bed depth and the current operation practices cause the filter bed to foul deeper than the top 50mm. It is therefore proposed to limit the maximum flow rate per filter to ensure that individual filters are not overloaded.
- Given the effect of long term operational practices, it is recommended to resand the filters in line with the original design intent.
- It is further recommended to investigate the feasibility of pre-ozonation, bank filtration, PAC dosing facilities and post ozonation.



*Option 3 was identified as the most appropriate intervention for the following reasons:*

- The configuration makes optimal use of existing infrastructure and existing operational methodology.
- It provides for practical implementation as the system can be kept operational during construction and improvements can be undertaken in line with raw water quality deterioration.
- It retains the existing control philosophy.
- The existing system can be retrofitted with ozone pre- and post filtration treatment for Natural Organic Material and cyanobacterial toxin removal. Persistent organics can be adsorbed in a Granular Activated Carbon layer sandwiched in the sand filter between two layers of filter sand or dosing of PAC can be used as once-off emergency interventions.
- It has the lowest infrastructure requirement of the three options and therefore represents the cheapest option for both capital, as well as Operations and Management.

*Options 1 and 2 have the benefit that it is a multi-barrier system*

- Implementation is however relatively complex.
- Both processes are patented to some extent.
- Structure costs for both options are higher than that of Option 3.
- Much more complex and costly mechanical and electrical control systems are required.
- Energy cost will be similar for Options 1 and 2.
- Coagulant cost will be more for Options 1 and 2.

The Traditional Slow Sand Filter Process with pre-ozonation was identified as the most suitable option over the medium term. Both Natural and Organic Material and cyanobacterial toxin risk can be addressed by dosing of an oxidising agent and Powered Activated Carbon as risk mitigating measures. A further benefit of this approach is that it can be retained in the future as it forms part of the processes identified as feasible under Options 1 and 2.

The recommendation was therefore to retain and optimally manage the existing treatment system consisting of an aeration, slow sand filtration, stabilisation and disinfection.

**Paradyskloof WTW:** The alternative options for the upgrading of the Paradyskloof WTWs were discussed comprehensively in the "Paradyskloof Water Purification Plant: Upgrading Requirements – Technical Report". It was recommended that the WTW be upgraded to make optimum use of available unit treatment processes and to address risks identified in the Water Safety Plan. The design of the process alterations or interventions should commence as soon as possible. Due to the existing type of process employed, the following three different alternatives were investigated for the process alterations of the WTW:

- *Option 1:* Construct a duplicate works as per the original design intent.
- *Option 2:* Add a parallel ultrafiltration system with a capacity of 15 Ml/day.
- *Option 3:* Optimisation and retrofitting of the existing process train and additional rapid gravity filters.

*Option 3 was identified as the most appropriate intervention for the following reasons:*

- The configuration makes optimal use of build-in redundancy and existing operational methodology.
- It provides for practical implementation as the system can be kept operational during construction, except for modifications to the floc channel.
- It retains the existing control philosophy and requires no additional mechanical equipment for backwashing.
- The existing system can be retrofitted to Granular Activated Carbon filtration for Natural Organic Material and cyanobacterial toxin removal. However, Powdered Activated Carbon can immediately be introduced to deal with emergency situations pertaining to THM formation and cyanobacterial toxin adsorption.
- It has the lowest infrastructure requirement of the three options and therefore represents the cheapest option for both capital, as well as Operations and Management.

*Option 2 (Ultra filtration) has the benefit that it is a parallel system to the existing process train.*

- Implementation is relatively easy with most work being performed in a quality controlled factory environment.
- A filtration or suitable pre-treatment step may be required.
- Structure cost is lower than that of the conventional system (Option 1), but much more complex and costly mechanical and electrical control systems are required.
- A complex chemical backwashing regime is required.
- Energy cost will be much higher, while coagulant cost will be reduced.
- Membrane life and replacement cost.

The conventional process train was identified as the most suitable option. Both Natural and Organic Material and cyanobacterial toxin risk can be addressed by dosing of an oxidising agent and Powdered Activated Carbon as risk mitigating measures. A further benefit of the conventional approach is that it can be modified in the future to suit an upflow / downflow Granular Activated Carbon process step downstream of the rapid gravity filters as currently prescribed as best practice for DBP reduction by the American Environmental Protection Agency.

The recommendation was therefore to optimise and expand the existing conventional treatment system consisting of an aeration, flocculation, sedimentation, rapid gravity filtration, stabilisation and disinfection in a two phased approach.

**Franschhoek WTW:** The upgrading of the Franschhoek WTW will depend on the additional future water sources for the town. The future bulk water supply options for Franschhoek are currently being investigated by Worley Parsons.

## WATER PUMP STATIONS

The Water Master Plan (February 2008) has indicated that based on the most likely land-use development scenario, it will be necessary for the following water pump stations:

Town	Recommendations included in the Water Master Plan	Capacity (l/s)	Head (m)
Stellenbosch	Upgrading of the new Kayamandi pump station at the Kleinvallei reservoir (This upgrade is possibly already installed)	85	16
	Upgrading of Papegaaiberg pump station (This upgrade is possibly already installed)	140	90
	Upgrade Idas Valley pump station	185	55
	New Brandwacht pump station at Paradyskloof WTW	35	62
	New Boschendal pump station	12	122
Franschhoek	Upgrade the Langrug pump station	16	44
Dwarsrivier	Upgrade bulk pump station 2	90	110
	New booster pump station for the Dwars River reservoir booster zone		
	Upgrade Johannesburg pump station between the Johannesburg lower zone and the Johannesburg upper reservoir	23	70
	Upgrade Kylemore pump station at the Kylemore lower reservoir	14	62
	New pump station to supply water to the new Boschendal lower reservoir	15	95
	New pump station at the Boschendal lower reservoir to supply water to the new Boschendal upper reservoir	2	85
	New booster pump station for the Boschendal upper booster zone		
Klapmuts	New Klapmuts 2 pump station at the Klapmuts old reservoir	140	46
	New Klapmuts 3 pump station with a sump at the new connection point to the CoCT's Wemmershoek pipeline	165	80
	Three new booster pump stations for the high lying areas in the Klapmuts 3 reservoir zone	31	30
		6	30
		8	30
Raithby	Upgrading of the existing Raithby pump station will be required in the future when the new reservoir is built. The existing Raithby booster pump station will eventually become redundant.	8	45

## RESERVOIR INFRASTRUCTURE

The condition of most of the reservoirs in SM's Management Area is good and the reservoirs are well maintained. The overall storage factors of the reservoirs for the various towns, based on 1 x PDD (24 hours storage capacity), are 1.63 for Stellenbosch, 0.77 for Franschhoek, 0.72 for Dwarsrivier and 1.02 for Klapmuts.

Even though the town's overall storage capacity might be adequate there might be some distribution zones within the town's network with inadequate storage capacity, as identified through the Water Master Planning process and indicated in the table below.

Town	Recommendations included in the Water Master Plan	Capacity (MI)
Stellenbosch	A new reservoir is proposed at the existing Kayamandi reservoir site to augment reservoir storage for this larger zone.	5.000
	A new Boschendal reservoir is proposed for the new future development area AL3.	0.600
	A new reservoir should be constructed at the existing Cloeteville reservoir site, when additional storage capacity is required for Cloeteville.	2.000
Franschhoek	A new reservoir at the existing Groendal reservoir site is proposed	2.500
Dwarsrivier	A new Boschendal lower reservoir is proposed for the new Boschendal lower zone	1.000
	A new Boschendal upper reservoir is proposed for the new Boschendal upper and Boschendal upper booster zones.	0.150
	A new Dwars River reservoir is required for storage capacity for the Lanquedoc zone as well as the deficit in storage in the Pniel and Johannesburg reservoirs.	2.000
	A new reservoir at the Kylemore lower reservoir site	1.600
Klapmuts	A new reservoir is proposed for the new Klapmuts lower zone	10.000
	A new reservoir is proposed for the new future development areas north of the N1 (A new bulk connection to the CoCT's bulk supply pipeline from Wemmershoek with a sump, pump station and rising main is also proposed for supply to this reservoir).	15.000

Town	Recommendations included in the Water Master Plan	Capacity (MI)
Raithby	The EGL of the existing Raithby reservoir is too low relative to the supply zone and can therefore not supply enough pressure into the zone. A new Raithby reservoir is proposed at TWL = 150m nearby the Faure WTW. The existing reservoir should subsequently be decommissioned.	1.000

## WATER AND SEWER RETICULATION INFRASTRUCTURE

The Water Master Plan (February 2008) has indicated that based on the most likely land-use development scenario, the following further water reticulation infrastructure components will be necessary:

STELLENBOSCH
<ul style="list-style-type: none"> <li>The Kayamandi and Kayamandi PRV zones are increased to include future development areas K3 to K8.</li> <li>The Cloeteville reservoir zone is increased to include future development areas TN 10 &amp; TN 13.</li> <li>The boundaries between the Kleinvallei BPT and the Onder Papegaaiberg zones are adjusted.</li> <li>The boundaries of the existing zones are increased to accommodate future development areas.</li> </ul> <p>Two new zones are proposed for the future system, viz. the new Helshoogte zone for future development area AL3 and the new Jamestown booster zone for the high lying future development area J1.</p>
FRANSCHHOEK
<p>The only changes to the existing distribution zones are that the boundaries are increased to accommodate the future development areas and that a portion of the Franschhoek Bo-dorp zone is linked with a non-return valve and water meter to the Fransche Country Estate zone. This is proposed in order to ensure that the supply to the Franschhoek Bo-dorp subzone 1 can be augmented from the Fransche Hoek Estate zone during peak demand conditions.</p>
DWARSRIVIER
<ul style="list-style-type: none"> <li>A new Pniel PRV zone is implemented in the lower lying areas of the existing Pniel lower zone.</li> <li>The Kylemore lower and upper zones are increased to include the future development areas K1, K2 and B3.</li> <li>The boundaries of the existing zones are increased to accommodate future development areas.</li> </ul> <p>Four new zones are proposed for the future system, viz. the Boschendal lower, Boschendal upper, Boschendal upper booster and the Dwarsrivier reservoir booster zones. The two booster zones are for the high lying erven of future development areas B1 and B7.</p>
KLAPMUTS
<ul style="list-style-type: none"> <li>A new Klappmuts higher zone is proposed for the higher lying areas of future development area D as well as for future development area P. It is proposed that this zone is supplied from the existing New Klappmuts reservoir.</li> <li>The existing Klappmuts zone is enlarged to accommodate all the future development areas south of the N1. It is proposed that this zone is supplied from a new reservoir, viz. the Klappmuts lower reservoir at a TWL of 2330m.</li> <li>A new Reservoir 3 zone is proposed to accommodate all the developments north of the N1. This zone should be supplied from a new reservoir with a TWL of 230m.</li> <li>3 New booster zones are proposed for the high lying areas north of the N1 in the Reservoir 3 zone.</li> </ul>
RAITHBY
<ul style="list-style-type: none"> <li>It is proposed that a new reservoir is built on a higher level with one zone that replaces the existing Raithby and Raithby booster zones. The boundary of this zone is increased in order to accommodate all the proposed future development areas.</li> </ul>

The Sewer Master Plan (February 2008) has indicated that based on the most likely land-use development scenario, the following further sewer reticulation infrastructure components will be necessary:

