LANGEBERG MUNICIPALITY

EXECUTIVE SUMMARY

WATER SERVICES DEVELOPMENT PLAN FOR

2014/2015

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ABBREVIATIONS AND DEFINITIONS

AADD	Average Annual Daily Demand
AMP	Asset Management Plan
BDS	Blue Drop System
C	Completed
CBR	Cogmanskloof Irrigation Scheme
COD	Chemical Oxygen Demand
CRC	Current Replacement Cost
CRR	Cumulative Risk Rating
dia	diameter
DRC	Depreciated Replacement Cost
DWA	Department of Water Affairs
DWQ	Drinking Water Quality
E.Coli	Escherichia coli
EC	Electrical Conductivity
ECD	Early Childhood Development
EHP	Environmental Health Practitioners
EIA	Environmental Impact Assessment
GAMAP	General Accepted Municipal Accounting Practices
GIS	Geographic Information Systems
HIV/AIDS	Human Immunodeficiency Virus infection/ Acquired Immunodeficiency Syndrome
IAMP	Infrastructure Asset Management Plan
IDP	Integrated Development Plan
ILI	Infrastructure Leakage Index
Kl/a	Kilolitre per annum
KPI	Key Performance Indicator
l/p/d	litre per day
l/s	Litres per second
LED	Local Economic Development
m	meter
m³/a	Cubic metre per year
MAP	Mean Annual Precipitation
Ml	Mega litre
Ml/d	Mega litre per day
O&M	Operation and Maintenance
P&G	Preliminary and General
PAT	Progress Assessment Tool
PDD	Peak Daily Demand
pH	power of Hydrogen
PRV	Pressure Reducing Valve
PS	Pump Station
RDP	Reconstruction and Development Programme

ABBREVIATIONS AND DEFINITIONS / Continue

RPMS	Regulatory Performance Management System
RUL	Remaining Useful Life
SANS	South African National Standards
SDBIP	Service Delivery Budget Implementation Plan
SDF	Spatial Development Framework
SFWS	Strategic Framework for Water Services
SMME	Small Medium Micro Enterprise
SOP	Standard Operating Procedures
SS	Suspended Solids
TMG	Table Mountain Group
UC	Un-completed
W_2RAP	Wastewater Risk Abatement Plan
WARMS	Water Authorisation and Registration Management System
WC/WDM	Water Conservation / Water Demand Management
WCNCB	Western Cape Nature Conservation Board
WDM	Water Demand Management
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSP	Water Services Provider
WTW	Water Treatment Works
WUA	Water User Association
WWTW	Waste Water Treatment Works

KEY TERMS

TERM	INTERPRETATION
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.
Climate Change	Changes in climatic conditions due to natural causes or to anthropogenic (man-made) effects such as emissions of greenhouse gases, e.g. carbon dioxide, nitrous oxide, and methane, from industry, transport, farming and deforestation, that are expected to have significant consequences for rainfall and water availability on earth.
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.
Global Warming	The increase in the average surface temperatures across the globe, usually measured over long periods of time; reported to have increased by 1^{o}C over the past hundred years.
IDP	A municipal plan as defined in the Municipal Systems Act.
National Water Resource Strategy 2	Sets out how we will achieve the following core objectives: • Water supports development and the elimination of poverty and inequality. • Water contributes to the economy and job creation, and • Water is protected, used, developed, conserved, managed and controlled sustainably and equitably.

KEY TERMS

TERM	INTERPRETATION
Re-use	Utilisation of treated or untreated wastewater for a process other than the one that generated it, i.e. it involves a change of user. For instance, the re-use of municipal wastewater for agricultural irrigation. Water re-use can be direct or indirect, intentional or unintentional, planned or unplanned, local, regional or national in terms of location, scale and significance. Water re-use may involve various kinds of treatment (or not) and the reclaimed water may be used for a variety of purposes.
RUL	The time remaining over which an asset is expected to be used.
Water Balance	The regulation or rationalisation of human activity to match the sustainable local water supply, rather than base, or a process of balancing water supply and demand to ensure that water use does not exceed supply.
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.
WSP	A Water services provider is • Any person who has a contract with a WSA or another WSP to sell water to, and/or accept wastewater for the purpose of treatment from that Authority or Provider, who is usually a bulk water services provider); or • Any person who has a contract with a WSA to take responsibility for providing retail water services to one or more consumers within a specific geographic area; or • A WSA that provides either or both of the above services itself.
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 or a programme 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 business elements included in the guidelines and addressed in detail in the three Modules of Langeberg Municipality'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 2014/2015 WSDP of Langeberg Municipality 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 (Water Services Audit Report).

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

1.1 Urban versus Rural Backlogs

There is no formal erven in the urban areas of Langeberg Municipality's Management Area without basic water and sanitation services. The total number of households in informal areas is currently estimated at 899 households. 559 Of these households are without basic communal water services and 564 households are without basic communal sanitation facilities. The 2011 Census data also indicated that there are still 250 households on the farms in the rural areas without basic water services and 952 households without basic sanitation services. Langeberg Municipality is however committed to work with the private landowners in order to ensure that basic services are provided to these households by the private landowners.

The Municipality's biggest challenges are the augmentation of the existing water sources, 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. Various bulk infrastructure capital projects were completed over the last number of years in order to ensure that the bulk water services infrastructure can meet the future demands for the various towns.

Adequate funds also need to be allocated to essential rehabilitation and maintenance of the existing infrastructure in addition to the need to extend services to poor communities as both are priorities which need to be addressed. Langeberg Municipality is committed to allocate adequate funds for the rehabilitation and maintenance of their existing infrastructure. Such maintenance is however in competition with the need to extend services to the poor communities. The Municipality realises that the lack of adequate maintenance of existing assets could result in the total collapse of such service, with enormous economic consequences.

1.2 Reliance on Water Resources Available and Bulk Infrastructure

The immediate augmentation of the Bonnievale, Montagu and Ashton water sources is however critical in order to meet future demands. The allocation for Bonnievale from the Zanddrift WUA canal is already exceeded, as well as the allocations and safe yields of the Montagu sources. The Municipality recently completed a brief (Desktop) source augmentation study for the various towns.

Detail Process Audits were carried out during 2013 for all the WTWs and WWTWs and some of the plants require upgrading and / or refurbishment in order to meet the future demands. The latest Water and Sewer Master Plans (March 2012) also indicated that some of the bulk water supply systems and sewer drainage networks need to be upgraded.

1.3 Links between Water Supply and Sanitation

The Water and Sewer Master Plans of Langeberg Municipality are linked to their SDF. The future development areas were identified as part of the SDF. Bulk water and sewer infrastructure and water and sanitation services are balanced with land usage and development planning. The Municipality is working towards ensuring that 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.

1.4 Limited Implementation and Operating Capacity in Some Municipalities

The Municipality has maintained a small percentage surplus funding over the last two years and has transferred it from accumulated surpluses to the Capital Replacement Reserve. With the structuring of rates and tariffs both the user-pay principle and full cost recovery are applied.

The municipal staff at a technical, operations and management level is continuously exposed to training opportunities, skills development and capacity building in an effort to create a more efficient overall service to the users. Langeberg Municipality will also continue with their mentoring role for operators, ensuring an 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.

1.5 Available funding

The estimated Capital Budget for Water and Sewerage Infrastructure are R23.6 million for 2014/2015, R15.0 million for 2015/2016 and R8.1 million for 2016/2017. Strong emphasis is placed on the sourcing of funds from either national or provincial sources for the funding of all new projects or programmes. The Municipality will not embark on new External Funding to fund large infrastructure projects. An Asset Management Plan needs to be developed from the available 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.

1.6 Affordability of Service Levels (Operation and Maintenance Costs)

Water and Sanitation Services are currently managed by Langeberg Municipality in a financially sustainable manner. The current water tariff structure however does not encourage consumers to save water. The sewer tariffs are also not yet linked to the water consumption. A surplus was generated from both the Water and Sewerage Services during the last three financial years. The Municipality is currently busy with a study to review their water tariff structure, in order to change it to a rising block tariff system. The new system will ensure that consumers become more aware of managing and reducing their own water consumption.

1.7 Growing Backlog in Refurbishment of Existing Infrastructure

An Infrastructure Asset Register is in place for all water and sewerage infrastructure. The depreciated replacement costs were calculated for the entire infrastructure, which indicated that 42.45% of the value of the water infrastructure has been consumed and 51.75% of the value of the sewerage infrastructure has been consumed.

It is essential for Langeberg Municipality 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 Langeberg Municipality 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.

1.8 Major Economic Development

Investing in infrastructure creates an enabling environment for economic growth and is an important precondition for sustainable growth. Although Langeberg Municipality 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 sewerage networks and rapid development, which is not always matched by growing capital expenditure, can further exacerbate the situation. Langeberg Municipality 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.

1.9 Associated Population Growth and Water Demand

Langeberg Municipality's average annual population growth rate over the period 2001 to 2011 was 1.86%. Detail future water demand projection models were compiled for each of the distribution systems, as part of the WSDP process. The Municipality also recently drafted a new WDM Strategy and the specific WDM activities will now be implemented, in order to reduce the current percentage of non-revenue water as far as possible and to keep the future water demands as low as possible. The augmentation of the existing water sources of Bonnievale, Ashton and Montagu is critical, in order to meet the future demands.

2. 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 2014/2015 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.

All 12 Wards in Langeberg Municipality's Management Area are functional and have monthly Ward Committee meetings. The Ward Committees are utilised in distribution, completion and collection of inputs from the communities on services that need to be rendered to them. Langeberg Municipality's Council further approved the Batho Pele Strategic Plan during November 2012 and a Customer Care Policy is also in place.

The Vision and Mission statements of Langeberg Municipality are as follows:

Table 2.1: Vision and Mission Statement of Langeberg Municipality
VISION STATEMENT
"To create a stable living environment and sustainable living conditions for all citizens"
MISSION STATEMENT
"By providing cost effective quality services to the Citizens, exercise good leadership, ensuring sound governance and financial management"

3. DEMOGRAPHICS

3.1 Status Quo

Langeberg Municipality falls within the Breede-Gourtiz Catchment Management Area and includes the towns Robertson, McGregor, Bonnievale, Ashton and Montagu and the farms in the rural areas.

The most significant challenges, from a Water Services perspective are the augmentation of the existing water sources, the replacement and upgrading of the old water and sewerage infrastructure to accommodate future development, the operation and maintenance of the WTWs and WWTWs in a sustainable manner, the provision of sustainable basic services to informal settlements and to ensure the provision of basic services to households located on private owned 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, with regard to the provision of basic services.

Physical Perspective:

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.

By protecting water resources, a system that is more resilient to the impact of climate change, such as floods and droughts will be ensured. In addition, a healthy functioning ecosystem can assist in mitigating some of the impacts of climate change on society. For example, well-functioning wetlands can minimise the impacts of floods and ensuring good riparian habitat can provide shading and minimise evaporation from the water resources. Groundwater aquifers can provide safe storage of water for use, if they are protected and not over-abstracted or polluted, for example, by untreated effluent.

It is therefore advisable for Langeberg Municipality 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:

- All resources, especially surface water resources, need to be re-evaluated, especially where demand is close to the safe one in twenty year yields. It is therefore important to 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.

Natural Environment:

The draft final SDF (March 2014) of Langeberg Municipality includes the following Natural Systems Synthesis for the area.

- Langeberg Municipality is endowed with a comprehensive system of critical biodiversity area corridors of which a large extent is already formally or informally conserved. Protection of the Langeberg corridor is already mostly continuous throughout the municipality;

- Efforts should be made to complete these conservation linkages by encouraging links between:

  - Anysberg Nature Reserve, Rooikrans and Drie Kuilen Private Nature Reserves and Matroosberg Mountain Catchment area (taking care to retain the dryland farming area between Drie Kuilen Private Nature Reserve and Matroosberg Mountain Catchment Area;

  - Extending the Langeberg Wes Mountain Catchment Area (Waboom mountains) eastwards; and

  - Creating formal or informal protected corridors across the Breede River Valley linking the Langeberg range to the Riviersonderend Mountains. These are likely to be the most challenging. Some of these links exist along the tributaries flowing from the Riviersonderend mountains into the Breede River but there are also important farming areas in these corridors and it will be difficult enough to secure a riparian buffer areas a minimum of 32 metre from the banks, never mind a wide biodiversity corridor;

- The river networks form another important natural system. These are largely in an acceptable state except for and the Touws, Keisie, Vink, Poesjenels, Houtbaais and the Riviersonderend where it flows through the municipality near Swellendam. Conservation and improvement of these river systems could be considered even more important for Langeberg municipality compared to other municipalities given the importance of agriculture in its local economy.