<b>STELLENBOSCH</b>
<ul style="list-style-type: none"> <li>• One of the major upgrades requires is upgrading of the main gravity outfall sewer in the Adam Tas drainage area between Kayamandi and the Stellenbosch WWTW by constructing a parallel main outfall sewer next to the existing outfall sewer including diversion structures to divert flow into this new main sewer.</li> <li>• With all the densification in the Kromrivier and Central areas, upgrading of the collectors sewers in these areas will be required in future as capacity problems arise.</li> <li>• When the Techno Park pumping station reaches capacity, it is proposed that the Techno Park and Jamestown pump stations are abandoned and that the flows from these drainage areas are diverted to the existing De Zalze drainage area. The existing De Zalze pumping stations should also be abandoned and the sewage from this new drainage area (the Blaauwklippen drainage area) should gravitate along the Blaauwklippen River to the De Zalze 2 pumping station. From here a new rising main to the Stellenbosch WWTW should be constructed as well as an upgraded new pumping station.</li> <li>• It is also proposed that a new pumping station and rising main should be constructed for the new Stellenbosch Farmers Winery drainage area. This proposed Stellenbosch Farmers Winery pumping station and rising main could be combined with the proposed Blaauwklippen pumping station and rising main.</li> <li>• A number of existing outfall sewer require upgrading by replacement with larger sized future sewers.</li> </ul>
<b>FRANSCHHOEK</b>
<ul style="list-style-type: none"> <li>• New gravity outfall sewers are required to collect the sewage from future development areas SF4 and SF6.</li> <li>• A new pumping station and rising main is proposed for future development area SF9.</li> <li>• A number of existing outfall sewers require upgrading by replacement with larger sewers.</li> <li>• A new bulk outfall sewer between Franschhoek and Wemmershoek will be required when the new Regional WWTW is constructed at Wemmershoek.</li> <li>• A new 250mm dia bulk outfall sewer was recently commissioned between La Motte and Wemmershoek. This new sewer unfortunately does not have sufficient capacity for the flow from the entire Franschhoek. If the Franschhoek WWTW is decommissioned and all the flow is diverted through this pipeline, it should be upgraded to a larger diameter.</li> </ul>
<b>DWARSRIVIER</b>
<ul style="list-style-type: none"> <li>• A number of new outfall sewers are required to collect sewage from the new future development areas in the Dwars River area. As the new areas in Kylemore develop, the collector sewer between Kylemore and the Dwars River WTW should be upgraded.</li> <li>• A new Future Pump 1 drainage area is proposed for the future development areas north of the Pniel drainage area. A new pump station next to the Dwars River with a rising main to the Pniel pumping station should be constructed for this purpose.</li> <li>• It is proposed that a second pumping station and rising main is constructed for the areas north of the proposed Future Pump 1 drainage area which cannot gravitate to the new Future Pump 1.</li> <li>• When the new Future Pump 1 and rising main is constructed, the existing Pniel pumping station and rising main should be upgraded according to the master plan.</li> </ul>
<b>KLAPMUTS</b>
<ul style="list-style-type: none"> <li>• The existing drainage areas are increased to accommodate proposed future development areas.</li> <li>• A few existing outfall sewers require upgrading by replacement with larger sized sewers.</li> <li>• It is proposed that the existing Klapmuts 3 pumping station is downsized to a capacity of 18 l/s and that the existing Klapmuts 2 pumping station is upgraded to a capacity of 60 l/s.</li> <li>• Two new drainage areas, each with a pumping station (Klapmuts 4 and 5) and rising main, are proposed south of the N1 National route.</li> <li>• Three new drainage areas, each with a pumping station (Klapmuts 6, 7 and 8) and rising main, are proposed for the areas north of the N1 National route.</li> <li>• It is proposed that all the sewage of the areas north of the N1 National Route is collected at future Klapmuts 7 pumping station from where it should be pumped to the existing Klapmuts WWTW.</li> <li>• A strategic study to determine the feasibility of retaining the existing WWTW site for the entire development of Klapmuts should be performed. In the case of a new preferred site being identified, the bulk system should be adjusted in order to transfer sewage from the existing site and from Klapmuts 7 pumping station to this new site.</li> </ul>
<b>RAITHBY</b>
<ul style="list-style-type: none"> <li>• The existing drainage areas are increased to accommodate proposed future development areas.</li> </ul>

## SEWER PUMP STATIONS

The Sewer Master Plan (February 2008) has indicated that based on the most likely land-use development scenario, it will be necessary for the following sewer pump stations:

Town	Recommendations included in the Water Master Plan	Capacity (l/s)
Stellenbosch	New Stellenbosch Farmers Winery pump station	20
	Downsize existing Plankenburg pump station	11
	New De Zalze pump station	50
Franschhoek	New Franschhoek 1 pumping station	18
Dwarsrivier	Upgrade Pniel pump station	50
	New pumping station at FDA B2	5
	New pumping station at future pump 1	15
Klapmuts	Upgrade existing pump station 2	60
	New Klapmuts 4 pumping station	5
	Downgrade existing pump station 3	18
	New Klapmuts 5 pumping station	10
	New Klapmuts 6 pumping station	18
	New Klapmuts 7 pumping station	120
	New Klapmuts 8 pumping station	36

## WASTE WATER TREATMENT INFRASTRUCTURE

The table below gives a summary of the existing capacities and current flows at each of the WWTWs (Ml/day):

WWTW	Existing Capacity	Average Daily Flow (Period)	Average Dry Weather Flow (Period)	Average Wet Weather Flow (Period)
Stellenbosch	20.400	21.147 (Jul 2010 – Apr 2011)	20.593 (Oct 2010 – Mar 2011)	21.977 (Jul 2010 – Sept 2010, Apr 2011)
Franschhoek	2.000	1.787 (Jul 2010 – Apr 2011)	1.816 (Oct 2010 – Mar 2011)	1.743 (Jul 2010 – Sept 2010, Apr 2011)
Wemmershoek	0.550	0.174 (Jul 2010 – Apr 2011)	0.170 (Oct 2010 – Mar 2011)	0.179 (Jul 2010 – Sept 2010, Apr 2011)
Pniel	1.350	1.133 (Jul 2010 – Apr 2011)	1.095 (Oct 2010 – Mar 2011)	1.189 (Jul 2010 – Sept 2010, Apr 2011)
Klapmuts	0.800	0.495 (Jul 2010 – Febr 2011)	0.424 (Oct 2010 – Febr 2011)	0.614 (Jul 2010 – Sept 2010)
Raithby	0.400	0.326 (Jul 2010 – Apr 2011)	0.388 (Oct 2010 – Mar 2011)	0.232 (Jul 2010 – Sept 2010, Apr 2011)

SM revises on an annual basis the capacity and suitability of the WWTWs to meet the requirements of DWA and downstream users for the quality of the final effluent being discharged to the receiving water bodies (in this instance the Berg River and its tributaries). When the water quality requirements for the final effluent becomes stricter (As will be the case for the Franschhoek, Wemmershoek and Klapmuts WWTWs, which will have to meet the requirements of the Special Standard), and / or when the inflow to the WWTW has increased to such an extent that the capacity of the plant needs to be increase, then the Municipality appoints reputed consulting engineering firms to undertake feasibility studies to perform technical and economical evaluation of the different options available for upgrading or extending the capacity of the treatment works.

SM needs to identify funds in advance for the proposed projects and should only approve new developments once the necessary bulk infrastructure and the upgrading of the existing infrastructure, as identified in the Master Plans, are in place. SM needs to prioritize from the list of projects those items which can be implemented from the available funding for a particular financial year. SM needs to undertake revised master planning at least every three to five years and use the master plans to list the desired infrastructure development requirements, and reflect these in the IDP.

It is important for SM to place a high priority on demand management in order to postpone additional capital investment for as long as possible, both from the water availability perspective as well as from the treatment of increased effluent volumes (Implementation of the new WDM Strategy).

It is also important for SM to balance land-use and development planning (SDFs) in accordance with the availability of water and the capacity of WTWs and WWTWs that are in place or that will be implemented.

It is important for SM to develop an AMP from the recent developed Asset Register. The objective of an AMP is to support the achievement of the strategic goals of the Municipality and facilitate prudent technical and financial decision-making. It is also a vehicle for improved internal communication and to demonstrate to external stakeholders the Municipality's ability to effectively manage its existing infrastructure as well as the new infrastructure to be developed over the next 20 years.

This plan must be based on the principle of preventative maintenance in order to ensure that, as far as this is practical, damage to assets is prevented before it occurs. SM must ensure that the maintenance and rehabilitation plan is part of the WSDP and that the plan is implemented. Assets must be rehabilitated and / or replaced before the end of their economic life and the necessary capital funds must be allocated for this purpose.

Priority should be given to rehabilitating existing infrastructure as this generally makes best use of financial resources and can achieve an increased in (operational) services level coverage's most rapidly. The preparation of maintenance plans and the allocation of sufficient funding for maintenance are required to prevent the development of a large condition backlog. The potential renewal projects for water and sanitation infrastructure need to be identified from the Asset Register. All assets with a condition grading of "poor" and "very poor" need to be prioritised.

## OPERATION AND MAINTENANCE

### Status Quo:

The 2009/2010 Water Safety Plan of SM was recently updated (March 2011). A qualified, dedicated team was established by SM to compile their Water Safety Plan. A detailed risk assessment was executed and the existing control measures implemented by SM was summarised. The impact of each of the hazards or hazardous events were characterised by assessing the severity of the likely health outcome and the probability of occurrence. An Improvement / Upgrade Plan was compiled for all the existing significant risks, where the existing controls were not effective or absent. Each identified improvement was linked to one of the Water Safety Plan Team members to take responsibility for implementation together with an appropriate time frame for implementation of these controls.

The Water Safety Plan Team of SM is committed to meet regularly to review all aspects of the Water Safety Plan to ensure that they are still accurate. In addition to the regular three year review, the Water Safety Plan will also be reviewed when, for example, a new water source is developed, major treatment improvements are planned and brought into use, or after a major water quality incident.

A Compliance Monitoring Programme that meets the requirements of DWA as stipulated in the Blue Drop Criteria was drawn up by SM and is implemented by the Municipality. Bacteriological and Chemical samples are taken on a monthly basis.

The DWA launched the blue and green drop certification, with regard to drinking water quality and the quality of treated effluent discharged from WWTWs, at the Municipal Indaba during September 2008. Blue drop status is awarded to those towns that comply with 95% criteria on drinking water quality management. The Blue Drop Certification programme is only in its second year of existence and promises to be the catalyst for sustainable improvement of South African drinking water quality management in its entirety.

The blue drop performance of SM is summarised as follows in the DWA's 2010 Blue Drop Report:

Municipal Blue Drop Score	94.9%
<p><b>Regulatory Impression:</b> Once again Stellenbosch gave a sterling performance during the Blue Drop assessment. The Municipality certainly impressed by the thorough preparation which speaks volumes of its commitment towards drinking water quality management.</p> <p>The compliance figures did not measure well due to the few failures recorded over the assessment cycle, but overall compliance were improved when the bulk provider's (City of Cape Town) compliance figures were brought into the equation. There remains work to do in this regard on both microbiological and chemical compliance.</p> <p>Even though only slightly so, the municipality could not maintain its Blue Drop status for Franschhoek mainly due to compliance records for system not being up to standard.</p>	

BLUE DROP REPORT CARD		
Criteria	Stellenbosch and Idas Valley (CoCT)	Franschhoek (CoCT)
Water Safety Plan	C	C
Process Control & Maintenance Competency	A	A
Efficiency of Monitoring Programme	B	B
Credibility of Sample Analyses	A	
Data Submission to DWA	B	A
Compliance with National Standard	B	C
Failure Response Management	A	A
Responsible Publication of Performance	B	B
Efficacy of Asset management	A	A
Microbial DWQ Compliance with National Standard	99.00%* (12 months data)	98.60% (12 months data)
Chemical DWQ Compliance with National Standard	99.03%* (12 months data)	89.50% (12 months data)
Blue Drop Score 2010	95.02%	94.11%
Blue Drop Score 2009	94%	95%

Notes: \* Compliance determined from Municipal Overview (Including City of Cape Town DWQ compliance figures)

An Operational and Compliance Monitoring Programme that meets the requirements of DWA as stipulated in the Green Drop Criteria was drawn up by SM and is implemented by the Municipality. Operational samples are taken on a daily basis at all the WWTWs. The compliance samples that are taken on a monthly basis at all the WWTWs are analysed at accredited laboratories and monthly monitoring and inspection reports are compiled by WSSA for all the WWTWs.