- Agri-industry and agriculture are Langeberg municipality's most important economic and employment sectors. Langeberg is fortunate in that its agricultural resources are mostly intensive, comprising vineyards, orchards and pastures. These are dependent on water, already mentioned, and arable land. Together with the magnificent scenery these resources and agricultural activities, especially wine-making form the basis of its vibrant tourism industry; and

- Therefore, it is important that the arable land resource comprising existing as well as potential farming areas is retained and improved and not converted to other uses, especially urban development. This should be encouraged to locate to non-arable land.

Demographic Perspective:

The growth potential of towns Study (November 2013) determined the growth potential and socio-economic needs of settlements in the Western Cape outside of the Cape Town metropolitan areas using quantitative data. The growth potential and socio-economic needs of the towns in Langeberg Municipality's Management Area were indicated as follows in the Study.

Table 3.1.1: Growth Potential and Socio-Economic Needs of the towns in Langeberg Municipality's Management Area (Growth Potential Study, November 2013)

Town / Settlement	Growth Potential	Socio-Economic Needs
Robertson	Medium	High
McGregor	Medium	Very Low
Bonnievale	Medium	Medium
Ashton	Medium	Medium
Montagu	Medium	Medium

The key human development issues facing the Municipality include poverty and unemployment. People migrating to the Langeberg have far reaching implications for the Municipality as it has a major effect on the economy. In-migration of people has an impact on the provision of housing and services, unemployment, poverty and the economy in general.

3.2 Gaps and Strategies

The Spatial Vision for Langeberg Municipality, as included in the draft final SDF (March 2014), is as follows:

"To ensure that the municipality's physical attributes including the Riviersonderend, Langeberg and Waboom mountains, Breede river with its tributaries and fertile land, the large heritage building stock, factories and infrastructure, including the R60 and R62, are sustainably exploited so as to continue to provide and enhance the livelihoods of its residents"

The implications of this vision are as follows:

- The water quality and quantity of the rivers must be improved, especially in the Touw, Keisies, Poesjenels, Houtbaais and Riviersonderend Rivers;
- There should be no further urban development of existing or potential arable land;
- The use of the rail system for freight traffic should be promoted so as to free up the use of the road network for commuter and tourist private motor vehicle, bus and coach and non motorised traffic.
- The visual impact of buildings, e.g. large resorts, factories and sheds, and infrastructure, power lines, renewable energy facilities and roads should be carefully assessed; and
- Highly accessible and visually exposed sites should also be accessible to SMME businesses.

The SDF includes the Core landscape areas, Urban Development, Heritage Areas and Urban Restructuring Framework for each of the five towns in Langeberg Municipality's Management Area. The following elements are also comprehensively discussed in the SDF and therefore not duplicated in the WSDP.

- Bio-regions;
- Spatial Planning Categories
- Sustaining the Economy
- Major Infrastructure Projects
- Major Tourism Destinations;
- Land Reform;
- Urban Related Development;
- Urban Design Guidelines;
- Potential Rural Nodes and Periodic Rural Markets; and
- Settlement Hierarchy.

4. SERVICE LEVELS

4.1 Status Quo

The table below give an overview of the number of consumers units for the various distribution systems in Langeberg Municipality's Management Area (Swift Records, Occupied records).

Table 4.1.1: Number of user connections in each user sector (Swift Records – Occupied records)

Category	Robertson	McGregor	Bonnievale	Ashton	Montagu	Total
Business / Commercial	176	23	63	31	139	432
Industrial	1	0	3	3	11	18
Cluster	0	0	0	1	0	1
Education	4	3	3	2	6	18
Farms	23	0	50	2	6	81
Flats	0	1	12	0	6	19
Government Institutions	39	10	31	23	29	132
Other	2	0	3	0	3	8
Parks	1	0	3	0	5	9
Informal	293	0	0	0	0	293
Residential	4 974	560	1 655	2 193	3 000	12 382
Large	96	0	19	17	20	152
Total	**5 609**	**597**	**1 842**	**2 272**	**3 225**	**13 545**

The current residential water and sanitation service levels in Langeberg Municipality's Management Area are estimated as follows:

Table 4.1.2: Residential water and sanitation service levels

Service Level	Robertson	Ashton	Montagu	Bonnievale	McGregor	Farms	Total
WATER SERVICE LEVELS							
Basic Need (RDP)	0	0	0	0	0	250	**250**
Housing Need (No Services) (1)	445	23	0	91	0	0	**559**
Housing Need (Communal Services) (2)	5	0	90	130	115	0	**340**
Adequate (3)	7 072	3 335	3 939	2 155	538	6 933	**23 972**
Total	**7 522**	**3 358**	**4 029**	**2 376**	**653**	**7 183**	**25 121**
SANITATION SERVICE LEVELS							
Basic Need (RDP)	0	0	0	0	0	952	**952**
Housing Need (No Services) (1)	450	23	0	91	0	0	**564**
Housing Need (Communal Services) (2)	0	0	90	130	115	0	**335**
Adequate (3)	7 072	3 335	3 939	2 155	538	6 231	**23 270**
Total	**7 522**	**3 358**	**4 029**	**2 376**	**653**	**7 183**	**25 121**

Notes: (1) Informal areas with no services
(2) Informal areas with existing communal services
(3) Adequate: Based on the 2011 Census data "Water Services inside Dwelling" and the estimated number of backyard dwellers on formal erven.

4.2 Gaps and Strategies

As a priority it is the responsibility of Langeberg Municipality 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.

Water and Sanitation Service Level Policies for Langeberg Municipality are not yet in place, but the service levels to be provided by the Municipality to the consumers in their Management Area are however addressed in the Municipality's Water Services By-laws. All water and sanitation services provided by Langeberg Municipality to consumers within the Municipal Management Area are linked to the Municipality's Tariff Policy and Rates Policy and poor households are incorporated through Langeberg Municipality's Indigent Policy.

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

All the formal households in the urban areas of Langeberg Municipality's Management Area are provided with water connections inside the property (Higher level of service). Communal standpipes and ablution facilities are provided in the informal areas as temporary emergency services. Langeberg Municipality 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 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.

Langeberg Municipality is committed to support the private landowners as far as possible with regard to addressing the basic water services backlog that might still exist on the farms in the rural areas. Langeberg Municipality 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 most appropriate 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 Langeberg Municipality.
- Subsidising the operating and maintenance costs. If the basic service is to be provided free to the poor then Langeberg Municipality must ensure that the costs of providing the service are covered by the local government equitable share and / or through cross-subsidies within Langeberg Municipality'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 Langeberg Municipality's Management Area have adequate and safe water supply and sanitation services. All the schools in Langeberg Municipality's Management Area also have adequate and safe water supply and sanitation services. It is important for the schools in Langeberg Municipality's Management Area to focus on Water Demand Management activities and for Langeberg Municipality to support the schools with a WDM programme.

5. SOCIO ECONOMIC BACKGROUND

5.1 Status Quo

The 2001 Census recorded the population in the Langeberg Municipality's Management Area at 81 275 (20 926 Households) and the 2011 Census data recorded the population at 97 724 (25 125 Households). The population of Langeberg Municipality is currently estimated at approximately 99 813 persons for 2012/2013.

Due to the high levels of uncertainty projecting the current and future population of Langeberg Municipality it was decided to include a **high** and **low** estimate in the WSDP. The high growth percentages were however used in the future water demand projection models for each of the water distribution systems. The estimated current population and the population growth rates for the various distribution systems are summarised in the table below.

Table 5.1.1: Estimated current population and population growth rates

Distribution System	Historical Population Growth per year (2001 – 2011)	Census 2011			Future Population Growth per year (2011 Onwards)	Projections for 2012/2013		Number of Residential Consumer Units for 2012/2013
		Popula-tion	Number of Households	Persons / Household		Popula-tion	Number of Households (Permanent)	
Robertson	2.52%	27 714	7 525	3.68	2.5%	28 407	7 719	5 267
					2.0%	28 268	7 682	
McGregor	2.80%	3 125	654	4.78	2.5%	3 203	670	561
					2.0%	3 188	667	
Bonnievale	3.04%	9 092	2 377	3.82	2.5%	9 319	2 440	1 667
					2.0%	9 274	2 428	
Ashton	1.35%	13 325	3 357	3.97	2.0%	13 592	3 424	2 193
					1.5%	13 525	3 407	
Montagu	3.99%	15 176	4 029	3.77	3.5%	15 707	4 166	3 006
					2.5%	15 555	4 126	
Farms	0.22%	29 292	7 183	4.08	1.0%	29 585	7 251	-
TOTALS	**1.86%**	**97 724**	**25 125**	**3.89**	**2.14%**	**99 813**	**25 670**	**12 694**
					1.71%	**99 395**	**25 561**	

The number of indigent households in Langeberg Municipality's Management Area was 6 635 in June 2013 and 6 621 in January 2014. The unemployment rate in Langeberg Municipality was 11.3% in 2011, which was the second lowest in the Cape Winelands District (Witzenberg Municipality at 7.6%). Household income peaks around the R19 201 – R38 400 per annum level with 6 244 households in Langeberg Municipality within this category in 2011.

A Human Settlement Plan is in place. The housing department reviews the housing demand list from time to time, to determine whether applications are still relevant and the waiting list is then updated accordingly. The housing projects that the municipality engages in has to keep up with demand determined by growth trends such as population, economy and the influx of people into the municipal area. The projects are subject to the availability of land and funds, made available by the relevant Provincial departments.

The main problem with identified land is that it is not serviced and therefore affects the development timelines. The municipality currently experiences a growth in informal settlements in certain areas. A migration plan is however not yet in place. The Municipality's housing pipeline include 2 547 sites and 2 580 housing units.

Langeberg Municipal economy was the second fastest growing economy in the Cape Winelands Region growing at 5.1% per annum over the period 2001 to 2011 (Stellenbosch Municipality at 5.5% per annum). The growth of the Transport, storage and communication sector was the highest at 15.5% per annum.

5.2 Gaps and Strategies

Social: The youth in Langeberg Municipality are susceptible to social ills such as HIV and AIDS, crime and drug abuse. Langeberg Municipality renders a youth development function through the Youth Advisory Centre which focuses on job preparedness, HIV/Aids awareness, information on student loans / bursaries, learnerships, job opportunities, career guidance, including on-line university applications and psychometric assessments. The challenges experienced include:

- Rendering the service to all the towns
- Addressing the expectations of the youth
- Obtaining funding to address these expectations;
- Unemployment amongst the youth;
- Social evils, such as substance abuse, teenage pregnancies, gangsterism, school drop outs, crime, etc.

The Municipality further also has a Rural Development Programme, which includes ECD, Vegetable Gardens, Holiday Programmes for Farm Children, Farm Worker of the Year Competition, Farm Libraries, Substance Abuse, Farms got Talent, Provincial Farm Worker Sports Day, Puppet shows, Life Skills Training, Mal-practices on farms, Labour Legislation training and Women's Day Programme. Some of the challenges include: Labour unrests, Lack of staff to render a sufficient service and the size of the municipal rural area.

Poverty is a major concern in the Western Cape Province and is very fragile to social and economic conditions. It has been revealed that poverty increased in all local authorities in the Cape Winelands District, with the highest increase being in Stellenbosch (5.7%), Langeberg (4%) and Witzenberg (3.8%).

Economic: Langeberg Municipality's LED Strategy aims to achieve its vision "***to foster long term economic growth and employment to develop the Langeberg Municipality as home to a thriving economy for the benefit of all residents"*** by meeting the following strategic objectives:

Table 5.2.1: LED Strategic Objectives

Strategic Objective	Programmes
To create an enabling environment for business growth	• Facilitate business investment and growth through an improved business climate. • Facilitate business growth through a local purchasing programme. • Facilitate the development of SMMEs and new entrepreneurs. • Attract investment to the Langeberg Municipality.
To facilitate the provision of key resources for LED	• Ensure the availability of hard infrastructure to facilitate business investment, retention and growth. • Facilitate the availability of required skills for business investment, retention and growth. • Facilitate improved transport in Langeberg Municipality for economic development.
To create an enabling institutional environment for LED	• Ensure sufficient human resource capacity within the municipality to fulfil the LED mandate. • Improve participation of all key LED stakeholders in LED research, planning, implementation and M&E.

Table 5.2.1: LED Strategic Objectives	
Strategic Objective	**Programmes**
To develop key sectors with competitive advantages and opportunities	• Drive the local economy through agriculture. • Develop the tourism sector within Langeberg Municipality to a bigger extent. • Investigate the diversification of the local economy to reduce seasonality of economic activities. • Assist informal economy businesses.

6. INFRASTRUCTURE

6.1 Status Quo

Langeberg Municipality is responsible for the operation and maintenance of all the water and sewerage infrastructure summarised in the table below:

Table 6.1.1: Summary of existing water and sewerage infrastructure	
Component	**Description of the main functional tasks**
Dams (7)	Bulk storage (Koos Kok, Dassieshoek, Gamgrove, Rooi Dam, Vaal Dam, Nuwe Dam, Ashton WTW Dam)
Bulk Pipelines (21.225km)	Bulk delivery (Robertson 0km, McGregor 0.630km, Bonnievale 1.145km, Ashton 1.970km and Montagu 17.480km)
Water Reticulation (273.766km)	Distribution (Robertson 92.570km, McGregor 12.530km, Bonnievale 48.815km, Ashton 59.031km and Montagu 60.820km)
Water Pump Stations (28)	Ensure adequate pressure and supply to certain areas (Robertson RW-2, TW-4, McGregor RW-2, TW-1, Bonnievale RW-1, TW-3, Ashton RW-3, TW-4 and Montagu TW-8)
Reservoirs (25)	Balancing peak demands and providing some emergency storage (Robertson 4, McGregor 3, Bonnievale 3, Ashton 4 and Montagu 11)
Water Treatment Works (5)	Treat Raw Water to required standard (Robertson 10.14 Ml/d, McGregor 0.6 Ml/d, Bonnievale 3.04 Ml/d, Ashton 11.91 Ml/d and Montagu 5.18 Ml/d)
Sewer Reticulation (247km)	Collecting sewerage (Gravity Pipes 230km and Rising Mains 17km)
Sewer Pump Stations (18)	Pumping sewerage to WWTWs (Robertson 4, McGregor 0, Bonnievale 7, Ashton 3 and Montagu 4)
Waste Water Treatment Works (5)	Activated Sludge Robertson 8.68 Ml/d, Bonnievale 1.84 Ml/d, Ashton 2.43 Ml/d and Montagu 1.8 Ml/d) and Oxidation dams McGregor 0.3 Ml/d.

Water Infrastructure: The CRC and DRC of the water infrastructure of Langeberg Municipality is summarised in the table below (June 2013):

Table 6.1.2: CRC and DRC of the water infrastructure				
Asset Type	**GIS ID**	**CRC**	**DRC**	**% DRC/CRC**
Dam	DAM	R4 243 499	R36 732	1%
Bulk Water Pipeline	BWP	R3 193 527	R592 550	19%
Water Pump Stations	WPS	R3 311 919	R2 199 091	66%
Reservoir	RES	R9 357 737	R8 556 625	91%
Water Channel	WCH	R203 783	R183 405	90%
Water Reticulation Pipeline	WRP	R14 123 119	R7 869 233	56%
Water Treatment Works (Robertson)	WTW-001	R1 206 205	R16 632	1%
Water Treatment Works (Ashton)	WTW-101	R4 263 680	R408 703	10%
Water Treatment Works (Montagu)	WTW-201	R4 349 898	R3 987 161	92%
Water Treatment Works (Bonnievale)	WTW-301	R3 837 052	R3 807 820	99%
Water Treatment Works (McGregor)	WTW-401	R83 165	R67 337	81%
Total		**R48 173 584**	**R27 725 289**	**57.55%**

The above table means that 42.45% of the value of the water infrastructure has been consumed.

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

Table 6.1.3: Overview of the RUL and 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**
RUL						
Dam	DAM	R0	R0	R721 103	R3 522 397	R0
Bulk Water Pipeline	BWP	R170 000	R0	R0	R0	R3 023 527
Water Pump Stations	WPS	R0	R182 000	R2 738 978	R189 573	R201 368
Reservoir	RES	R323 810	R0	R331 700	R0	R8 702 227
Water Channel	WCH	R0	R0	R0	R0	R203 783
Water Reticulation Pipeline	WRP	R3 335 096	R384 506	R47 132	R3 078 755	R7 277 629
Water Treatment Works (Robertson)	WTW-001	R1 000 188	R0	R5 560	R200 457	R0
Water Treatment Works (Ashton)	WTW-101	R3 751 218	R72 218	R275 244	R0	R165 000
Water Treatment Works (Montagu)	WTW-201	R0	R0	R420 401	R264 907	R3 664 590
Water Treatment Works (Bonnievale)	WTW-301	R0	R0	R728 817	R5 150	R3 103 086
Water Treatment Works (McGregor)	WTW-401	R0	R0	R83 165	R0	R0
Total		**R8 580 312**	**R638 724**	**R5 352 100**	**R7 261 239**	**R26 341 210**
Age Distribution by Facility Type						
Dam	DAM	R4 243 499	R0	R0	R0	R0
Bulk Water Pipeline	BWP	R3 193 527	R0	R0	R0	R0
Water Pump Stations	WPS	R2 363 411	R103 300	R845 209	R0	R0
Reservoir	RES	R9 357 737	R0	R0	R0	R0
Water Channel	WCH	R203 783	R0	R0	R0	R0
Water Reticulation Pipeline	WRP	R8 075 503	R0	R431 576	R0	R5 616 039
Water Treatment Works (Robertson)	WTW-001	R1 206 205	R0	R0	R0	R0
Water Treatment Works (Ashton)	WTW-101	R4 119 243	R0	R144 437	R0	R0
Water Treatment Works (Montagu)	WTW-201	R4 349 898	R0	R0	R0	R0
Water Treatment Works (Bonnievale)	WTW-301	R3 837 052	R0	R0	R0	R0
Water Treatment Works (McGregor)	WTW-401	R83 165	R0	R0	R0	R0
Total		**R41 033 023**	**R103 300**	**R1 421 222**	**R0**	**R5 616 039**

The asset renewal needs for the water infrastructure assets over the next 10 years is R0.922 million per year. The reinvestment required is R8.580 million in the first 5 years and R0.639 million in the second 5 year period.

Sewerage Infrastructure: The current and depreciated replacement cost of the sewerage infrastructure of Langeberg Municipality is summarised in the table below (June 2013):

Table 6.1.4: Current and depreciated replacement cost of the sewerage infrastructure				
Asset Type	**GIS ID**	**CRC**	**DRC**	**% DRC/CRC**
Bulk Sewer Pipeline	BSP	R4 895 712	R3 621 804	74%
Sewer Pump Station	SPS	R31 573 933	R12 246 309	39%
Sewer Reticulation Pipeline	SRP	R128 827 699	R63 634 596	49%
Sewage Treatment Works (Robertson)	STW-001	R36 247 101	R15 334 664	42%
Sewage Treatment Works	STW-002	R13 000 023	R0	0%
Sewage Treatment Works (Ashton)	STW-101	R33 219 307	R17 011 058	51%
Sewage Treatment Works (Montagu)	STW-201	R19 117 176	R7 495 098	39%
Sewage Treatment Works (Bonnievale)	STW-301	R22 110 498	R19 765 041	89%
Sewage Treatment Works (McGregor)	STW-401	R3 185 997	R2 474 649	78%
Sewage Treatment Works (McGregor Discharge Unit)	STW-402	R1 352 327	R30 460	2%
Totals		**R293 529 773**	**R141 613 680**	**48.25%**

The table on the previous page means that 51.75% of the value of the sewerage infrastructure has been consumed. The following table gives an overview of the RUL and the age distribution by facility type for the sewerage infrastructure:

Table 6.1.5: Overview of the RUL and the age distribution by facility type for the sewerage infrastructure						
Asset Type	**GIS ID**	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
RUL						
Bulk Sewer Pipeline	BSP	R644 008	R0	R133 034	R0	R4 118 670
Sewer Pump Station	SPS	R14 821 945	R6 385 072	R4 861 708	R2 248 512	R3 256 696
Sewer Reticulation Pipeline	SRP	R24 474 610	R0	R29 009	R34 413 472	R69 910 609
Sewage Treatment Works (Robertson)	STW-001	R1 802 229	R5 993 436	R22 696 408	R0	R5 755 027
Sewage Treatment Works	STW-002	R13 000 023	R0	R0	R0	R0
Sewage Treatment Works (Ashton)	STW-101	R750 184	R4 890 859	R1 814 390	R12 883 826	R12 880 048
Sewage Treatment Works (Montagu)	STW-201	R6 956 448	R111 151	R26 680	R6 525 380	R5 497 517
Sewage Treatment Works (Bonnievale)	STW-301	R0	R0	R7 776 567	R0	R14 333 931
Sewage Treatment Works (McGregor)	STW-401	R76 150	R1 333 274	R0	R0	R1 776 574
Sewage Treatment Works (McGregor Discharge Unit)	STW-402	R1 352 327	R0	R0	R0	R0
Totals		**R63 877 925**	**R18 713 792**	**R37 337 796**	**R56 071 189**	**R117 529 071**
Age Distribution by Facility Type						
Bulk Sewer Pipeline	BSP	R2 010 284	R0	R1 951 599	R156 788	R777 041
Sewer Pump Station	SPS	R5 869 528	R9 505 018	R6 977 857	R1 987 231	R7 234 299
Sewer Reticulation Pipeline	SRP	R13 907 746	R148 340	R35 183 455	R18 692 624	R60 895 534
Sewage Treatment Works (Robertson)	STW-001	R11 202 743	R128 308	R243 453	R0	R24 672 597
Sewage Treatment Works	STW-002	R13 000 023	R0	R0	R0	R0
Sewage Treatment Works (Ashton)	STW-101	R275 163	R6 096 832	R7 128 495	R1 143 665	R18 575 153
Sewage Treatment Works (Montagu)	STW-201	R0	R0	R7 188 158	R0	R11 929 018
Sewage Treatment Works (Bonnievale)	STW-301	R22 110 498	R0	R0	R0	R0
Sewage Treatment Works (McGregor)	STW-401	R3 109 847	R0	R0	R58 150	R18 000
Sewage Treatment Works (McGregor Discharge Unit)	STW-402	R0	R0	R0	R112 500	R1 239 827
Totals		**R71 485 833**	**R15 878 497**	**R58 673 016**	**R22 150 957**	**R125 341 470**

The asset renewal needs for the sewerage infrastructure assets over the next 10 years is R8.259 million per year. The reinvestment required is R63.878 million in the first 5 years and R18.714 million in the second 5 year period.

6.2 Gaps and Strategies

The Water and Sewer Master Plans (March 2012) for the various water distribution and sewer drainage systems in Langeberg Municipality's Management Area recommends upgrades of the water and sewer reticulation networks to the values indicated in the tables below in the foreseeable future in order to accommodate development and population growth according to the SDF.

Table 6.2.1: Summary of the future water and sewer infrastructure requirements for Langeberg Municipality, as included in the latest Water and Sewer Master Plans			
Zone / Area	**Water Infrastructure**	**Sewerage Infrastructure**	**Total**
Robertson	R33 674 400	R4 616 100	R38 290 500
McGregor	R3 237 400	R8 249 600	R11 487 000
Bonnievale	R24 028 000	R18 402 800	R42 430 800
Ashton	R30 944 600	R9 421 700	R40 366 300
Montagu	R28 606 400	R10 447 600	R39 054 000
Total	**R120 490 800**	**R51 137 800**	**R171 628 600**

Note: 2011 Values, which include P&Gs, Contingencies and Fees, but exclude EIA studies, registration of servitudes and / or land acquisition and VAT.