SM implements an incident response protocol, in which certain reactive procedures are followed when an incident occurs (normally when a malfunction of the treatment processes occur due to power failures, faulty equipment, adverse weather conditions or human error).

There are two levels of incident management, firstly when final effluent is discharged that does not meet the requirements of the Water Act, and secondly when an event takes place causing a major pollution event for which emergency response is required. For serious incidents or emergency situations, additional actions and notifications are required, including notification of DWA and the media / public.

The DWA completed their First Order Assessment of Municipal Waste Water Treatment Plants, DWA's Green Drop Report for 2009, which provides a scientific and verifiable status of municipal waste water treatment. Green drop status is awarded to those WSAs that comply with 90% criteria on key selected indicators on waste water quality management.



The green drop performance of SM is summarised as follows in the DWA's 2009 Green Drop Report:

Average Green Drop Score	53%
<p><b>Regulatory Impression:</b> In terms of the overall Green Drop Assessment, the Municipality is performing less than satisfactory. Although most of the works require attention, Wemmershoek WWTW would appear to require more attention than the others. Generic improvement areas for all the works are compliance in terms of:</p> <ul style="list-style-type: none"> <li>• Registration and classification of the works as well as the operating staff,</li> <li>• WWQ Monitoring Programme Efficiency,</li> <li>• Regular submission of WWQ information to DWA,</li> <li>• WWQ compliance,</li> <li>• Management planning relating to the WWTW capacity (Klapmuts and Wemmershoek).</li> </ul> <p>A substantial adjustment by the WSA is required in relation to the above matters before the various works would qualify for Green Drop Status.</p>	

GREEN DROP REPORT CARD						
Criteria	Stellenbosch	Franschhoek	Klapmuts	Kylemore	Raithby	Wemmershoek
Process Control, Maintenance & Management Skill	E	E	E	E	E	E
Monitoring Programme Efficiency	E	E	G	B	B	E
Credibility of Waste Water Sample Analysis	A	A	A	A	A	A
Regular submission of Waste Water Quality Results to DWA	G	G	A	G	G	G
Waste Water Quality Compliance	D	D	D	E	E	E
Waste Water Failures Response Management	A	A	A	A	A	A
Waste Water Treatment Works Capacity	A	A	E	A	A	B
Green Drop Score	55%	55%	59%	52%	52%	47%

Gaps and Strategies:

Barriers implemented by SM against contamination and deteriorating water quality include:

- Catchment management and water source protection.
- Protection at points of abstraction such as river intakes, dams and boreholes (Abstraction Management).
- Correct operation and maintenance of WTWs (Coagulation, flocculation, sedimentation and filtration).
- Protection and maintenance of the distribution system. This includes ensuring an adequate disinfectant residual at all times, rapid response to pipe bursts and other leaks, regular cleaning of reservoirs, keeping all delivery points tidy and clean, etc.

Three other important barriers against poor quality drinking water that are a prerequisite to those listed above are:

- A well informed Council and municipal managers that understand the extreme importance of and are committed to providing adequate resources for continuous professional operation and maintenance of the water supply system.
- Competent managers and supervisors in the technical department who are responsible for water supply services lead by example and are passionate about monitoring and safeguarding drinking water quality.

- Well informed community members and other consumers of water supply services that know how to protect the water from becoming contaminated once it has been delivered, that have respect for water as a precious resource and that adhere to safe hygiene and sanitation practices.

The knowledge, skills, motivation and commitment of staff involved in the management of drinking water quality are the most important factors that determine the ability of SM to deliver safe and reliable water. Training of all staff involved in water supply services on matters related to treatment processes and quality monitoring and control is essential because their actions (or failure to act) will have a major impact on the well-being of the communities.

SM is committed to work with the DWA and the other role-players in order to improve on their 2010 Blue Drop Score for the various distribution systems. The improvement / upgrade plan will be implemented in order to address the potential risks identified through the Water Safety Plan process.

It is important for SM to classify all WWTWs and operators along the lines of the regulations by establishing a programme for certification of works, operators, technicians and managers. SM is also committed to manage and operate sewage pump stations effectively to prevent any possible spillages. The Municipality needs to continue with the upgrading of WWTWs when necessary, in order to reduce the risk of source contamination. The WWTWs will be managed and operated to comply with the permitted standards.

The Occupational Health and Safety Act contain provisions directing employers to maintain a safe workplace and to minimize the exposure of employees and the public to workplace hazards. It is therefore important for SM to compile a Legal Compliance Audit for their WWTWs, which will provide the management of SM with the necessary information to establish whether the Municipality is in compliance with the legislation or not.

Various mechanisms were put in place over the last year, after the assessment, in order to increase SM's Green Drop performance and to get the Municipality ready for the next round of assessments. SM is committed to work with the DWA and the other role-players in order to improve on their 2010 Green Drop Score for the various WWTWs and to get the Municipality ready for the next round of assessments. SM is also committed to address the following, in order to reduce their current CRR.

- Forward planning and upgrading / refurbishment of treatment plants to ensure adequate capacity for the flows received;
- Operate and maintain the WWTWs within design- and equipment specifications;
- Have trained, qualified and registered staff in place;
- Get mentoring / coaching contracts in place where there is a great demand for adequately skilled process controllers and supervision;
- Monitoring of flow to- and from the plants;
- Sampling and monitoring of effluent quality;
- Appropriate authorisation in accordance with the National Water Act (36 of 1998); and / or
- Where plant is overloaded, introduce unorthodox methods to ensure enhancement of effluent quality.

The following steps are implemented by SM in order to improve on their Green Drop Performance, as included in the RRAP.

- The industrial monitoring programme is being evaluated and improvements are being implemented in order to ensure that all industries that have a significant effect on the WWTWs are being monitored continuously.
- A stormwater and river quality monitoring programme is in place.
- An assistant superintendent has been dedicated (As his sole responsibility) towards the operation of discharges from private and in-house sewage tanker services and sewage pump stations, to ensure strict control of septic discharges, as well as efficient operation of the pump stations and rapid response, should these pump stations fail.
- A dedicated sludge handling and compost team have been initiated that would operate independently from the WWTW. They will ensure that the sludge is efficiently handled and turned into commercially sold compost at all the works.
- Internal and external training programmes have been implemented according to DWA's guidelines to train plant operators.
- Safety audits of all WWTWs will be compiled to establish steps to be implemented to ensure compliance with the OSH-Act.
- Re-shuffling of personnel within the sanitation section has been initiated to ensure that all WWTWs have sufficient personnel on site to execute day to day operations.
- Composite sampling has been re-introduced on all plants and analysed daily to ensure more efficient process operation. The Water Lab is also being extended to handle the higher load.
- A Public Relations Campaign will be implemented to ensure that a climate of transparency and good service w.r.t. the situation of sewage collection and treatment is established in the Stellenbosch Municipal area. The public will be encouraged to report spills, pump stations that are flowing over, etc. The Municipality, in turn, will measure its response to these reports according to a predefined scoreboard which will be published in the Local Press on a weekly basis.
- 2010/2011 Approved Capital Budget for sanitation is R 64.585M (R20M for Stellenbosch WWTW, R7M for Franschoek WWTW and R15M for Wemmershoek WWTW, R9M for compost / de-watering plant – to be commissioned 31 Aug 2010).
- 2010/2011 Approved operational budget for sanitation is: Stellenbosch WWTW - R20M, Composting - R1.3M, Klamputs WWTW - R0.32M, Franschoek WWTW - R1.05M, Pniel WWTW - R1.01M and Raithby and Wemmershoek WWTW - R0.65M.
- On-going communication with the Councillors, new Technical Director and Other Managers is taking place in anticipation of the MOA to be formalised by DWA, which would be incorporated into the IDP.

## ASSOCIATED SERVICES

### Status Quo:

All the schools, hospitals and clinics in SM's Management Area have adequate water and sanitation services.

Gaps and Strategies:

The environmental health function is currently with the Cape Winelands District Municipality. Typical functions with the Cape Winelands District Municipality with regard to health services include the following:

- Households to meet the minimal health safety requirements
- Monitoring water quality
- Waste management
- Food control
- Schools to meet health requirements
- Contagious disease control
- Community development: Making communities aware of environmental health issues and communicates with farm workers regarding sanitation services.

The Municipal Health Services of the Cape Winelands District Municipality also report monthly to the Department of Environmental Health on water quality. The quality of life of the people within a Municipality is influenced by the available health care. Various things influence the health conditions of people in any region, for example access to clean water, good sanitation, proper nutrition and adequate housing.

It is important that a co-operative relationship exist between the Cape Winelands District Municipality and SM with regard to environmental health issues and that a proper communication system between the District Municipality and SM be developed.

The most vulnerable groups within SM's Management Area are the persons living in informal areas with shared services. It is therefore of outmost importance that the communal standpipes are properly maintained, to promote better health and hygiene among users. It is necessary to:

- keep the standpipe area clean and free from stagnant water;
- avoid water spillage by keeping the tap closed when not in use;
- report and rectify leakages immediately;
- keep straying animals away from standpipe area; and
- keep the tap outlet, standpipe slab and soak away clean.

Promote health and hygiene awareness amongst standpipe users by focusing on the following:

- users must use the standpipe only for the filling of containers;
- no body or clothes washing is allowed at standpipes;
- no house pipes or other objects may be attached to the standpipes;
- use clean containers and close containers with a suitable lid when transporting water;
- disinfect containers when necessary; and
- immediately report any irregularities, contamination, tampering or vandalism at standpipes.

It is important that the basic services backlogs that still exist on the farms be eradicated by SM. The supply of basic sanitation services on the farms needs to be linked to the provision of health and hygiene education. Improved health requires behaviour change, which also cannot be achieved with a single health education talk given by an outside expert. Behaviour change requires sustained monitoring and promotion within the community. This is the key-function of the community health workers employed on sanitation projects.

SM needs to continue to actively engage with service providers and NGO's in the fight against illnesses such as HIV/Aids and TB. A solution to the sustainability of the community health worker's position and employment within the community has been to link their position and function to the activities of the Department of Health. In addition support can be provided to the Community Health Workers through local clinics and through the programmes of the EHPs. Education on the HIV/Aids pandemic would play a key role in stemming the spread of the disease.

## CONSERVATION AND DEMAND MANAGEMENT

### Status Quo:

The implementation of WC/WDM interventions in SM has been limited, primarily due to a lack of human resource capacity to undertake the necessary work and the budget constraints. A five block step tariff system is implemented by the Municipality, which discourage wasteful or inefficient use of water. The DWA also currently supports the Municipality with the development of a detail WDM Strategy that can be implemented.