WATER TREATMENT WORKS

Table 6.2.2: Existing capacities and flows at each of the WTWs (Ml/d)				
WTW	**Existing Design Capacity**	**Peak Month Average Daily Flow**	**Average Daily Flow (July 2012 – June 2013)**	**Operational Capacity (i.t.o its Design Capacity)**
Robertson	10.140	8.681 (Jan)	6.155	60.7%
McGregor	0.600	1.150 (Jan)	0.755	125.8%
Bonnievale	3.040	5.717 (Jan)	4.384	144.2%
Ashton	11.910	12.494 (Febr)	5.985	50.3%
Montagu	5.180	5.487 (Jan)	3.853	74.4%

The section below gives an overview of the conclusions included in the detail WTW Technical Process Audits that were completed during 2013 for all the WTWs.

Robertson WTW: The plant is operating below capacity and no immediate extensions to the capacity are required. The works is generally in good condition with no refurbishment requirements identified. The water produced by the WTW generally complies with the required standards, except in the case of total coliforms and free chlorine which some samples analysed during the last calendar year exceeded the allowable limits. It is therefore proposed that the disinfection system is examined to ensure that it is working correctly.

McGregor WTW: The capacity of the WTW can be extended by the supply of additional filter units. There is however also some refurbishment work required in order to ensure maximum functionality of the existing infrastructure.

Bonnievale WTW: Some problems with colour and turbidity have occurred in the past. In terms of capacity the major bottleneck occurs at the filter units. Refurbishment of the buildings and pumps is also required.

Ashton WTW: The plant is currently operating below its design capacity and mostly complies with the standard limits. There is however significant refurbishment work that is required.

Montagu WTW: The plant currently has sufficient capacity to cater for water demands until approximately 2020. The works did however not perform that well in terms of treated water quality during the last calendar year. This problem should be investigated in order to determine the origin. No major refurbishment requirements were identified, but some general maintenance should be done on pumps and pipework to prevent degradation of equipment resulting from corrosion.

BULK WATER INFRASTRUCTURE

The Water Master Plan (March 2012) has indicated that based on the most likely land-use development scenario, it will be necessary to upgrade the following bulk water supply systems:

Robertson: The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. One of the two 250mm dia feeders from Reservoir 1 supplying to the central town area needs to be upgraded. The existing 75mm dia feeder main from the Reservoir 1 network to the Nkqubela booster PS needs to be upgraded.

McGregor: A new reservoir and a new booster pump station for the higher lying areas in McGregor were constructed and no further upgradings to the bulk water supply system are therefore required in the nearby future.

Bonnievale: The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A new 315mm dia dedicated rising main is necessary between the Old and New reservoirs. The existing 200mm dia rising main to the new reservoir can be utilized as an additional supply to the old reservoir when the existing supply to the old reservoir nears capacity.

Ashton: The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. One of the 200mm dia feeding mains from the WTW to the Langeberg Factory needs to be upgraded to a 315mm dia main.

Montagu: The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. The existing 200mm dia rising main from the WTW to the Ashbury Upper reservoir will needs to be upgraded. A new 160mm dia feeder main is required for the proposed Badshoogte reservoir.

WATER PUMP STATIONS

The Water Master Plan (March 2012) has indicated that based on the most likely land-use development scenario, it will be necessary for the following water pump stations:

Table 6.2.3: Future water pump stations required

Town	Recommendations included in the Water Master Plan	Capacity (l/s)	Head (m)	When	Cost
Robertson	Upgrade Reservoir 1 to town PS (Add 3rd pump set)	200	27	2012	R617 400
	Upgrade reservoir 2 – 3 pumps, when supply problems occur.	40	40	2014	R18 200
	Upgrade PS, when supply problems occur	100	45	2016	R499 800
	New reservoir 4 booster PS	4	26	2016	R553 000
McGregor	None	-	-	-	-
Bonnievale	PS at Old reservoirs site to supply water from Old reservoirs to the New reservoir	75	35	2014	R1 038 800
Ashton	Add 3rd pump set for standby at Langeberg PS. Required as emergency supply to Langeberg and Ashton Foods.	58	78	2013	R581 000
	Upgrade WTW to Cogmanskloof reservoir PS	135	72	2014	R889 000
	Downsize the Cogmanskloof to Conradiedorp PS	65	30	2018	-
	Upgrade Zolani pump station	45	80	2021	R347 200
Montagu	Add 2nd pump set for stand-by at WTW – South reservoir PS.	19	81	2014	R240 800
	Add 3rd pump set for stand-by at WTW – George Brink reservoir PS	22	51	2014	R190 400
	Upgrade WTW – Ashbury Upper reservoir PS	105	115	2018	R2 178 400
	New Ashbury PS	23	17	2015	R582 400
	Upgrade PS, when existing PS reaches capacity.	18	55	2028	R152 600
Total					**R7 889 000**

RESERVOIRS

Langeberg Municipality's overall storage factors of the reservoirs for the various towns, based on 1 x PDD (24 hours storage capacity), are 0.94 for Robertson, 1.58 for McGregor, 0.46 for Bonnievale, 0.61 for Ashton and 1.34 for Montagu. The overall storage factors for Bonnievale and Ashton are the lowest and additional reservoirs are needed for these towns. Even though the overall storage capacity might be adequate for the other towns there might be some distribution zones within those towns with inadequate storage capacity, which also require additional reservoirs. The future reservoirs required for the various towns, as identified through the Water Master Plan (March 2012), are indicated in the table below.

Table 6.2.4: Future reservoir storage capacities required

Town	Recommendations included in the Water Master Plan	Capacity (Ml)	When	Cost
Robertson	A new reservoir at the existing Reservoir 3 site, when additional storage capacity is required in the Reservoir 2 and 3 zones.	3.000	2014	R6 132 000
	A new reservoir at the existing Reservoir 4 site, when additional storage capacity is required in the Reservoir 4 zone.	2.000	2019	R4 676 000
	New reservoir to supply additional storage to the Reservoir 1 zone. Proposed on the hillside to the west of the existing town. This reservoir	5.000	2023	R8 820 000

Table 6.2.4: Future reservoir storage capacities required				
Town	**Recommendations included in the Water Master Plan**	**Capacity (Ml)**	**When**	**Cost**
	will act as a balancing reservoir which will feed the larger reservoir zone under peak demands.			
McGregor	None	-	-	-
Bonnievale	New reservoir at the existing Old reservoirs site.	5.500	2013	R9 472 400
	New reservoir at the existing New reservoir site when additional storage is required in the New reservoir zone when future development areas B06 – B09 are develop.	4.000	2014	R7 616 000
Ashton	New reservoir at the existing Cogmanskloof reservoir site to augment reservoir storage for Langeberg and Ashton Foods.	10.500	2014	R15 288 000
	New reservoir for Zolani at the existing Zolani reservoir site.	2.000	2016	R4 676 000
	New reservoir for Conradiedorp at the existing Conradiedorp reservoir site.	1.000	2018	R2 954 000
Montagu	New reservoir is proposed at the existing Badshoogte balancing tank site.	2.000	2015	R4 676 000
	New reservoir at the Ashbury Upper reservoir site for emergency storage purposes in the lower lying George Brink and Ashbury Lower zones.	3.500	2018	R6 910 400
Total				**R71 220 800**

WATER AND SEWER RETICULATION INFRASTRUCTURE

The Water Master Plan (March 2012) has indicated that based on the most likely land-use development scenario, the following future water reticulation infrastructure components will be necessary.

Table 6.2.5: Future water reticulation infrastructure required
Robertson
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 inter-connections and zone valves are required to re-zone the distribution system. Reinforcing pipelines are required to improve supply and ring network conveyance in the Reservoir 1 zone. A new main supply pipeline is required to the Nkqubela area. Proposed distribution zones: • The reservoir 2 and 3 zone boundaries are changed so that the new zones are enlarged. This is done to ensure that the storage capacity in the upper zones are optimised for the future demands and to improve pressures in the zones. • A future booster pump zone for the higher lying areas of the Reservoir 4 zone is proposed. • The rest of the zones remain the same apart from the fact that they are enlarged to accommodate future development areas.
McGregor
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 distribution network. Inter-connection pipes and zone valves are also required to re-zone the existing network to incorporate the new booster zone. Proposed distribution zones: • The McGregor reservoir zone is increased to include future development areas Mc01 – Mc05. • The zone boundaries of the McGregor reservoir zone are changed to include the new booster zone. A new booster zone is proposed for the existing higher lying erven of McGregor that currently experiences low static pressures.
Bonnievale
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 inter-connections are required to improve the network conveyance in Happy Valley. Reinforcing pipelines are required to improve network conveyance in the Old reservoir zone. A new main supply pipeline is required in the New reservoir zone to supply future development areas B03 & B06 – B09. Proposed distribution zones: • The zone boundaries in Happy Valley are changed slightly so that the new reservoir zone is enlarged while the old reservoir zone is reduced. This is done to ensure that the spare storage capacity in the new reservoir is utilised while the deficit in storage in the old reservoir could be reduced. • The boundaries of the New reservoir zone are increased to include future development areas B03 & B06 – B09. • It is further proposed that a PRV is installed on the main supply pipeline from the new reservoir feeding the Town area to reduce the pressure by 20m. A high occurrence of pipe breaks has been experienced in this area if the pressure is not relieved via a “choked” valve to the Town Central network.

Table 6.2.5: Future water reticulation infrastructure required
Ashton
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 distribution network. The most significant is the upgrading of the supply pipelines between Ashton WTW and Cogmanskloof reservoir to Langeberg and Ashton Foods through the Cogmanskloof zone network. Upgrading of the supply pipelines between the Conradiedorp reservoir and future development area A06 and the supply pipeline between the Zolani reservoir and future development area A07 are also required. Proposed distribution zones: • The Conradiedorp PRV zone is included in the Cogmanskloof zone. • The Cogmanskloof reservoir zone is increased to include future development areas A01 – A05 & A09. • The Conradiedorp reservoir zone is increased to include future development areas A06 & A08. • The boundaries of the existing Zolani zone are increased to accommodate future development areas A07, A10 & A11.
Montagu
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 distribution network as well as new supply pipelines for the new future development areas. A few inter-connection pipes and zone valves are also required to re-zone the existing Ashbury Lower network in order to incorporate the proposed Ashbury Upper zone. Proposed distribution zones: • A new Ashbury Upper zone is proposed for the higher lying areas in the existing Ashbury Lower zone and to accommodate future development areas M07 – M09, M12, M13 & M16. It is proposed that this zone is supplied from the existing Ashbury Upper reservoir. • The boundaries of the existing Montagu South, George Brink and Ashbury Lower zone are increased to accommodate the future development areas M01 – M06, M14, M15 & M18.

The Sewer Master Plan (March 2012) has indicated that based on the most likely land-use development scenario, the following future sewer reticulation infrastructure components will be necessary.

Table 6.2.6: Future sewer reticulation infrastructure required
Robertson
• The existing drainage areas are increased to accommodate proposed future development areas. • Upgrading of a few existing outfall sewers by replacement with larger sized sewers is proposed. • New gravity outfall sewers are required to collect the sewage from the FDAs R06 – R08, R16 and R24. • When Robertson PS reaches capacity, it should be upgraded to a capacity of 27 l/s and the existing rising main should be upgraded to a dia. of 200mm if high pump velocities are not desired.
McGregor
• The existing drainage area is increased to accommodate proposed future development areas Mc01 to Mc05. • When overflow problems occur in the 100mm – 200mm dia. section of outfall sewer near the McGregor WWTW due to the servicing of all stands and development of the future areas, these outfall sewers should be replaced with larger diameter. • A new PS and rising main is proposed for future development area Mc01. • All erven not serviced with waterborne sewers should be linked to the proposed sewer layout in order to extend the network to the entire McGregor town.
Bonnievale
• The existing drainage areas are increased to accommodate proposed future development areas. • New gravity outfall sewers are required to collect the sewage from future development areas B03 and B06 – B09. • When overflow problems occur in the 160mm dia outfall sewer in Milners Road in the Happy Valley drainage area and the 160mm dia. outfall sewer to PS No.4, these outfall sewers should be replaced with a larger diameter. The slopes of these outfall sewers were unknown and modelled on minimum slope and if the gradient turns out to be steeper, upgrades of these items might not be required. • No PS information was available and the pump capacities were therefore assumed according to the minimum required scouring velocities in each rising main. • When PS No.3 reaches capacity, it should be upgraded to a capacity of 105 l/s and the existing rising main should be upgraded to a diameter of 355mm.

Table 6.2.6: Future sewer reticulation infrastructure required
Ashton
• The existing drainage areas are increased to accommodate proposed future development areas. • New gravity outfall sewers are required to collect the sewage from future development areas A01 – A09. • A new PS and rising main that discharged into the existing Ashton Gravity drainage areas is proposed for the lower lying areas of future development area A07. • A number of existing outfall sewers require upgrading by replacement with larger sewers. The slopes of these outfall sewers were unknown and modelled on minimum slope and if the gradient turns out to be steeper, upgrades of these items might not be required. • When the Ashton PS reaches capacity, it should be upgraded to a capacity of 80 l/s and the existing rising main should be upgraded to a diameter of 315 mm.
Montagu
• The existing drainage areas are increased to accommodate proposed future development areas. • It is proposed that when development of FDA M11 commences, the existing Ashbury PS is decommissioned and the flow from the Ashbury drainage area is diverted with new gravity outfall sewers to the existing Montagu PS1 drainage area. • Upgrading of a few existing outfall sewers by replacement with larger sized sewers is proposed. • New gravity outfall sewers are required to collect the sewage from FDA M07. • When the Montagu PS No.2 reaches capacity, it should be upgraded to a capacity of 41 l/s and the existing rising main should be upgraded to a diameter of 250mm. • When Montagu PS No.1 reaches capacity, it should be upgraded to a capacity of 120 l/s and the existing rising main should be upgraded to a diameter of 355mm.

SEWER PUMP STATIONS

The Sewer Master Plan (March 2012) has indicated that based on the most likely land-use development scenario, it will be necessary for the following sewer pump stations:

Table 6.2.7: Future sewer pump stations required

Drainage System	Recommendations included in the Sewer Master Plan	When	Cost
Robertson	Investigate capacity of existing Nkqubela PS No.1	2012	R14 300
	Investigate capacity of existing Nkqubela PS No.2	2012	R14 300
	Investigate capacity of existing Nkqubela PS No.3	2012	R14 300
	Investigate capacity of existing Silwerstrand PS	2012	R14 300
	Upgrade existing Robertson PS to 27 l/s (Investigate first)	2016	R165 800
McGregor	New 5 l/s PS for FDA Mc01	2023	R342 200
Bonnievale	Investigate capacity of existing PS No.7	2011	R14 300
	Upgrade existing PS No.2 (Investigate first)	2012	R393 700
	Upgrade existing PS No.1 (Investigate first)	2012	R356 500
	Investigate capacity of existing Abattoir PS	2012	R14 300
	Upgrade existing PS No.5 (Investigate first)	2012	R356 500
	Upgrade existing PS No.6 to 50 l/s	2014	R193 400
	Upgrade existing PS No.4 to 40 l/s	2015	R148 300
	Upgrade existing PS No.3 to 105 l/s	2022	R337 900
	New 5 l/s PS	2024	R342 200
Ashton	Investigate capacity of existing Unipack PS	2012	R14 300
	Upgrade existing Ashton PS to 78 l/s	2019	R234 000
	New 5 l/s PS when FDA A07 develops	2024	R342 200
Montagu	Abandon existing Ashbury PS	2014	R143 300
	Upgrade existing Avalon Springs PS to 14 l/s (Investigate first)	2017	R123 000
	Upgrade existing Montagu PS (M1) to 120 l/s	2022	R377 800
	Upgrade existing Montagu PS (M2) to 41 l/s	2023	R193 400
Total			**R4 150 300**

WASTE WATER TREATMENT INFRASTRUCTURE

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

Table 6.2.8: Existing capacities and flows at each of the WWTWs for the period July 2012 to June 2013 (Ml/d)

WWTW	Existing Hydraulic Capacity	Peak Month Average Daily Flow	Average Daily Flow	Average Wet Weather Flow
Robertson	8.677	4.318 (Febr)	4.132 *	4.205 (Oct)
McGregor	0.300	0.331 (Jul)	0.168	0.253 (Jun, Jul, Aug)
Bonnievale	1.840	1.180 (Aug)	0.975	1.037 (Jun, Jul, Aug)
Ashton	2.430	2.243 (Febr)	2.114	2.117 (Jun, Jul, Aug)
Montagu	1.800	2.176 (Jul)	1.944	2.091 (Jun, Jul, Aug)

Note: * Robertson WWTW, average for period October 2012 to May 2013.

The section below gives an overview of the conclusions included in the detail WWTW Technical Process Audits that were completed during 2013 for all the WWTWs.

Robertson WWTW: The WWTW is currently operating below its design capacity, but is not meeting the required effluent discharge standards, as stipulated by the DWA. The upgrades which are currently underway should result in better effluent quality. There are however some components which need to be upgraded and refurbished.

McGregor WWTW: The WWTW is still in good operating condition with the exception of a few minor items that require some attention. The works is currently receiving greater flows than it was designed for, but still produces effluent quality which is well within the required limits (possibly due to the empirical and conservative design approach used for ponds systems). No upgrades are thus proposed, but effluent quality should be closely monitored. Currently flows are measured at the irrigation PS and therefore dos not record the real flows of incoming wastewater. It is therefore proposed that flow measurement is instated at the inlet of the works.

Bonnievale WWTW: The WWTW is currently operating below the design capacity and will not require any upgrade or extensions in the near future. The works is still in a very good condition. The only significant issue is sludge handling. It is proposed that alternate solutions are investigated for sludge dewatering / drying during the winter months.

Ashton WWTW: The WWTW is currently operating close to its design capacity and is not meeting the required effluent discharge standards, as stipulated by DWA in the Water Use License which corresponds with the General Limits stipulated in the General Authorisations. As a result it is recommended that the Works be refurbished and upgraded to ensure compliance and meet the projected future demands until 2035.

Montagu WWTW: The WWTW is currently overloaded and produces substandard effluent. As a result it is recommended that the works be refurbished and upgraded to ensure compliance and meet the projected future demands until 2035.

ASSET MANAGEMENT ASSESSMENT

The total replacement value of the water infrastructure in the asset register is too low. Not all the water reticulation networks are included in the asset register. The water infrastructure in the asset register should be checked to ensure that all network items are listed and that items are correctly priced. The total replacement value in the asset register should be reviewed.

The O&M budget allocated to repairs and maintenance seems a bit low and additional budget should be allocated to address amongst other tasks the replacement of malfunctioning and old consumers meters, clearing of meter boxes, buying replacement mechanisms for bulk meters, speedy repair of leaks, leak detection in areas with higher than expected night flows, etc. It is important for Langeberg Municipality to differentiate between budget allocated towards the operation and maintenance of the water infrastructure and budget for the replacement of infrastructure. A budget of approximately 2% of the total asset value per annum

should be allocated towards the replacement of existing infrastructure. In the case of operations and maintenance of the system, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the system remains in good condition.

It is important for Langeberg Municipality to develop an AMP from their 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. Langeberg Municipality needs to 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 increase 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.

7. OPERATION AND MAINTENANCE

7.1 Status Quo

Langeberg Municipality drafted their first Water Safety Plan during the 2013/2014 financial year. A qualified, dedicated team was established by Langeberg Municipality for the drafting of their Water Safety Plan. A detailed risk assessment was executed as part of the process and the existing control measures implemented by Langeberg Municipality were evaluated. 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. Water and Safety Management Procedures were also developed for various types of incidents.

The Municipality is also busy with the drafting of a W_2RAP for the various WWTWs. The W_2RAP is an all-inclusive risk analysis tool by which risks associated with the management of collection, treatment and disposal of wastewater, are identified and rated (quantified). The identified risks can then be managed according to its potential impacts on the receiving environment / community / resource.

Comprehensive Operational and Maintenance Manuals (O&M) were also drafted for all the WTWs and WWTWs during 2013/2014. The O&M Manuals were written as a guide for the Process Controllers for the operation of the plants and deals with day-to-day activities required in the operation of the treatment process. It also lists the checks to be carried out by the Process Controllers on the mechanical and electrical equipment.

The Manuals does not deal with the maintenance of the specific mechanical and electrical equipment, but do provide general guidelines. The specific activities should be described in the O&M Manuals which contains the mechanical and electrical equipment operating manuals supplied by the equipment contractors and / or suppliers. The O&M Manuals must be read in conjunction with the Contractors' Manuals.

An Incident Response Management Protocol was developed and needs to forms part of Langeberg Municipality's Water Safety Plan. The Incident Response Management Protocol entails that certain reactive procedures are followed when an incident occurs, such as when a malfunction of the treatment processes occurs due to power failures, faulty equipment, adverse weather conditions or human error.

Operational and Compliance Water Quality and Final Effluent Quality Monitoring Programmes were drawn up by Langeberg Municipality and are implemented by the Municipality.

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 in its fifth 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 Langeberg Municipality is summarised as follows in the DWA's 2012 Blue Drop Report:

Table 7.1.1: Blue Drop Performance of the Municipality (DWA's 2012 Blue Drop Report)

Municipal Blue Drop Score	**51.62%**

Regulatory Impression: Even though the scores are not reflecting a satisfactory performance as yet, the Department is impressed by improvements recorded in almost every aspect of the listed regulatory requirements. The municipality is commended for this remarkable effort and encouraged to proceed on this positive path. However for further improvement to materialise it is required that the management and governance aspects are strengthened on matters pertaining to effective drinking water quality management. The scores under KPA 4 are not impressive and should serve as a guide for municipal management to support and commit to further improvements.

In the words of the Lead Inspector: *"Langeberg has a significant scope for improvement in their overall Blue Drop performance. The inspector is however of the opinion that the Langeberg officials can make significant strides in the right direction given the commitment and drive demonstrated during the assessment."*

Special attention should be given to process optimisation with the objective to eradicate the occurrence of failures – disinfection processes and coagulant dosing should be prioritised. The microbiological (affected by some E-coli failures) and chemical (affected by mostly Aluminium failures) compliance affected the 2012 Blue Drop scores significantly. Should these processes be addressed, the next cycle will present the opportunity for even further enhancements.

Site Inspection (Robertson WTW score 63.9%): The inspectors found the works to be in acceptable condition even though there is evidently space for improvement on occupational health and safety aspects (such as low hand railings, insufficient walkways around clarifier, a broken door, breathing apparatus not on site at the chlorine room, no shower and eye wash at the chemical preparation area etc.) The team also found the flocculation chambers to be filled up with scum but also very difficult to clean due to the covers. Attention is required on this matter. The non-availability of a maintenance logbook and Operations and Maintenance manual is not ideal for the effective management of operations. The nozzles in the sand filters might require attention since air distribution is found not to be even during the test backwashing procedure.

Performance Area	Robertson	Ashton	Bonnievale	McGregor	Montagu
Water Safety Planning	**55**	**44**	**53**	**58**	**53**
Treatment Process Management	**75**	**66**	**66**	**75**	**40**
DWQ Compliance	**0**	**41**	**27**	**55**	**100**
Management, Accountability	**28**	**28**	**28**	**28**	**23**
Asset Management	**53**	**40**	**43**	**37**	**43**
Bonus Scores	6	6	6	5.69	4.66
Penalties	0	0	0	0	0
Blue Drop Score (2012)	**43.31%**	**48.99%**	**48.31%**	**58.26%**	**65.80%**
Blue Drop Score (2011)	29.48%	33.50%	33.50%	48.50%	33.58%
Blue Drop Score (2010)	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
System Design Capacity (Ml/d)	11.2	14.5	4.5	1	6
Operational Capacity (% i.t.o. Design)	59.82	48.28	66.67	90.00	91.67
Population Served	35 000	10 000	10 000	10 000	30 000
Average daily consumption (l/p/d)	191.43	700.00	300.00	90.00	183.33
Microbiological Compliance (%)	**89.1%**	**96.3%**	**91.2%**	**97.8%**	**99.9%**
Chemical Compliance (%)	**92.0%**	**91.5%**	**96.4%**	**92.0%**	**99.9%**

The DWA also completed their Second Order Assessment of Municipal WWTWs and drainage systems, DWA's Green Drop Progress Report for 2011, 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 Langeberg Municipality is summarised as follows in the DWA's 2011 Green Drop Report:

Table 7.1.2: Green Drop Performance of the Municipality (DWA's 2011 Green Drop Report)	
Average Green Drop Score	**43.0%**

Regulatory Impression: The wastewater service management performance of Langeberg (Breede River Winelands) remains more or less the same since 2009 Green Drop assessment. This municipality became synonymous for uncooperative representation at regulatory assessments which is most unfortunate and unpleasant. Yet in spite of a rather unkind reception from the municipal representative the assessment team remained objective.