All surface water sources and the water received from the CoCT are supplied with bulk water meters, which are read monthly. The establishment of comprehensive water management zones will enable the Municipality to better monitor and manage their non-revenue water. SM is currently busy with a telemetry contract to include all bulk meters in their telemetry system. The reading of Consumer meters is done by the Finance Department on a monthly basis.

A detail water meter audit of all the bulk and consumer water meters still needs to be done for SM. The audit entails the survey of all the bulk and consumer water meters, including the development of a Meter Maintenance and Management Strategy.

Water losses can be determined more accurately with good bulk and zone water meters and ensuring that these meters are read regularly. With a good water loss monitoring system in place SM will be in a position to implement the proposed WDM activities and WDM Strategy, which is currently being developed. It will also enable the Municipality to address the specific problems causing water losses.

The main water demand management interventions implemented by SM, over the last few years, are as follows:

- Implement a five block step water tariff structure that promotes the efficient use of water and discourage wastages.
- Increasing public awareness (Pamphlet distribution with municipal accounts and media coverage via local newspapers and radio, participation in Water Week).
- Meter and record all bulk water supply, improve quality of data regarding monthly consumer use and started with the implementation of district metered areas in order to carry out more detail water balances for the various areas.
- Started with the process of upgrading the water telemetry system, in order to monitor the flows of the bulk water meters more accurately.
- Started with the process of identifying specific zones for the installation of bulk zone meters.

A WDM Strategy was also drafted for SM in November 2007 by CES, with funding support from the DWA. The purpose of the Strategy was to further conserve and protect available resources and to ensure the effective utilisation of the available water resources. There are a host of activities that SM could embark to ensure more efficient use of water, as identified through the developed WDM Strategy (November 2007). These can be classified according to the following five categories:

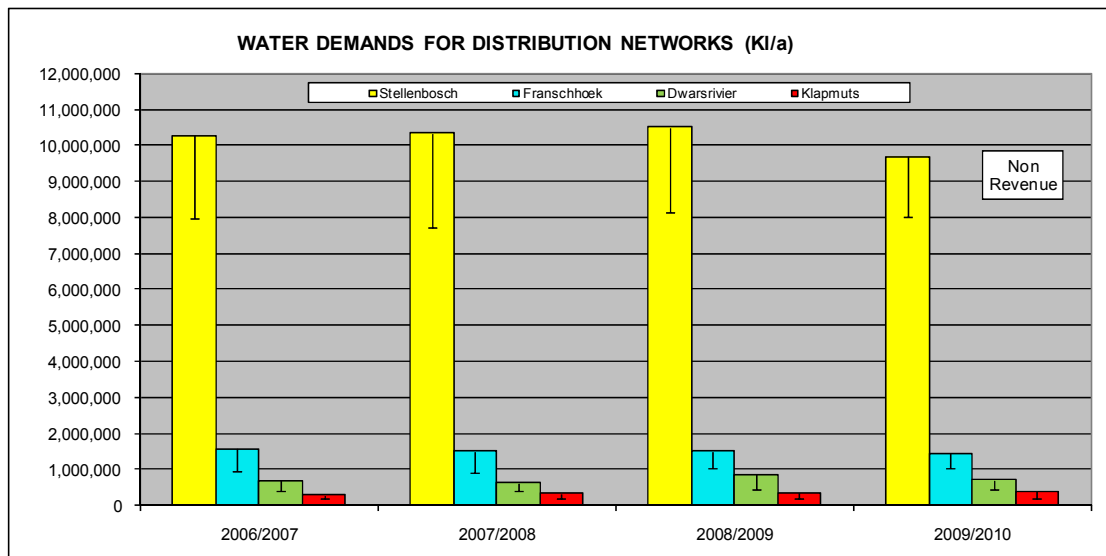
- CAFES-pricing policy programme
- Leakage Management Programme (Distribution Management)
- Socio-political programme (Consumer / End-user Demand Management)
- Water Conservation products.
- Reuse of wastewater (Effluent / Return Flow Management)

The WDM priority areas, as included in the previously draft WDM Strategy (November 2007), were as follows:

Distribution System	Tariff Adjustment	Water loss management	Pressure Management	Schools WDM	Reuse of wastewater
Stellenbosch	Medium	Medium	Low	High	Medium
Franschhoek	Medium	Medium	Low	High	Medium
Klapmuts	Medium	Low	High	High	Low
Dwarsrivier	Medium	Low	Low	High	Low
Raithby	Medium	Low	Low	High	Low

Most of the current WDM activities implemented by SM are funded through their O&M budget. The upgrade and replacement of infrastructure is funded through their Capital budget, which include the rehabilitation of certain sections of the water network.

The graph below gives an overview of the total bulk water supply and non-revenue water for the various distribution systems in SM’s Management Area.



The Infrastructure Leakage Index (ILI) is the most recent and preferred performance indicator for comparing leakage from one system to another. It is a non-dimensional index representing the ratio of the current real leakage and the “Unavoidable Annual Real Losses” (UARL). A high ILI value indicates poor performance with large potential for improvement while a small ILI value indicates a well-managed system with less scope for improvement. Attaining and ILI = 1 is a theoretical limit which is the minimum water loss in an operational water reticulation system.

The table below gives a summary of the ILI and the non-revenue water for the various distribution systems, as calculated through the WSDP process.

Distribution System	Unit	Current 09/10	Estimate Year 5	Record : Prior (Ml/a)				
				08/09	07/08	06/07	05/06	04/05
Stellenbosch	Volume	1 669.066	1 656.042	2 358.780	2 610.936	2 287.991		
	Percentage	17.2	15.0	22.4	25.3	22.3		
	ILI	2.80						
Franschhoek	Volume	403.508	323.249	455.606	593.905	600.680		
	Percentage	27.7	20.0	30.3	39.2	38.4		
	ILI	4.16						
Dwarsrivier	Volume	254.501	179.378	406.622	212.503	265.504		
	Percentage	35.4	25.0	47.1	33.9	38.9		
	ILI	2.91						
Klapmuts	Volume	176.591	86.552	169.742	152.140	115.809		
	Percentage	45.6	25.0	47.3	44.8	39.7		
	ILI	7.61						
Total	Volume	2504	2 245.221	3392	3570	3271		
	Percentage	20.5	16.4	26.6	27.9	25.5		
	ILI	3.14						

Note: Infrastructure Leakage Index (ILI) = 1 – 2: Excellent, 2 -4: Good, 4 - 8: Poor, 8>: Very Poor

The losses per distribution system, as identified through the WSDP process, and the priority areas, as included in the draft WDM Strategy (November 2007), can be summarised as follows:

- Stellenbosch: Very low percentage of non-revenue water of 17.2% exists, which will decrease even further with improvement of the metering of bulk water entering the system. The ILI value of 2.80 falls in category B (Good) benchmark for developed counties. This value should decrease further with an improvement of metering of the system.
- Franschhoek: The percentage of non-revenue water decreased over the past 4 years to less than 30%. The ILI value of 4.16 falls on between category B (Good) and category C (Poor) for developed countries. The implementation of WC/WDM can improve this value.
- Klapmuts: The percentage of non-revenue water of 45.6% is very high and the implementation of WC/WDM measures to reduce this value should be a priority. . The ILI value of 7.61 falls in category C (Poor) benchmark for developed counties. WC/WDM measures must be implemented to improve this value to a more acceptable level.
- Dwarsrivier: The percentage of non-revenue water of 35.4% is high and needs to be reduced over the next 5 years. . The ILI value of 2.91 falls in category B (Good) benchmark for developed counties. This value shows a well managed bulk and distribution system.

Gaps and Strategies:

SM is committed to implement the previously proposed WDM Strategy and the newly developed WDM Strategy once finalised, in order to reduce the water losses within the various distribution systems as follows:

Distribution System	09/10 (%/a)	2015 (%/a)	2035 (%/a)
Stellenbosch	17.2 (Distribution)	15	15
Franschhoek	27.7 (Distribution)	20	15
Klapmuts	45.6 (Distribution)	25	20
Dwarsrivier	35.4 (Distribution)	25	20

The implementation phases recommended in the previous WDM Strategy were as follows:

COMPONENT	CHRONOLOGICAL STEPWISE APPROACH
CAFES cost and pricing strategy (CPP)	<ol style="list-style-type: none"> <li>1) Clean billing data, update SWIFT, verify / address metering and non-payment</li> <li>2) Introduce IBR structure to all residential consumers, but limit price change</li> <li>3) Set IBR structure = 6 blocks, min / max steps for 6 kl / month / 100 kl / month</li> <li>4) Set price of water in max block (above 100 kl/month) to at least R15 / kl</li> <li>5) Introduce informative billing</li> </ol>
Leakage management programme (LMP)	<ol style="list-style-type: none"> <li>1) Measure water volume that is lost                             <ol style="list-style-type: none"> <li>1a) Raw water supply and treatment</li> <li>1b) Distribution system</li> <li>1c) End user meter problems</li> </ol> </li> <li>2) Identify and quantify losses                             <ol style="list-style-type: none"> <li>2a) Raw water supply and treatment</li> <li>2b) Distribution system</li> <li>2c) End user meter problems</li> </ol> </li> <li>3) Conduct operational and network audit                             <ol style="list-style-type: none"> <li>3a) Raw water supply and treatment</li> <li>3b) Distribution system</li> <li>3c) End user meter problems</li> </ol> </li> <li>4) Improve performance: upgrade network, design action plans</li> <li>5) Sustain performance with good staffing / organisation structures</li> </ol>
Socio-political programme (SPP)	<ol style="list-style-type: none"> <li>1) Schools WDM programme</li> <li>2) Public awareness programme</li> <li>3) Non-payment issues</li> <li>4) Encourage users to implement WCP at their own expense</li> </ol>
Water conservation products (WCP)	<ol style="list-style-type: none"> <li>1) Repair on-site (plumbing) leaks</li> <li>2) Reduced toilet flush volume</li> <li>3) Xeriscaping garden areas (water wise gardening)</li> <li>4) Other methods to reduce consumption by changing human habits</li> </ol>
Reuse of waste water (RWW)	<ol style="list-style-type: none"> <li>1) Identify large water consumers</li> <li>2) Communicate advantages / incentives of reuse practice to large consumers</li> <li>3) Information gathering on current status of reuse measures</li> <li>4) Installation of reuse practice</li> <li>5) Monitor future water consumption</li> </ol>

SM status with regard to the implementation of the proposed WDM Strategy and the future phases are summarised in the table below.

IN PLACE	FIRST PHASE	SECOND PHASE	LATER
LMP1, LMP2	LMP3	LMP4	LMP5
CPP1, CPP2	CPP3	CPP4	CPP5
	SPP1	SPP2	SPP3-4
-	WCP1	WCP2	WCP3-4
RWW1	RWW2, RWW3	RWW4	RWW5

Some specific items of the WDM Strategy are considered to hold significant promise. These items should receive priority and are the backbone of the SM's WDM Strategy.

- Meter and record bulk water supply.
- Improve quality of data regarding consumer use (monthly).
- Initiate a WDM communication campaign to report on what the Municipalities have achieved (Lead by example).
- Immediately implement the CAFES-pricing policy programme for residential use by conducting a detailed price elasticity study, applicable to SM.