The municipal wastewater service management impressed with the relatively superior effluent quality compliance which is certainly commendable for this smaller municipality. This is also reason for the inspiring risk ratings (low cumulative risk rating variance). It is evident that Langeberg has adequate process management skill to ensure the effluent compliance levels recorded. Yet the process control skill is noted as insufficient; the sustainability of this compliance record is under threat if this element is not addressed soonest.

The Department is confident that Green Drop certification is a certain possibility in the near future should the municipality build on this performance recorded.

Green Drop Findings:

1. No operation and maintenance manual for any of the plants was presented which is a certain contingency risk factor.
2. Another risk factor would be that there is no incident / failure response protocol in place.
3. Asset Management can be improved. It would be in best interest of improved Green Drop scoring if portfolio of evidence is compiled in preparation for future assessments.

Site Inspection Scores:

Robertson 46%

Ashton 23%

The appearance of both works inspected was poor and showed sign of general neglect.

At the Robertson works the following was observed:

- Sludge was dumped on the ground to dry but no visible attempt to remove it.
- Grit removal seems insufficient.
- The primary settling tanks presented dried scum in the overflow weirs; indicative of ineffective operations.
- Dry areas on the trickling filter media suggest inefficiencies at this unit process.
- The sludge drying beds were found in excellent condition though.
- Most problematic would be the clear water surface channel which runs through the wastewater treatment site, which is at risk of contamination when flooding conditions persist.

The Ashton works were not in good shape at all. The following was observed:

- Rags and traces of sludge spill were evident.
- Workers area was not in good shape which hardly inspires workers commitment.
- At the time of assessment components of the primary settling unit process was out of order.
- Disinfection process requires improvement. There was only one chlorine gas tank on site with no scale.
- Flow meters on regulators found not functional.

Table 7.1.2: Green Drop Performance of the Municipality (DWA's 2011 Green Drop Report)					
Criteria	**Robertson**	**Ashton**	**Bonnievale**	**McGregor**	**Montagu**
Process Control, Maintenance and Management Skill	58	5	58	50	5
Monitoring Programme	**40**	40	40	30	40
Credibility of Sample Analysis	61	61	61	61	61
Submission of results	**75**	**75**	**75**	75	75
Wastewater Quality Compliance	**5**	**50**	**5**	100	60
Failure Response Management	**0**	**28**	**0**	**0**	**0**
Bylaws	**40**	**70**	**40**	**40**	**70**
Treatment and Collector Capacity	60	23	**60**	58	30
Asset Management	40	**25**	40	**25**	**25**
Bonus Scores	4.8	1.87	4.8	2.8	4.8
Penalties	0	3	3	0	0
Green Drop Score (2011)	**36.9%**	**40.4%**	**48.8%**	**51.4%**	**44.4%**
Green Drop Score (2009)	49%	49%	49%	52%	49%
Treatment Capacity (Ml/d)	4.200	4.000	4.000	0.400	3.500
Operational % i.t.o. Capacity	78.6%	62.5%	66.7%	NI (assume >100%	NI (assume >100%
Cumulative Risk Rating (CRR)	18	11	9	12	15
% i.t.o. Maximum Risk Rating	64.8%	40.7%	33.3%	44.4%	55.79%

The 2012 Green Drop Risk Profile Progress Report of the DWA is further the product of a "gap" year, whereby progress is reported in terms of the improvement or decline in the risk position of the particular WWTW, as compare to the previous year's risks profile. This tool to collect, assess and report the risk profile is called the Green Drop Progress Assessment Tool (PAT). The PAT progress assessment period was done on compliance data and actions during July 2010 to June 2011, which represents the year immediately following the Green Drop 2011 assessment period.

Table 7.1.3: DWA's 2012 Green Drop Risk Profile Progress Report results for Langeberg Municipality

Assessment Area	Robertson	Ashton	Bonnievale	McGregor	Montagu
Technology	Activated sludge and mechanical aeration Anaerobic digestion	Activated sludge and mechanical aeration Anaerobic digestion	Activated sludge and mechanical aeration Solar / Thermal drying beds	Aerated lagoons / Oxidation ponds	Activated sludge and mechanical aeration Solar / Thermal drying beds
Design Capacity (Ml/d)	4.200	4.000	4.000	0.400	3.500
Operational % i.t.o. Design Capacity	66.7%	49.5%	22.5%	57.5%	58.5%
Microbiological Compliance	83.33%	91.7%	100.0%	83.0%	66.7%
Chemical Compliance	54.17%	51.9%	68.8%	37.5%	35.4%
Physical Compliance	91.67%	94.4%	91.7%	86.1%	91.7%
Annual Average Effluent Quality Compliance	**76.39%**	**79.3%**	**86.8%**	**68.9%**	**64.6%**
Wastewater Risk Rating (% CRR / CRR_{max})	**64.7%**	**52.9%**	**47.1%**	**58.8%**	**58.8%**
Highest Risk Area	Effluent quality	Effluent quality	Flow, effluent quality	Effluent quality	Effluent quality
Risk Abatement Process	No W_2RAP	No W_2RAP	No W_2RAP	No W_2RAP	No W_2RAP
Capital & Refurbishment expenditure in 2010/2011	R0	R30 000	R0	R0	R9 000
Description of Projects' Expenditure	N/A	Various maintenance works	N/A	N/A	Booster pump

7.2 Gaps and Strategies

The Water Safety Plan and W_2RAP Teams of Langeberg Municipality are committed to meet regularly to review the implementation of all the aspects of the Water Safety Plan and W_2RAP to ensure that they are still accurate and to determine whether the field assessments need updates or modifications and whether the Incident Response Management Protocol is still adequate. In addition to the regular three year review, the Water Safety Plan and W_2RAP 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 incident.

It is important for Langeberg Municipality to classify all treatment works and operators along the lines of the regulations by establishing a programme for certification of works, operators, technicians and managers. The process will include reviewing the skills needed and aligning resources to these needs as well as reviewing total staff numbers necessary to meet all the objectives in the National Water Act.

It is important for Langeberg Municipality to establish a mentoring role for operators ensuring an 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.

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 Langeberg Municipality to compile a Legal Compliance Audit of their WTWs and WWTW, which will provide the management of Langeberg Municipality with the necessary information to establish whether the Municipality is in compliance with the legislation or not.

Based on the existing Water Quality Operational Sampling Programme and the minimum SANS241:2011 monitoring frequency for process indicators it is recommended that the following additional operational sampling be done by Langeberg Municipality:

- Electrical Conductivity of the raw water and the final water at all the WTW on a daily basis.
- Turbidity of the raw water on a daily basis and the final water at the McGregor WTW once per shift.
- pH, Turbidity and disinfectant residuals at the sampling points in the distribution networks fortnightly.

Monthly microbiological compliance samples also need to be taken at an additional three sample sites in Robertson.

The additional monitoring required by Langeberg Municipality for determinands identified during the risk assessment exceeding the 2014 DWA Blue Drop numerical limits are as follows (Water quality samples taken over the period January 2013 to December 2013):

Table 7.2.1: Additional monitoring required by Langeberg Municipality for determinands identified during the risk assessment exceeding the 2014 DWA Blue Drop numerical limits (January 2013 – December 2013)

Performance Indicator	Performance Indicator categorised as unacceptable (Yes / No) (Categorisation according to Table 4 of SANS 241-2:2011)	% Sample Compliance according to 2014 DWA Limits	Frequency of Additional Monitoring due to failure
Robertson			
Acute Health – 1 Microbiological	No (Excellent)	97.9%	-
Chronic Health	Yes (Unacceptable)	89.4%	Monthly
Aesthetic	No (Excellent)	97.5%	-
Risk assessment defined Health (Acute or Chronic)	No (Good)	94.1%	-
Operational Efficiency	Yes (Unacceptable)	74.5%	Weekly
McGregor			
Acute Health – 1 Microbiological	No (Excellent)	100.0%	-

Table 7.2.1: Additional monitoring required by Langeberg Municipality for determinands identified during the risk assessment exceeding the 2014 DWA Blue Drop numerical limits (January 2013 – December 2013)			
Performance Indicator	**Performance Indicator categorised as unacceptable (Yes / No) (Categorisation according to Table 4 of SANS 241-2:2011)**	**% Sample Compliance according to 2014 DWA Limits**	**Frequency of Additional Monitoring due to failure**
Chronic Health	No (Excellent)	100.0%	-
Aesthetic	No (Excellent)	97.4%	-
Risk assessment defined Health (Acute or Chronic)	No (Excellent)	100.0%	-
Operational Efficiency	Yes (Unacceptable)	82.7%	
Bonnievale			
Acute Health – 1 Microbiological	No (Excellent)	98.6%	-
Chronic Health	Yes (Unacceptable)	75.0%	Monthly
Aesthetic	No (Excellent)	97.5%	-
Risk assessment defined Health (Acute or Chronic)	Yes (Unacceptable)	87.1%	Monthly
Operational Efficiency	Yes (Unacceptable)	74.2%	Weekly
Ashton			
Acute Health – 1 Microbiological	Yes (Unacceptable)	93.6%	Weekly
Chronic Health	Yes (Unacceptable)	87.2%	Monthly
Aesthetic	No (Excellent)	96.8%	-
Risk assessment defined Health (Acute or Chronic)	Yes (Unacceptable)	92.0%	Monthly
Operational Efficiency	Yes (Unacceptable)	71.5%	Weekly
Montagu			
Acute Health – 1 Microbiological	No (Excellent)	100.0%	-
Chronic Health	Yes (Unacceptable)	73.5%	Monthly
Aesthetic	No (Excellent)	98.6%	-
Risk assessment defined Health (Acute or Chronic)	Yes (Unacceptable)	86.7%	Monthly
Operational Efficiency	Yes (Unacceptable)	82.9%	Weekly

The table below gives an overview of the five categories under which the risks posed by micro-organism, physical or aesthetic property or chemical substance of potable water is normally classified:

Table 7.2.2: Five categories under which the risks posed by micro-organism, physical or aesthetic property or chemical substance of potable water is normally classified	
Category	**Risk**
Acute Health - 1	Routinely quantifiable determinand that poses an immediate unacceptable health risk if consumed with water at concentration values exceeding the numerical limits specified in SANS 241.
Acute Health - 2	Determinand that is presently not easily quantifiable and lacks information pertaining to viability and human infectivity which, however, does pose immediate unacceptable health risks if consumed with water at concentration values exceeding the numerical limits specified in SANS 241.
Aesthetic	Determinand that taints water with respect to taste, odour and colour and that does not pose an unacceptable health risk if present at concentration values exceeding the numerical limits specified in SANS 241.
Chronic Health	Determinand that poses an unacceptable health risk if ingested over an extended period if present at concentration values exceeding the numerical limits specified in SANS 241.
Operational	Determinand that is essential for assessing the efficient operation of treatment systems and risks from infrastructure

It is also important to note that all operational manuals of treatment unit processes such as chemical dosing, coagulation sedimentation, filtration, disinfection etc. should contain operational limits, monitoring programmes, verification procedures and pre-determined corrective actions. Corrective actions identified for each control measure need to be adhered to as soon as critical limits have been exceeded. The corrective actions are an important component of the management aspects of the Water Safety Plan and should be effective in restoring performance to acceptable levels when critical limits are exceeded.

Langeberg Municipality is committed to work with the DWA and the other role-players in order to improve on their 2012 Blue Drop Score for the various distribution systems even further. Detail Process Audits were carried out for all the WTWs and the Municipality will ensure that the recently developed O&M Manuals for the WTWs are implemented and used by the Process Controllers. Langeberg Municipality is also committed to implement the recommendations from the Process Audits and the Improvement / Upgrade Plan, which was compiled as part of the Water Safety Plan, in order to address the potential risks and shortcomings.

Langeberg Municipality is also committed to manage and operate sewage pump stations effectively to prevent any possible spillages. It is important for Langeberg Municipality to continue with the upgrading of the 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.

Langeberg Municipality should continue and improve the level and frequency of regular sampling (Operational and Compliance Monitoring) and reporting on wastewater quality.

The knowledge, skills, motivation and commitment of staff involved in the management of waste water quality are the most important factors that determine the ability of Langeberg Municipality to comply with the quality of treated effluent discharge from the WWTWs. Training of all staff involved in sanitation 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 environment.

An Incident Response Management Protocol will be developed for Langeberg Municipality as part of the W_2RAP. The purpose of the Incident Response Management Protocol is to plan for failures at the WWTWs and subsequent methods to address such failures.

A set of Operational Alert Levels will also be drawn up as part of the W_2RAP. The set of Operational Alert Levels will be used by the Process Controllers, with the newly developed O&M Manuals, to further improve the performance of the various WWTWs.

A set of Compliance Alert Levels, corresponding to the requirements of the General Standard (at present), is implemented by the Municipality and forms part of the Municipality's current Compliance Monitoring Incident Management Protocol. SOPs should also be developed for each of the components of the WWTWs.

Various mechanisms were put in place over the last year in order to increase Langeberg Municipality's Green Drop performance and to get the Municipality ready for the next round of assessments. Langeberg will also compile a W_2RAP for each of their WWTWs, in order to reduce their current CRRs for the various WWTWs. The following will also further assist in the process of reducing the CRRs of the WWTWs.

- 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 innovative methods to ensure enhancement of effluent quality.

8. ASSOCIATED SERVICES

8.1 Status Quo

All the schools, hospitals and clinics in Langeberg Municipality's Management Area are supplied with a higher level of water and sanitation services.

8.2 Gaps and Strategies

Langeberg Municipality will strive to continue to ensure that the minimum required SANS241:2011 water quality standards are met through the systematic upgrading of their WTWs. A Water Safety Plan was compiled for all the distribution systems in Langeberg Municipality's Management Area and detail Process Audits were carried out at all the WTWs. The monitoring of provision of basic minimum services to farm dwellers remains a challenge, in view of the limited funding and human resources.

The establishment and functioning of effective health systems and health care services is critical for not only the upliftment of communities but more so for the sustainability of communities. Health services are rendered throughout the area by a network of clinics. 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 Langeberg Municipality with regard to environmental health issues and that a proper communication system exists between the District Municipality and Langeberg Municipality to report on health issues.

The most vulnerable groups within the urban areas of Langeberg Municipality's Management Area are the persons lining in informal areas with shared services or no services. It is 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 Langeberg Municipality. 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.

9. CONSERVATION AND DEMAND MANAGEMENT

9.1 Status Quo

A detail WC/WDM Strategy was developed for Langeberg Municipality during 2013/2014. Various bulk water meters were also logged as part of the process, in order to determine the MNFs and pressures for the various distribution areas.

The highest potential to reduce NRW is in Ashton and Bonnievale where the NRW was 32.5% and 35.6% respectively. The target should be to reduce the NRW in Ashton and Bonnievale to the same levels as the other three towns. Per capita consumptions in all towns are not excessive, especially if the water usage from top consumers are excluded (Industrial, commercial and large public buildings using > 20 kl/d). In this regard the potential to reduce per capita usage is seen as moderate.

The table below gives an overview of the theoretical scope for physical water savings through WC/WDM in Langeberg Municipality's Management Area. The actual savings achievable will depend on the effort, time and budget allocated to WC/WDM. The figures shown in the table can be deducted in annual increments (over a five or ten year period) from the future water supply projection volumes for each town to create a theoretical WC/WDM scenario for each town.

Table 9.1.1: Theoretical scope for physical water savings (m^3/year)

Water Saving	Robertson	McGregor	Bonnievale	Ashton	Montagu
Theoretical maximum scope for water savings	200 000	20 000	150 000	200 000	100 000

The main water demand management interventions undertaken by Langeberg Municipality over the last few years were as follows:

- Updated Water Master Plans were put in place for all the towns.
- Pipe replacement and maintenance programme for the priority areas with old reticulation networks and frequent pipe failures. All pipe bursts are logged.
- Customer services and complaints system (Burst pipes, complaints, etc.). Standby teams are also in place for immediate repairs of burst pipes.
- Bulk metering and telemetry system, which act as an early warning system for e.g. pipe failures and reservoir overflows.

- Accurate records of water usage and water losses. Water balance models for each of the distribution systems are kept up to date.

- Strict municipal services standards for the installation of new water reticulation for own and private developments.

The table below gives an overview of the newly developed WC/WDM Strategy for Langeberg Municipality.

Table 9.1.2: WC/WDM Strategy for Langeberg Municipality

No	Item	Summary of Tasks	Estimated Cost	Potential Water Saving or Reduction in Demand	Priority
1	Water Audit	Update water balance annually	Water balance can be undertaken by Mun.	None	1
2	Pressurised System	None	None	None	N/A
3 & 4	Consumer Metering	Complete Meter Audit. All illegible / broken meters should be replaced and any un-metered stands identified should be metered. All meter readings in the billing system should be updated. As part of the audit all meter boxes should also be cleaned.	Meter audit and cleaning of meter boxes at approximately 18 000 stands R720 000 Budget to replace illegible / broken meters: To be determined after the meter audit.	Additional metered consumption if all meter boxes are cleaned, broken meters replaced and accurate readings obtained: 5% improvement in billed consumption: 280 000 kl/a	1
5	Effective and Informative Billing System	Mun. may consider to alert consumers of possible leaks on their properties. For instance if the consumption for a particular month is >20% than the average consumption of the previous months the consumer may be alerted of a possible leak on the property. Mun. may also consider adding a graph of the previous 12 months' consumption and helpful hints on effective water usage on the monthly bills.	Cost to enhance the user friendliness of the municipal bill: Estimate R60 000	Difficult to estimate what the impact will be but in long term it will be to the benefit of the municipality and consumers	3
6 & 7	Complaints System	The Municipality should continually ensure that consumers are familiar with the telephone numbers to lodge complaints / report leaks – this can be linked to awareness campaign on WC.	None	None	N/A
8	Asset Register	The total value of water infrastructure in the asset register is too low. The asset register should be checked to ensure that all network items are listed and that items are correctly priced.	Undertaken by Mun. or service provider that prepared the asset register.	None	N/A
9	Asset Management: Capital Works	The Mun. should continue to allocated budget for the upgrading / replacement of water infrastructure in Langeberg – as they have done over the last number of years.	None	None	N/A
10	Asset Management: O&M	The O&M budget allocated to repairs and maintenance should be increased to address amongst other tasks the following: Replacement of malfunctioning and old consumer meters, clearing of meter boxes, buying replacement mechanisms for bulk meters, speedy repair of leaks, leak detection in areas with higher than expected night flows.	To be determined by Municipality	Difficult to estimate what the impact will be but in long term it will be to the benefit of the municipality.	2
11	Dedicated WC/WDM Support	For a start the Mun. should allocated at least one person to head WC/WDM. The number of people	The Mun. may be able to use one of their existing staff members. If a new	No direct saving – but seen as crucial for effective WC/WDM	1

Table 9.1.2: WC/WDM Strategy for Langeberg Municipality					
No	**Item**	**Summary of Tasks**	**Estimated Cost**	**Potential Water Saving or Reduction in Demand**	**Priority**
		involved with WC/WDM can later be increased as and when required.	person has to be appointed the Mun. can determine the costs involved with such an appointment	program.	
12	Active Leakage Control	Currently minimal visible leakage on the water network. In the night flow analysis some zone were identified with higher than expected leakage. 1) obertson Reservoir 1 2) kqubela Reservoir 3) onnievale New Reservoir East. It was not possible to measure night flows in Zolani in Ashton – and it's possible that this area will also have excess night flow.	R200 000 to undertake leak detection / inspections in zones with high excess night flows. Budget to repair any leaks identified will be determined after the inspection. R100 000 / year for annual visual leak inspections.	Estimate 1% of Input Volume = 80 000 kl/a	2
13	Sectorising	The individual water reticulation systems have already been sectorised. Zones have not yet been checked for discreteness. During the logging exercise some zone interconnections were discovered.	A budget should be allocated to investigate and resolve the zone interconnections listed and any other connections that the operational staff suspects. Difficult to price such investigations. Possible budget R200 000	No direct saving, but zone discreteness will assist the municipality to measure zonal usage and losses more accurately.	3
14	Bulk Metering	No additional meters required at this stage.	None	None	N/A
15	Zone Meter Management	Install bulk meters at locations identified in the WDM Strategy. Montagu (x4), McGregor (x2), Ashton (x4), Bonnievale (x2) and Robertson (x5). Record bulk meter readings monthly for all bulk meters not only for meters at the treatment plants. Keep stock of meter inserts at depot so that meters can be replaced as soon as the municipality becomes aware of a faulty meter.	Installation of new bulk meter with isolating valves and strainers in brick chamber. R760 000 Replace / repair broken meters R40 000 MNFs should be measured and analysed annually. Permanent loggers can be considered at critical meters. Allow R200 000 for general logging / logging equipment.	No direct saving, but accurate bulk metering and monitoring of night flows will assist the municipality to monitor usage and losses more accurately.	2
16	Pressure Management	The existing Robertson PRV should be serviced and set. This PRV is not currently working. The scope for further pressure management was evaluated by GLS Consulting as part of the WDM Strategy project. Further analysis will however be required to determine the exact scope, potential cost and viability for pressure management implementation in each of the areas. A total of seven possible areas were identified. If found to be feasible, pressure management should be implemented in selected areas.	Service and set PRV at Robertson R6 000 Budget for detailed analysis to determine exact scope for pressure management R200 000 Budget to implement pressure management. To be determined as part of the detailed analysis.	Potential saving form implementing pressure management in 7 identified areas: 5% of input volume = 380 000 kl/a.	2

Table 9.1.2: WC/WDM Strategy for Langeberg Municipality					
No	**Item**	**Summary of Tasks**	**Estimated Cost**	**Potential Water Saving or Reduction in Demand**	**Priority**
17	As-Build Drawings	No tasks	None	None	N/A
18	Schematic Layouts	Schematic layouts have been prepared for Langeberg Mun.	None	None	N/A
19	Regulation of water fittings	The mun. should add a section on authorised fittings in the water bylaws. The use of authorised fittings should then be enforced.	Can be undertaken by Mun. or by consultant updating the water by-laws.	Difficult to estimate what the impact will be but in long term it will be to the benefit of the municipality.	3
	By-laws	The mun. should update their water bylaws to address WC. These by-laws should then be enforced.	Can be undertaken by Mun. or by consultant updating the water by-laws.	Difficult to estimate what the impact will be but is expected to make consumers more aware.	3
20	Tariffs	It is recommended that the mun. adopt a block tariff system. Such a rising block tariff can be phased in over a number of years. The actual charges per block should be determined in a separate study. The benefit of adding categories in the block tariff system is that the mun. will be able to generate additional income through consumers with excessive consumption, but that consumers will also become more aware of managing and reducing their own water consumption.	The cost for the study to determine the best suited block tariff system for Langeberg: Est R80 000	Reduce consumption 1% of potable Input Volume = 50 000 kl/a	1
21	Technical support to consumers	Once a dedicated persons has been appointed to WC/WDM it is recommended to engage with large customers and to identify areas where the mun. can provide assistance.	None additional – pending on the appointment of a dedicated person for WC/WDM.	Difficult to estimate what the impact will be but is expected to make consumers more aware.	2
22	Removal of illegal connections	According to the Langeberg Mun. there are few un-metered or un-authorised connections that they are aware of.	None	None	N/A
23	Community awareness on WDM	It is estimated that R60 000/year should be allocated for WC awareness activities and material to be included in monthly water bills.	R60 000 / year	More direct impact on consumption but seen as crucial part of overall WC/WDM program.	2
24	Schools Education on WDM	Once a year a schools education programme on WC should be undertaken. The Mun. should assist the school with the monitoring (water audit) of their water consumption.	R40 000 / year	Minor direct impact on consumption but seen as crucial part of overall WC/WDM program.	2
25	Retrofit internal plumbing leaks	An exercise could be initiated to check for visual leakage at public buildings and households using more than 6 kl/month. Where possible the mun. can assist these properties to repair visual leaks and to inform the consumers to repair such leaks in future. Special focus on indigent consumers.	R100 000 for ongoing exercise to repair leakages at properties using in excess of 60 kl/month. EPWP funding can possibly be used.	Estimate 0.4% of Input Volume in Bonnievale and Ashton = 30 000 kl/a.	2
Total			**Once off costs R2.6 million.** **Annual costs for ongoing tasks R0.2 million / annum**	**Improvement in billing 280 000 kl/a.** **Water Savings 490 000 kl/a.** **Reduction in consumption: 50 000 kl/a.**	

The table below gives a summary of the non-revenue water and the ILI for the various distribution systems in Langeberg Municipality's Management Area.