- Extend the implementation of the CAFES-pricing policy by a) evaluating the impact of price changes in different Western Cape municipalities and b) implementing a new pricing / tariff structure where the first block is free and the last block is charged at a rate which severely discourages use above 100 kl/month.
- Investigate water saving at sports grounds by means of purified sewerage water irrigation.
- Implement a schools WDM programme.
- Implement water saving by individual large water users through reuse of wastewater.
- Monitor progress of the WDM process.

It is also important for SM to ensure that all internal zone bulk water meters and all other bulk water meters are read on a monthly basis. The bulk meters and meter chambers also need to be properly maintained and the meters need to be protected from vandalism.

The WDM Strategy can only be effective if it is implemented correctly and effectively. Institutional resources (staff) and training are essential in this regard and should be addressed as part of a separate study regarding the human resources required to implement the strategy.

SM needs to align their current WDM activities with the activities included in the proposed WDM Strategy and needs to allocate adequate funding towards the implementation of these activities. Key WDM projects to be taken into account during the capital budgeting process are as follows:

- Replacement of old water networks (Areas with regular pipe bursts)
- Replacement of old bulk and consumer water meters (Meter replacement programme)
- Telemetry systems to provide for early warning
- Installation of zone meters
- Pressure Management
- Leak detection
- Data loggers to establish MNFs

The following goals and strategies are set by SM with regard to the water balances for the various distribution systems.

- The non-revenue water and future water demand projection models developed for the various distribution systems will be managed by SM on a monthly basis and the non-revenue water will be reduced further through the implementation of the developed WDM Strategy.
- SM will ensure that all water utilized is metered (parks, standpipes, etc).
- SM will ensure that all the bulk water meters are read and recorded on a monthly basis.
- SM will ensure that the influent at all the WWTWs is metered and that the quantity of treated effluent re-used and the quantity of water returned to the Water Resource System are also metered.

## WATER RESOURCES

### Status Quo:

The **Stellenbosch** area is supplied with raw water from mainly two sources, namely the Eerste River and the Western Cape Water Supply System. Water from the Eerste River in the Jonkershoek Valley is diverted by means of a weir and a gravity pipeline to two off-channel storage dams in Idas Valley. The registered abstraction from this source is 7.224 Mm<sup>3</sup>/a.

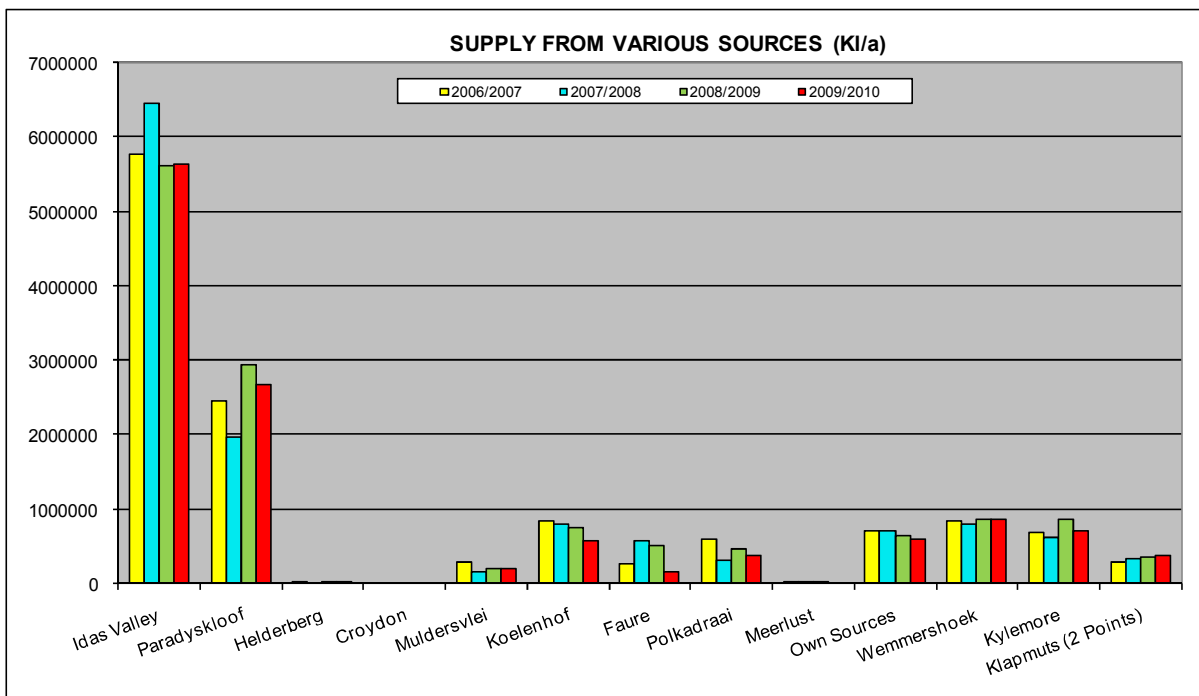
During the summer water is being drawn from the WCWSS. This is obtained by a pipeline leading from the Stellenboschberg Tunnel outlet to the Paradyskloof WTWs. A volume of 3 Mm<sup>3</sup>/a is available from this source.

**Franschhoek** which includes the smaller settlements of Groendal, La Motte, Wemmershoek and Robertsvlei is currently supplied with water from local sources in the catchments of the Mount Rochelle Nature Reserve and Perdekloof and with water purchased from the Wemmershoek Dam. The licensed abstraction from the perennial streams in the Mount Rochelle Nature Reserve is 0.221 M m<sup>3</sup>/a, from the Perdekloof Weir 0.577 M m<sup>3</sup>/a and from the Du Toits River 0.104 M m<sup>3</sup>/a.

**Dwarsrivier:** Pniel, Kylemore, Lanquedoc, Johannesdal and Groot Drakenstein receive treated water from the Wemmershoek Scheme. The local sources, which is currently not in use, include the Pniel Mountain Stream (0.053 M m<sup>3</sup>/a), Pniel Spring (0.025 M m<sup>3</sup>/a), and the Pniel Kloof Street Borehole (0.079 M m<sup>3</sup>/a).

**Klapmuts** is supplied with treated water from the Wemmershoek Dam, which forms part of the WCWSS.

The graph below gives an overview of SM's total annual bulk water supply from the various off-take points on the WCWSS and the other sources.



SM actively implements their Drinking Water Quality Sampling Programme in order to promptly identify water quality failures and to react accordingly. The water quality results are loaded onto DWA's BDS via the internet. Once entered the data is automatically compared to SANS241. This real-time system allows for immediate intervention to rectify any problems.

Up to present it was not necessary to take any steps to inform the consumers of any health risk regarding the potable water supplied by SM. The Municipality however got specific Safety Management Procedures in place, to inform its consumers about any potential health risks regarding the water quality, should it become necessary.

A Disaster Management Plan for the Cape Winelands Region is also in place, which confirms the arrangements for managing disaster risk and for preparing for- and responding to disasters within the Cape Winelands Region as required by the Disaster Management Act.

All the industrial effluent discharged from the “wet” industries into the sewerage systems of SM is treated at the various WWTWs. The volumes and nutrient loads of industrial effluent discharged by “Wet” industries in SM’s Management Area are monitored by SM on a monthly basis. Many smaller industries also discharge their wastewater to the municipal WWTWs, but these are not monitored from a volumetric perspective. Only nutrient loading is taken into account and as such, records of the volumes discharged to the WWTWs are not kept.

Gaps and Strategies:

**Water Resources:** Metering of all water demand is one of the most significant steps in order to properly plan and manage water sources. Without metering no management is possible. SM needs to ensure that all the existing bulk water meters are read on a monthly basis at least.

The water requirement for the SM is increasing more than expected and the existing water sources will not be adequate for the next five years. The Municipality is therefore currently busy with the investigation of additional sources of water supply as a matter of urgency.

The table below gives an overview of the years in which the annual water demand is likely to exceed the total allocations from the various resources, with the supply from the WCWSS kept at the maximum annual supply over the last four years.

Distribution System	Total Allocation (MI/a)	Annual Growth on 2010 Demand (Percentage growth)	Annual Growth on 2010 Demand (Percentage growth)	WSDP Projection Model
Stellenbosch	12 224.000	2014 (6%)	2016 (4%)	2016
Franschhoek	1 761.080	2012 (6%)	2013 (4%)	2016
Dwarsrivier	860.000	2014 (6%)	2017 (4%)	2018
Klapmuts	390.000	Over	Over	Over

The potential future water resources for the various towns are summarised in the table below, as taken from DWA’s Reconciliation Strategy documents.

Distribution System	Option	Potential
Stellenbosch	Re-use of water	<ul style="list-style-type: none"> <li>The existing WWTW is currently providing re-use water for irrigation purposes to some nearby farm holdings.</li> <li>One option is dual reticulation systems for new developments, where re-use water could be considered for irrigation purposes.</li> <li>Summer irrigation of tow nearby golf courses, namely the Stellenbosch Club (2 MI/d) and the De Zalze Golf Estate (2.5MI/d). Currently both these golf courses obtain irrigation water from the water derived from the Theewaterskloof scheme.</li> <li>Direct use (potable consumption) should be seen as a long-term intervention.</li> <li>Compliance with the General Limit of the WWTW is not always consistent and this creates problems for its re-use potential. The Works must be upgraded, firstly to cater for future growth in the area and then to guarantee an acceptable TSE quality.</li> </ul>
	Groundwater	<ul style="list-style-type: none"> <li>The current boreholes in the greater Stellenbosch town area are used mainly for the irrigation of sports fields and other open spaces, as well as for the municipal nursery. Future green spaces and agricultural zones (golf course developments, vineyard estates, etc.), as well as current green spaces not using groundwater, could be irrigated the same way using local boreholes.</li> <li>Stellenbosch will have to investigate far-field groundwater options in the TMG. This could</li> </ul>

Distribution System	Option	Potential
		be in the form of updated licence agreements with the City of Cape Town, to make use of groundwater from the possible future large-scale production of the TMG aquifers in the Theewaterskloof and Steenbras areas, or its own undertaking of a far-field TMG groundwater exploration project.
	Surface Water	<ul style="list-style-type: none"> <li>The newly completed Berg River Dam is a potential option. Water from this dam will be considerably more expensive than existing sources, so it is imperative to implement WC/WDM measures to limit, as much as possible, the volume purchased from this source. An application must be made to DWA for a license from this source.</li> </ul>
	Other Sources	<ul style="list-style-type: none"> <li>Rainwater harvesting is a suitable option for the area considering the high MAP in the area.</li> </ul>
	Summary	<ul style="list-style-type: none"> <li><b>Implement WC/WDM measures to reduce the percentage of non revenue water.</b></li> <li><b>A share in the future schemes for the WCWSS.</b></li> <li><b>Allocation of water from the Berg River Dam.</b></li> <li><b>Increased diversion from the Eerste River and water stored off-channel.</b></li> <li><b>Reallocation of "lei" water</b></li> </ul>
Franschhoek	Re-use of water	<ul style="list-style-type: none"> <li>The existing WWTW currently provides a small amount of re-use water as irrigation water to the nearby farm holdings and for recreational purposes.</li> <li>The Municipality should aim to supply re-use water to all future developments for irrigation purposes and should also ensure a 95% assurance of supply in terms of quality requirements. The option of dual reticulation systems for new developments should also be considered, where re-use water could be considered for irrigation purposes.</li> <li>Direct use (potable consumption) should be seen as a long-term intervention.</li> </ul>
	Groundwater	<ul style="list-style-type: none"> <li><b>First Option:</b> Targeting the Quaternary alluvial and / or basement regolith aquifers in the near vicinity of the various settlements. Yields are likely to be in the region of 1-5 l/s, provided the right geological structures and conditions are targeted i.e. contact zone between the Cape Granite Suite and Malmesbury Group and thick regolith in the basement aquifers; thick gravel zones in the Quaternary aquifers; and the presence of fractures linked to TMG recharge zones in both.</li> <li><b>Second Option:</b> Target the TMG north-west of Groendal and La Motte, to the north of the La Motte Fault. The Skurweberg Formation aquifer is accessible in an unconfined state, whereas the Peninsula Formation may be accessible in a confined state. Relatively high yields between 5-10 l/s with good water quality can be expected, if the right geological structures e.g. fractures and fault zones are targeted.</li> <li><b>Third Option:</b> Making use of the CoCT TMG project's Wemmershoek groundwater exploration area, in association with the City (Provided the current licence agreement was altered to include groundwater use).</li> <li>The first two options might impact on existing water users but the third one should be considered.</li> </ul>
	Surface Water	<p>The following surface water options currently form part of the WCWSS and are considered high priority options in the short to medium-term for Franschhoek:</p> <ul style="list-style-type: none"> <li>Apply for additional water allocation from the Wemmershoek Dam.</li> <li>Apply for an additional water allocation from the Berg River Dam.</li> <li>Apply to obtain water directly from the tunnel system.</li> </ul> <p>For the latter two options water treatment works would be needed.</p>
	Other Sources	<ul style="list-style-type: none"> <li>Rainwater harvesting is a feasible option on a small scale. The long hot summers make it impractical as a single source.</li> </ul>
	Summary	<ul style="list-style-type: none"> <li><b>Implement WC/WDM measures to reduce the percentage of non revenue water.</b></li> <li><b>A further allocation from the Wemmershoek Dam.</b></li> <li><b>Re-use of water</b></li> <li><b>Groundwater development</b></li> <li><b>Rainwater harvesting</b></li> </ul>
Dwarsrivier	Re-use of water	<ul style="list-style-type: none"> <li>The Municipality should aim to supply re-use water to all future developments for irrigation purposes and should also ensure a 95% assurance of supply in terms of quality requirements. The option of dual reticulation systems for new developments should also be considered, where re-use water could be considered for irrigation purposes.</li> <li>Direct use (potable consumption) should be seen as a long-term intervention.</li> </ul>
	Groundwater	<ul style="list-style-type: none"> <li>Groundwater is used in the Dwars River region by both Pniel, Lanquedoc and Kylemore, as well as numerous farms in the area. Yields are expected to be in the range of 1-5 l/s, with moderate water quality. A 5 l/s wellfield in the vicinity of each town would meet the predicted future shortfalls.</li> </ul>

Distribution System	Option	Potential
		<ul style="list-style-type: none"> <li>If more water is required in the future than predicted, far field TMG groundwater resources near Wemmershoek could be explored in association with the CoCT TMG groundwater exploration project.</li> </ul>
	Surface Water	<p>The following surface water options currently form part of the WCWSS and are considered surface water options for Dwarsrivier.</p> <ul style="list-style-type: none"> <li>Apply for additional water allocation from the Wemmershoek Dam, but likely water will be supplied at the price of the Berg River Dam's tariff.</li> <li>Draw water directly from the Tunnel system as the local Water User Association, of which the Dwars River towns are members, already do.</li> <li>The newly completed Berg River Dam is also a potential option. Water from this dam will be expensive.</li> </ul>
	Other Sources	<ul style="list-style-type: none"> <li>Rainwater harvesting is a feasible option.</li> </ul>
	Summary	<ul style="list-style-type: none"> <li><b>Implement WC/WDM measures to reduce the percentage of non revenue water.</b></li> <li><b>A further allocation from the Wemmershoek Dam.</b></li> <li><b>A water allocation from the Berg River Dam</b></li> <li><b>A water allocation from the Tunnel System.</b></li> <li><b>Re-use of water</b></li> <li><b>Groundwater development</b></li> <li><b>Rainwater harvesting</b></li> </ul>
Klapmuts	Re-use of water	<ul style="list-style-type: none"> <li>The existing WWTW currently provides a small volume of treated effluent as irrigation water to downstream users. The option of water re-use must be considered, in specific, during the planning and design phase of the new Klapmuts WWTW.</li> </ul>
	Groundwater	<ul style="list-style-type: none"> <li>Groundwater from the intergranular and fractured regolith basement and Quaternary alluvial aquifers is currently used by a number of farms in the immediate region surrounding Klapmuts. Yields are in the range of 0.5-2 l/s. Higher yielding boreholes may be intersected along the faulted contact zone between the Klipheuvel Group and Cape Granite Suite.</li> <li>It is unlikely that boreholes in the basement regolith and Quaternary alluvial aquifers will be able to supply more than 20 l/s sustainably, hence if extensive development in the area is to occur, far-field groundwater resources will be required.</li> </ul>
	Surface Water	<p>The following surface water options currently form part of the WCWSS and are considered surface water options for Klapmuts.</p> <ul style="list-style-type: none"> <li>Application for an additional water allocation from the Wemmershoek Dam.</li> <li>The newly completed Berg River Dam also becomes a potential option especially if it is combined with future development options by the CoCT.</li> </ul>
	Other Sources	<ul style="list-style-type: none"> <li>Rainwater harvesting is a feasible option.</li> </ul>
	Summary	<ul style="list-style-type: none"> <li><b>Implement WC/WDM measures to reduce the percentage of non revenue water.</b></li> <li><b>A further allocation from the Wemmershoek Dam.</b></li> <li><b>Re-use of water</b></li> <li><b>Groundwater development</b></li> </ul>
Jamestown	Re-use of water	<ul style="list-style-type: none"> <li>The sewage collection from Jamestown and the WWTW should be upgraded before any re-use can be considered.</li> <li>As suggested this water will then be treated at the Stellenbosch WWTW and can be re-used there.</li> </ul>
	Groundwater	<ul style="list-style-type: none"> <li>Near and far field groundwater options exist for Jamestown. Relatively high yields between 2-5 l/s can be encountered. A 2 l/s borehole would meet all predicted shortfalls in Jamestown.</li> <li>In the event for further extensive development, groundwater from the possible future large-scale production of the TMG aquifers in the Theewaterskloof and Steenbras areas for the CoCT could be used as a far-field option (Provided the current licence agreement is updated).</li> </ul>
	Surface Water	<ul style="list-style-type: none"> <li>Jamestown will remain dependent on this system for any future surface water options.</li> </ul>
	Other Sources	<ul style="list-style-type: none"> <li>Rainwater harvesting is not a feasible stand alone option due to the hot dry summers but can be used for individual homes.</li> </ul>
	Summary	<ul style="list-style-type: none"> <li><b>Implement WC/WDM measures to reduce the percentage of non revenue water.</b></li> <li><b>Increase the volume purchased from the CoCT</b></li> </ul>
Raithby	Re-use of water	<ul style="list-style-type: none"> <li>The re-use of water is not financially feasible because of the small quantity of treated</li> </ul>

Distribution System	Option	Potential
		effluent.
	Groundwater	<ul style="list-style-type: none"> <li>Near and far field groundwater options exist for Raithby. If the right basement structures are targeted, yield between 0.5-2 l/s can be encountered. A borehole of 1 l/s would meet all predicted shortfalls for Raithby.</li> </ul>
	Surface Water	<ul style="list-style-type: none"> <li>The current supply is from the CoCT which is supplied directly from the Faure WTW. If the town's water requirements increase, this source will remain the preferred supplier of treated water and this is further supported by its close proximity to the Faure WTW.</li> </ul>
	<b>Summary</b>	<ul style="list-style-type: none"> <li><b>Implement WC/WDM measures to reduce the percentage of non revenue water.</b></li> <li><b>Increase the volume purchased from the CoCT</b></li> </ul>

**Water Quality:** Some of the water quality aspects that require attention, as identified in the recently updated Water Safety Plan, and which SM is currently busy to address are summarised in the table below:

Existing Water Quality Risks	Recommendation	Timeframe
Eutrophication in the Idas Valley storage dams as a result of nutrient inflow into the dams from upstream wineries and other activities.	Draw up a Master Plan for new treatment processes at the Idas Valley WTW. This is already done by Worley Parsons. Intensive monitoring of water quality in the storage dams. Investigate discharge of effluent streams into the storage dams and draw up control measures to prevent undesirable	It is the intention of the Municipality to position themselves so that they are ready when specifications for NOM will be included in SANS241 over the next two years.
No standby dosing pumps in place at Franschoek WTW, leading to dosing failure.	Provide a standby dosing pump	In Process
Final water contamination due to inadequate design at Paradyskloof WTW (Filter drain water ends up in treated product water)	Perform modifications (Concrete work and pipes) to allow discharge to waste of the filter drain water.	In Process (Worley Parsons)
Final water contamination due to drainage of slow sand filters at Idas Valley WTW	Perform modifications (Concrete work and pipes) to allow discharge to waste of the filter drain water. Plans to improve the slow sand filtration efficiency are in hand for Idas Valley, which includes facilities for washing the sand.	Will receive attention during 2011/2012
No in-line monitoring taking place (e.g. pH and Turbidity), leading to these values occasionally out of range.	Provide in-line pH and Turbidity meters at the Paradyskloof and Idas Valley WTWs and portable meters at the Franschoek WTW.	Before December 2011. Maxal is already investigating the installation of in-line chlorine monitoring equipment at the various stations.

Regular sampling and reporting is part of SM's operating procedures and the Municipality is committed to ensure that the results are given through to the DWA. SM realises the importance of good communication with its inhabitants in the various towns to ensure consumer trust and confidence. Total transparency is therefore one of the main objectives when public notifications are distributed. High on the list of priorities in these communications is regular communication on water quality and in particular how efficient the water treatment plants performs and whether the required standards are met.

SM implements a comprehensive Operational and Compliance Monitoring water quality sampling program, which meets the minimum requirement of DWA as stipulated in the Blue Drop certification criteria. Operational sampling is done on a frequent basis by the treatment plant personnel at the various WTWs. Compliance sampling, at various points throughout the distribution networks, is also done on a monthly basis by Emanti and analysed at accredited laboratories.

SM also do operational and compliance monitoring of the effluent at all their WWTWs according to a comprehensive operational and compliance monitoring effluent sampling program, which meets the minimum requirement of DWA as stipulated in the Green Drop certification criteria. Operational sampling is done on a frequent basis by the treatment plant personnel at the various WWTWs, and analysed at the Stellenbosch Laboratory at the Stellenbosch WWTW. Compliance sampling is done by WSSA and analysed at an external accredited laboratory.

SM can encourage the large users to implement suggested re-use practices by means of incentives, informative billing to communicate monthly water consumption and monitoring and communicating actual savings achieved.

SM is committed to ensure that all persons apply for the discharge of industrial effluent into the sewerage system and to continue with the monitoring of the quality and quantity of industrial effluent discharged into the sewerage system in order to determine whether the quality complies with the standards and criteria as set out under Section 9.7 of Module 2 and to exercise their legislative authority through their set of by-laws.

Water demand and resource management should be discussed with industries with the specific purpose of limiting wasteful water use and possible re-use of processed water or the use of purified wastewater.

Only the larger industries are currently monitored for quality and volume of effluent discharged. The current approach adopted by SM in which the various parameters at all industrial consumers are monitored should be continued, as well as volumetric monitoring at the larger users. Adaptation of the current procedures must be undertaken in accordance with any changes to the wastewater discharge criteria set by DWA. It will also be necessary to consider limits above which volumetric monitoring will be necessary at new industries and existing smaller industries, where expansion is likely to take place.

It is recommended that all industries with discharge permits to supply and maintain a flow meter measuring the volume of water that is discharged from their premises to the treatment works. It is also recommended that the accounts generated by the Municipality include for each cycle a summary of the COD and flow results to enable industries to keep a record and look at ways of improving where possible.

## FINANCIAL

### Status Quo:

**Capital Budget:** SM's Water and Sanitation Capital Budget for 2011/2012 is R18.6M and R52.3M respectively. The Water and Sewer Master Plans for the various towns in SM's Management Area recommends upgrades to the value of R179.529M and R74.372M (R-yr2007 value including P&Gs, Contingencies, Fees and excluding VAT) in the foreseeable future in order to accommodate development and population growth according to the SDF.

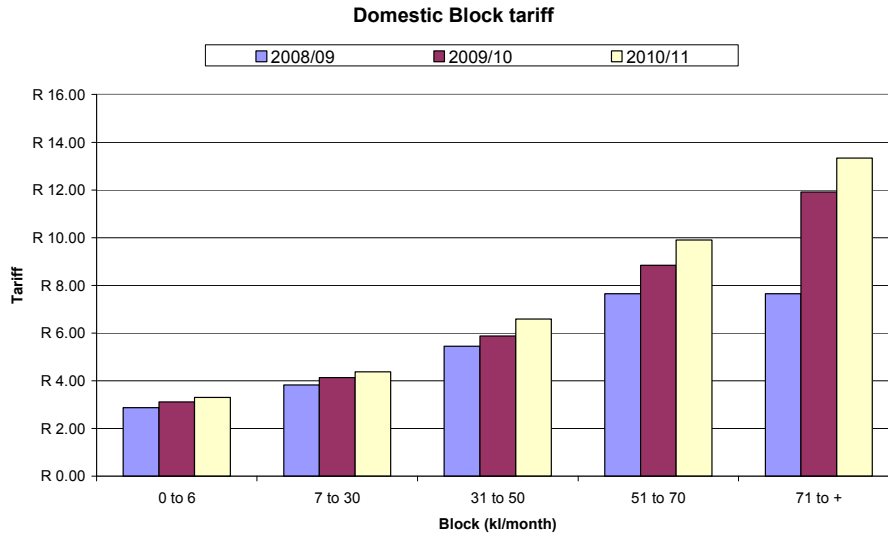
**Operational Budget:** The table below gives a summary of the total operating costs and income for water and sanitation services for the various years.

Description	Current Budget	Record Prior (R)				
	10/11	09/10	08/09	07/08	06/07	05/06
Total operating expenditure for Water	R68 818 000	R98 715 000	R44 299 000	R45 855 000	R48 811 000	
Total operating income for Water	R67 552 000	R76 751 000	R64 125 000	R45 517 000	R49 032 000	
<b>Nett Surplus / Deficit</b>	(R1 266 000)	(R21 964 000)	R19 826 000	(R338 000)	R221 000	
Total operating expenditure for Sanitation	R48 857 000	R59 178 000	R28 421 000	R25 026 000	R28 330 000	
Total operating income for Sanitation	R48 650 000	R54 165 000	R41 872 000	R39 086 000	R27 454 000	
<b>Nett Surplus / Deficit</b>	(R207 000)	(R5 013 000)	R13 451 000	R14 060 000	(R876 000)	

**Tariff and Charges:** SM provides the first six (6) kilolitres of water free to all registered indigent consumers. SM's tariffs support the viability and sustainability of water supply services to the poor through cross-subsidies (where feasible). Free basic water and sanitation services are linked to SM's Indigent Policy and all indigent households therefore receive free basic water and sanitation services.

This implies that either the equitable share is used to cover this cost, or higher consumption blocks are charged at a rate greater than the cost in order to generate a surplus to cross-subsidies consumers who use up to six (6) kilolitres per month.

SM's block tariff structure for the various financial years is presented on the graph below:



Gaps and Strategies:

**Capital Budget:** 44.7% Of the bulk water pipelines (27.7km) and 48.0% of the water reticulation network (175.5 km) is in a poor or very poor condition. 62.9% Of the bulk sewer pipelines (12.4 km) and 50.9% of the sewer reticulation network (143.5 km) is in a poor or very poor condition. It is therefore important for SM to commit to a substantial and sustained programme of capital renewal works.

The replacement value of the water and sanitation infrastructure that is expected to come to the end of its useful life over the next 20 years is around R684.9 (an average of R34.2M per year). The renewals burden is set to increase sharply over the next 20 years. Water and sanitation infrastructure assets with a total current replacement value of about R346.4M will be reaching the end of their useful lives over the first 10 years and will need to be replaced, rehabilitated, or reconstructed. In the following 10 year period, the amount is estimated to be R338.5M.

In view of these needs, the current level of expenditure on capital renewal is clearly inadequate, and there is a critical need for council to commit to increase the budget for the maintenance and rehabilitation of the existing infrastructure substantially. The extent to which each type of water and sanitation asset portfolio has been consumed were previously summarised – the low percentage figures for the bulk sewer pipelines, sewer reticulation and the WTWs and WWTWs points to the need for a dedicated renewals program targeting these assets. If this is not done, there is the risk that the ongoing deterioration will escalate to uncontrollable proportions, with considerable impact on customers, the economy of the area, and the image of SM.

SM's implementation strategies with regard to capital funds are as follows:

- To focus strongly on revenue collection, because most of the funds for water and sanitation capital projects are from SM's own funding sources. Actively implement the Customer Care, Credit Control and Debt Collection By-Laws in order to minimize the percentage of non-payment of municipal services.
- To identify all possible sources of external funding over the next three years to assist SM to address the huge capital infrastructure backlogs that exist in the various towns as included Annexure A.
- Develop IAMPs for all water and sanitation infrastructure, which will indicate the real replacement values, the service life of the assets and the funds required to provide for adequate asset replacement.



**Operational Budget:** Maintenance activities have been increasingly focused on reactive maintenance as a result of the progressive deterioration and failure of old infrastructure. Consequently, there has been dilution of preventative maintenance of other infrastructure.

An IAMP is necessary that optimises maintenance activities, appropriate to its specific needs and the local environment, and identifies the systems and resources required to support this. A regime of planned preventative maintenance should be established for all infrastructure assets classified as critical and important in the Asset Register. Consideration should be given to the establishment of a maintenance management system to enable SM to better manage its risks, and more effectively plan and prioritise the wave of renewals that are going to be required over the next 20 years.

It is important to note that the maintenance budget requirements are going to increase over the next twenty years in real terms, in line with the envisaged pace of development and the upgrading of the bulk infrastructure. It is estimated that the budget requirements will double over this period.

SM's implementation strategies with regard to operational budgets are as follows:

- Develop an IAMP, which will indicate the real replacement values and service lives of the assets and the funds required to provide for adequate operation and maintenance of the infrastructure.
- The new depreciation charges will have to form part of the operating budget and subsequent tariffs, inked to a ring-fenced asset replacement fund.
- Water services operational surpluses have to be allocated to essential water services requirements.

Current gaps include unrealistically low depreciation charges, which have to be rectified and ring-fenced into an asset replacement fund, as well as additional budget requirements above inflation for infrastructure development.

**Tariff and Charges:** The first six (6) kl of water is provided free to all indigent residential consumers. SM's current five (5) block step tariff system discourages the wasteful or inefficient use of water. It is expected that this tariff structure will continue to be implemented in the future.

The sustainable supply of potable water is becoming an ever increasing challenge. This scarce commodity has to be optimally managed. The increase in the price of electricity and chemicals for purification has contributed to the cost of delivering the service. The water usage block tariff has been structured for a basic affordable tariff for up to 30 kl per household per month. Punitive tariffs are introduced for excessive water consumption and to equalize the under recovery in the lower block. When the culture of water consumption conservation filters through from consumers, the lower end of the block tariff will have to be reviewed to balance the recovery cost of water supply.

The table below gives some comments on the specific blocks, with regard to SM's 2010/2011 block step tariff structure for water services.

Block (kl/month)	10/11 Standard	10/11 Restriction	Comments
0 - 6	R3-30	R3-30	Free Basic Water
7 - 15	R4-38	R4-82	Low volume use
16 - 30			Typical use volume, including garden irrigation
31 - 50	R6-59	R7-57	Above average use, including garden irrigation
51 - 60	R9-90	R11-39	
61 - 70			
71 - 100	R13-34	R15-34	Significant waste and/or unnecessary garden irrigation
> 100			

Wasteful or inefficient use of water is discouraged through increased tariffs. It is suggested that the following tariff structure characteristics should remain in SM's Structure in order to ensure efficient water use (WDM Strategy, Winelands District Municipality November 2007):

- Maintain a rising block tariff structure.
- Keep number of blocks in the tariff to a minimum. One block to address free basic water (the first step) and another to address the "cut-off" volume where consumers are discouraged to use water above this monthly volume (highest block) are required. In addition another three blocks could be used to distinguish between low users, typical use of high water use.
- The volumetric steps should be kept the same for all the areas within SM's Management Area.
- The cost of water in the maximum step should severely discourage use in this category. The volumetric use for the highest category could be 60 kl/month, above which residential water use could be considered to be wasteful or unnecessary. Garden use requiring in excess of this volume should be reduced in accordance with xeriscape practices.

SM's existing tariff system can be adjusted to an even more conservation oriented and holistically designed system to include also the following:

- Uniquely describe Municipal use with a distinction between use types (e.g. parks, sports, fire fighting, etc.)
- Use codes to uniquely describe at least single residential use, water use by schools, business, commercial and industrial use.

## WATER SERVICES INSTITUTIONAL ARRANGEMENTS

### Status Quo:

SM entered into Service Delivery Agreements with the CoCT to provide bulk potable water to some of the towns in SM's Management Area through their bulk distribution network. Bulk raw water is also provided from Theewaterskloof through the WCWSS to the Paradyskloof WTWs. Monitoring Committees still needs to be put in place with specific powers and functions around the provision of bulk water services. Discussions are currently taking place between the CoCT and SM with regard hereto. The obligations of the Bulk Water Services Providers are to deliver the services to particular standards of supply and service and to report on the extent of its compliance with those standards.

A comprehensive set of Water Services By-laws still needs to be compiled for SM's Management Area. The current Water Services By-laws that are in place are still the old by-laws per town. DWA's model Water Services By-laws are being used for the interim, until a new comprehensive set of Water Services By-laws is compiled.

SM got a comprehensive Performance Management System in place. The SDBIP is the process plan and performance indicator / evaluation for the execution of the budget. The SDBIP is being used as a management, implementation and monitoring tool that assists and guide the Executive Mayor, Councillors, Municipal Manager, Senior Managers and the community. The plan serves as an input to the performance agreements of the Municipal Manager and Directors. It also forms the basis for the monthly, quarterly, mid-year and the annual assessment report and performance assessments of the Municipal Manager and Directors.

At a technical, operations and management level, municipal staff is continuously exposed to training opportunities, skills development and capacity building in an effort to create a more efficient overall service to the users.

Submissions were also made to the DWA for the classification and registration of all the WTWs and WWTWs and the Process Controllers and Supervisors responsible for the management of these plants. A skill audit is

conducted during each year which leads to various training programmes in order to wipe out skills shortages and to provide employees with the necessary capacity. A Workplace Skills Plan for 2011/2012 is in place.

Gaps and Strategies:

A comprehensive set of By-laws with regard to water supply, sanitation services and industrial effluent is not yet in place (*S4(2)(b) and 21 of the Water Services Act*) for SM. SM also needs to ensure that the necessary mechanisms are put in place to effectively monitor the compliance of consumers with regard to the Water Supply, Sanitation Services and Industrial Effluent By-laws, once a comprehensive set of Water Services By-laws is in place.

SM is committed to develop a new WSDP every five years and to update the WSDP as necessary and appropriate in the interim years. The Municipality will also report annually and in a public way on progress in implementing the plan (Water Services Audit).

SM needs to focus strongly on the rehabilitation and the maintenance of the existing infrastructure, augmentation of their existing water sources and all planning for new services should be guided by the Water and Sewer Master Plans. Water and sanitation services are currently effectively managed by SM.

The CoCT is currently busy with the updating of their Service Delivery Agreements with SM for the provision of bulk water to the various towns in SM's Management Area. The current Agreements that are in place with the CoCT are outdated and needs to be updated urgently.

SM will also continue with their mentoring role for operators ensuring and adequately trained and classified workforce with dedicated training programmes for supervisors and operators. Budgets need to be established to address the shortfall of skilled staff, rethink methods to retain qualified personnel and plan for succession and clear career paths for experienced staff. With such a program a source of specific resources of skilled operators, technicians and managers will be established.

## SOCIAL AND CUSTOMER SERVICE REQUIREMENTS

Status Quo:

A comprehensive Customer Services and Complaints system is in place at SM and all complaints are logged and addressed by each Directorate separately. The Municipality has maintained a high and a very consistent level of service to its urban water consumers. The Municipality also developed help-desks at all municipal administrations with the objective to assist customers. Disabled people are supported to do business from the help-desks. Requests by the illiterate are being captured and forwarded to the relevant official / section.

After hour emergency requests are being dealt with by the emergency control room on a twenty four hour basis. Requests are furthermore captured on an electronic mail or works-order system to ensure execution thereof.

Gaps and Strategies:

*Water quality and continuity of supply:* All households in the urban areas receive water of an adequate drinking quality. It is estimated that approximately 11.5% (Outside > 200m) of the households on the farms receive water services below RDP standard. The figure is based on the detailed rural service level survey that was completed by the Cape Winelands District Municipality during 2007/2008 ("Ensuring provision of water services to residents living on privately owned land").

*Hygiene education and the wise use of water are taught in all schools by 2005:* Not yet in place

*Households with access to at least a basic sanitation facility know how to practise safe sanitation:* The entire population is targeted to some extent through initiatives such as water week and sanitation week, as well as information made available at schools, in public places and via the monthly accounts.

Sanitation promotion and health and hygiene awareness in SM's Management Area are mostly managed by the Cape Winelands District Municipality. SM is however committed to ensure that health and hygiene

awareness is part of the process of providing basic services on the farms, for those households with current sanitation facilities below RDP standard. This will be done with the necessary support from the Cape Winelands District Municipality.

Education and water audits at schools are one of the components of SM's proposed WDM Strategy and also forms part of the Socio-Political Programme component of the WDM Strategy. The Municipality will also focus on health and hygiene education on the farms, over the next few years, when basic sanitation facilities will be provided to those households with current sanitation services below RDP standard.

The present system operated by SM for complaints and public queries does not have performance and response time information feed back in place. This shortcoming needs to be addressed in order to measure future performance in the water and sanitations service.

SM is committed to maintain the existing high levels of attending to complaints for water and sanitation services in their urban areas and to respond within 24 hours to all queries and to repair all leaks and sewer blockages within 48 hours after being reported.

SM's implementation strategies with regard to customer services are to maintain the high level of customer service satisfaction and to keep record of all the necessary customer services information and to link the customer services KPIs to their Performance Management System, in order to ensure that the following goals are met:

- To monitor the number of consumers experiencing greater than 7 day interruptions in water supply per year and also the number of consumers receiving a flow-rate of less than 10 litres per minute.
- To ensure that private landowners provide at least basic services to those households with current service levels below RDP standard.
- To keep record of the number of water queries received and to monitor the number of complaints with regard to water quality and the number of major or visible leaks. To respond within 24 hours to all queries and to repair all leaks within 48 hours after being reported.
- To keep record of the number of sanitation queries / complaints received per year, the number of blockages, number of calls received for pit/tank emptying and the number of calls received for emergency maintenance to pits/tanks. To respond within 24 hours to all sanitation complaints and to repair all sanitation blockages on the networks within 48 hours. To respond within 48 hours to all requests for pit / tank emptying.
- To evaluate the health and hygiene awareness and water education programmes and to incorporate these programmes in their future planning. To ensure that health and hygiene awareness is part of the process of providing VIPs on the farms, for those households with current sanitation facilities below RDP standard. To focus on public awareness and school education programmes through the implementation of the WDM Strategy.
- To have a Formal Pollution Contingency Plan for the Management Area and to ensure that pollution awareness is part of the Plan.
- To compile and implement a Water Services Consumer Charter.

## NEEDS DEVELOPMENT PLAN

### Status Quo:

The identification of projects necessary to ensure the provision of adequate levels of water and sanitation services is based primarily on the findings of the Water and Sewer Master Plans, in consultation with the Municipality's town planning consultants. Master Planning is typically based on a forward planning horizon of 20 years, but is usually updated every three to five years, taking into account improved water demand estimates and subsequent infrastructure developments which may have taken place. Water and Sewer

Master Plans were drafted for SM by Element Consulting Engineers during February 2008. The recommended projects from these Master Plans were incorporated into the WSDP.

The Master Plans represent the ideal infrastructure development required to meet projected water demands over the next few years, while realistic capital investment in infrastructure projects is determined by budget availability. As a result, prioritization of projects is necessary to identify what can be done within the available and projected budget constraints. The prioritization of projects is done through the IDP and annual budget planning process. Recommended infrastructure projects for implementation in the future will be based on the following plans and processes:

- Water and Sewer Master Plans and Water and Waste Water Treatment Works Master Plans.
- Infrastructure replacement needs (Asset Register)
- Budget proposals
- Asset Management Plans
- Projects recorded in the table below refer to new infrastructure to be built or upgrading of existing infrastructure, as included in the approved capital budget of SM for 2011/2012.

Project name	Local Area	Water / Sanitation	Project type (e.g. bulk, reticulation, etc.)	Schedule Date, Estimated Cost		
				11/12	12/13	13/14
Reservoirs and dam safety	Stellenbosch	Water	Bulk Storage	R450 000	R600 000	R0
Bulk service upgrading	Franschhoek	Water	Bulk Storage & Supply	R1 000 000	R1 500 000	R0
Bulk water supply improvements	Management Area	Water	Bulk	R1 000 000	R1 000 000	R0
Idas Valley filtration plant: New filter beds	Stellenbosch	Water	Treatment	R0	R900 000	R0
Upgrade bulk water meters	Management Area	Water	Reticulation	R500 000	R500 000	R0
Reservoir	Management Area	Water	Bulk Storage	R8 000 000	R0	R0
Waterpipe replacement	Management Area	Water	Reticulation	R2 000 000	R2 000 000	R0
Telemetry	Management Area	Water	Other	R200 000	R300 000	R0
Bulk Water Infrastructure – Planning and Development	Management Area	Water	Bulk Storage & Supply	R4 000 000	R4 000 000	R0
Water Master Plan Implementation	Management Area	Water	Reticulation	R1 000 000	R1 000 000	R0
Small Capital: FTE Water Filtration Paradyskloof	Stellenbosch	Water	Treatment	R50 000	R50 000	R0
Basic water programme: Water sources	Management Area	Water	Bulk	R0	R150 000	R0
Bulk Watermain: Idasvalley to Cloetesville	Stellenbosch	Water	Bulk Pipeline	R400 000	R16 000 000	R0
Design and construction of new reservoir	Klapmuts	Water	Bulk Storage	R0	R400 000	R2 000 000
WSDP Upgrade & Implementation	Management Area	Water	Other	R0	R0	R400 000
<b>Total Water</b>				<b>R18 600 000</b>	<b>R28 400 000</b>	<b>R2 400 000</b>
Upgrade WWTW	Franschhoek	Sanitation	Treatment	R1 800 000	R0	R0
Refurbishment of WWTW	Stellenbosch	Sanitation	Treatment	R18 000 000	R38 000 000	R15 000 000
Sewerpipe upgrade and replacement	Management Area	Sanitation	Reticulation	R1 500 000	R1 500 000	R1 500 000
Upgrading of 375mm mainline sewerage	Management Area	Sanitation	Bulk Pipeline	R600 000	R800 000	R0
Sewerage Master Plans Implementation	Management Area	Sanitation	Reticulation	R1 000 000	R1 000 000	R1 000 000
WSDP Upgrade & Implementation	Management Area	Sanitation	Other	R0	R300 000	R0

Project name	Local Area	Water / Sanitation	Project type (e.g. bulk, reticulation, etc.)	Schedule Date, Estimated Cost		
				11/12	12/13	13/14
Upgrade WWTW	Wemmershoek	Sanitation	Treatment	R27 178 979	R25 480 000	R30 576 000
Upgrade pump stations	Management Area	Sanitation	Pump Stations	R0	R750 000	R0
La Motte Decommission	La Motte	Sanitation	Treatment	R0	R500 000	R0
Civil Works	Management Area	Sanitation	Other	R1 678 293	R0	R0
Upgrade WWTW	Klapmuts	Sanitation	Treatment	R0	R0	R1 000 000
Decommission WWTW	Franschhoek	Sanitation	Treatment	R0	R0	R250 000
Upgrade WWTW Design & Supervision	Kylemore	Sanitation	Treatment	R0	R0	R200 000
Specialized vehicles: Sewerage Network	Management Area	Sanitation	Other	R500 000	R0	R0
Small Capital: FTE Sewerage & Purification	Management Area	Sanitation	Other	R50 000	R0	R0
<b>Total Sanitation</b>				<b>R52 307 272</b>	<b>R68 330 000</b>	<b>R49 526 000</b>

Gaps and Strategies:

SM's key capital infrastructure projects for the next three years are as follows:

- Upgrading / Replacement of the existing water and sewer networks, rising mains and pump stations as identified through the Water and Sewer Master Plans.
- Additional reservoir storage capacity.
- Augmentation of the water sources and bulk water supply.
- Upgrading of the Paradyskloof and Idas Valley WTWs.
- Upgrading of the Stellenbosch and Wemmershoek WWTWs and the decommissioning of the La Motte and Franschhoek WWTWs.
- Rehabilitation and maintenance of the existing water and sanitation infrastructure.

SM's implementation strategies, with regard to new water and sanitation infrastructure, are as follows:

- Take the recommended projects, as identified through the Water and Sewer Master Plans and the WSDP, into account during the planning and prioritization process for new infrastructure. Prioritize from the desired list, those items which can be implemented from available funding in the particular financial year.
- To update the existing Water Master Plans and to undertake revised master planning at least every three to five years and to use the Master Plans to list the desired infrastructure development requirements and reflect these in the IDP.
- Assign a high priority to the provision of basic water and sanitation services in the rural areas.
- Assign a high priority to the implementation of SM's WDM Strategy (Demand Management), which is currently being developed, in order to postpone additional capital investment for as long as possible, both from the water availability perspective as well as from the treatment of increased effluent volumes.
- Balance land-use and development planning (SDFs and Growth Management Strategy) in accordance with the availability of water and the capacity of WTWs and WWTWs that are in place or that will be implemented.