Table 9.1.3: Non Revenue water and ILI for the various distribution systems				
Distribution System	**Unit**	**12/13**	**Record : Prior (Ml/a)**	
			11/12	**10/11**
Robertson	Volume	334.348	982.480	705.362
	Percentage	14.99%	33.20%	24.76%
	ILI	**2.4 (1.9)**		
McGregor	Volume	62.816	78.927	25.392
	Percentage	23.81%	27.35%	10.06%
	ILI	**5.6 (4.8)**		
Bonnievale	Volume	569.645	473.684	318.298
	Percentage	35.60%	30.57%	21.30%
	ILI	**8.6 (7.6)**		
Ashton	Volume	688.779	597.627	289.296
	Percentage	32.46%	28.23%	15.57%
	ILI	**12.03 (11.9)**		
Montagu	Volume	285.656	119.693	73.523
	Percentage	20.08%	9.16%	5.37%
	ILI	**3.03 (2.4)**		
TOTAL	**Volume**	**1 941.244**	**2 252.412**	**1 411.872**
	Percentage	**25.41%**	**27.40%**	**18.05%**
	ILI	**5.16 (4.5)**		

Notes:
ILI Values in brackets as calculated by GLS
Infrastructure Leakage Index (ILI) for Developed Countries = **1 – 2 Excellent (Category A)**, **2 – 4 Good (Category B)**, **4 – 8 Poor (Category C)** and > **8 – Very Bad (Category D)**

Category A = No specific intervention required.

Category B = No urgent action required although should be monitored carefully.

Category C = Requires attention

Category D = Requires immediate water loss reduction interventions

The Infrastructure Leakage Index (ILI) in the above table 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". A high ILI value indicates a 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. A value of less than 1 should not occur since this implies that the actual leakage is less than the theoretical minimum level of leakage.

9.2 Gaps and Strategies

Langeberg Municipality has responded to the need to address water losses and non revenue water within their jurisdiction by developing a detail WC/WDM Strategy and will actively implement the proposed WC/WDM measures in order to reduce the non revenue water and improve water use efficiency within the various distribution systems as follows:

Table 9.2.1: Commitment to reduce the percentage of non-revenue water

Distribution System	2012/2013 (%/a)	2017 (%/a)	2037 (%/a)
Robertson	15.6%	15%	15%
McGregor	27.1%	20%	15%
Bonnievale	35.6%	25%	15%
Ashton	34.4%	25%	15%
Montagu	20.1%	15%	15%

Langeberg Municipality is committed to continue in the future with the monitoring the MNFs for specific zones, in order to identify areas for the implementation of specific WDM activities (Pressure Management, Repair of leaks, etc.). The Municipality will also in the future install zone meters in the various distribution systems and link these to the financial data, in order to accurately determine the percentage of non revenue water for the specific zones.

The zones identified as part of the night flow analysis with higher than expected leakage were as follows:

- Robertson Reservoir 1
- Nkqubela Reservoir
- Bonnievale New Reservoir East

It was not possible to measure night flows in Zolani in Ashton, but it is possible that this areas will also have excess night flow. It is estimated that a budget of R200 000 will be adequate to undertake leak detection in zones with high night flows. It will be necessary to allocate approximately R100 000 per year additional for general visual leak inspections. It is recommended to re-log the night flows very few years to evaluate if there has been an increase in leakage.

Langeberg Municipality is committed to continue to monitor the abstraction from all their sources and to meter all water used by consumers within the various towns. Some reservoir inlets and outlets are metered, but may still require meters. The additional bulk water meters proposed in the WC/WDM Strategy Report are four for Montagu, two for McGregor, four for Ashton, two for Bonnievale and five for Robertson. It is important that all bulk meter readings are recorded monthly and not only the WTW's meters.

The billing data assessment undertaken by GLS Consulting identified the following metering anomalies.

- 1 028 Properties had recorded water use of less than 0.1 kl/d over the last year.
- 727 developed stands could not be linked to a water meter. Some of these properties may have pre-paid meters, some may not be metered and at others the meter location and details may have to be verified.
- Stands for which consumption drastically increased or reduced over the last three months were also identified.

A complete meter audit should be undertaken in all towns. All illegible / broken / old meters should be replaced. Any un-metered stand identified should be metered and meter readings in the billing system should be updated where required. As part of the audit all meter boxes should also be cleaned.

The scope for further pressure management was evaluated by GLS Consulting, as part of the WC/WDM Project. Further analysis will however be required to determine the exact scope, potential cost and viability for pressure management implementation in each of the areas.

Table 9.2.2: Zones with possible pressure management potential, January 2014						
Zone	**AADD (kl/d)**	**Average Pressure (m)**	**Pressure Management Potential**	**Length of mains (km)**	**Number of stands in GIS**	**Pressure Management Possibility**
Robertson						
Reservoir 1 PRV	51	58	Existing	1.5	450	Service and commission existing PRV
Reservoir 2	1 029	43	Yes	23.3	1 790	New PRV and minimal upgrades to existing network required.
Reservoir 3	582	59	Yes	10.7	1 110	New PRV and minimal upgrades to existing network required.
Bonnievale						
New reservoir	1 273	64	Yes	22.9	1 400	Two potential new PRV zones. New PRVs and medium upgrades to existing network required.
Ashton						
Cogmanskloof	3 138	58	Yes	21.1	970	New PRV and medium upgrades to existing network required.
Conradiedorp	337	54	Yes	10.5	440	New PRV and medium upgrades to existing network required.
Zolani	857	59	Yes	18.1	1 415	New PRV and medium upgrades to existing network required.
Montagu						
South	405	58	Yes	9.5	320	New PRV and medium upgrades to existing network required.

Langeberg Municipality needs to investigate all leaks at domestic properties in poor areas with consumption above 15 kl / month. The Municipality also needs to focus on the installation of water saving devices (specific water efficient toilets) in all their municipal buildings and needs to raise awareness regarding conservation projects and the installation of these products in order to reduce the water demand and their percentage of NRW.

At least once a year, a schools education programme on water conservation should be undertaken. The Municipality should assist the school(s) with the monitoring (water audit) of their water consumption. Water saving by schools often forms the basis of WDM programmes elsewhere, because it also involves learners who experience implementation of WDM measures first hand. Schools should be encouraged to make WDM programmes part of a long term project, where learners should be actively involved.

Education and awareness-raising campaigns are important mechanisms to bring the need for WC/WDM to the public and to trigger committed public actions and response. Social awareness is one of the key pillars of WC/WDM and is essential for the balanced and sustained use of South Africa's water resources. Engagement with the public and stakeholders through media and other mediums will highlight important principles of the efficient use of water, to ensure that relevant information is shared and the public is educated and that the profile of WC/WDM is heightened to achieve buy-in, involvement and accountability from citizens.

Langeberg Municipality needs to ensure that adequate funding is allocated under their Capital and Operational budgets towards the implementation of the WC/WDM initiatives. All external funding that could be utilised by Langeberg Municipality for this purpose should be sourced.

Langeberg Municipality is committed to keep on updating the water balance models on a monthly basis in order to determine locations of wastage and to enable Langeberg Municipality to actively implement their newly developed WC/WDM Strategy to reduce losses even further. The water balance will not directly lead to the reduction of the demand, but is an imperative management tool that will inform the implementation of demand-side management initiatives.

10. WATER RESOURCES

10.1 Status Quo

Langeberg Municipality receives raw water from various sources, which include rivers, fountains, irrigation scheme canals and dams. No groundwater sources are utilised as a water source. Each of the towns in the Langeberg Municipality's Management Area are serviced by its own WTW from where the treated water is distributed to the main storage reservoirs from where it flows through the distribution systems to the consumers. The graph and table below gives a summary of the total bulk raw water supply to the various towns within Langeberg Municipality's Management Area.

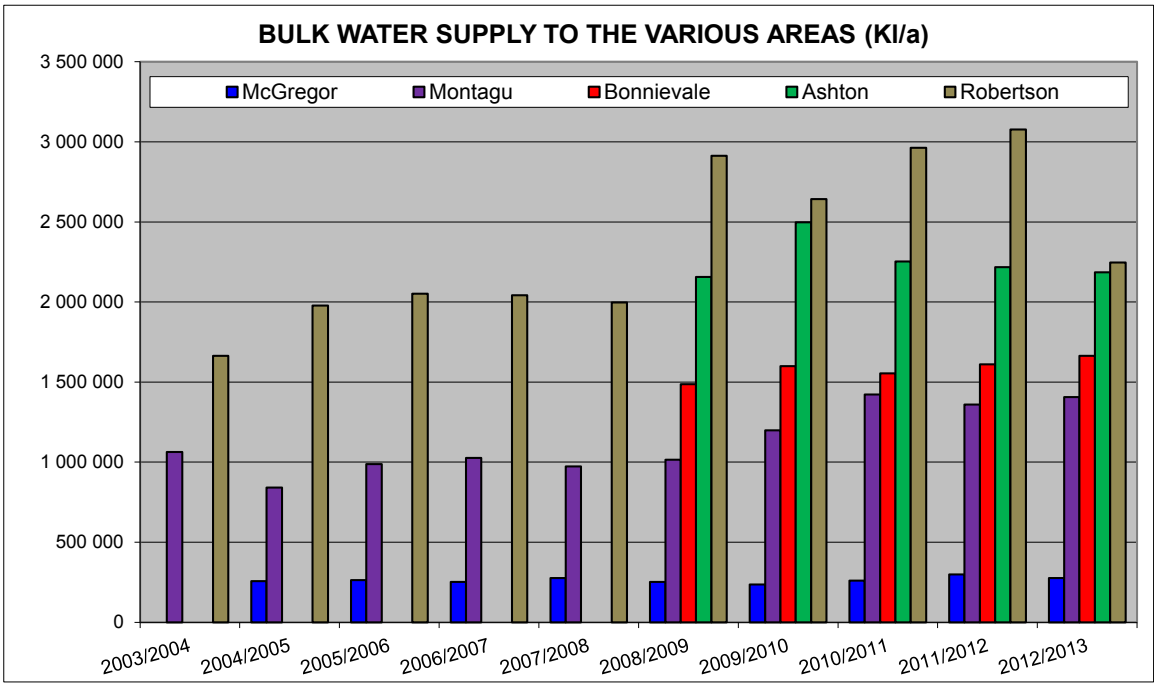

Table 10.1.1: Bulk water supply to the various distribution systems

Distribution System	Supply / Source	Sustainable Yield / Allocation	Historical Supply (Ml/a)				
			12/13	11/12	10/11	09/10	08/09
Robertson	Brandvlei Irrigation Scheme (Breede River)	1 278.750	2 246.660	3 077.968	2 962.963	2 643.497	2 913.645
	Dassieshoek and Koos Kok Dams	1 324.000					
	Hoops River Irrigation Scheme	662.000					
	Total	3 264.750					
McGregor	Houtbaais River	1 200.000	275.819	299.213	260.238	236.645	251.676
Bonnievale	Breede River and Zanddrift Irrigation Canal	1 245.000	1 664.239	1 611.535	1 554.443	1 598.823	1 486.316
Ashton	Breede River (Montagu Included)	1 500.000	2 184.689	2 217.649	2 252.403	2 498.318	2 156.946
	Cogmanskloof Irrigation Scheme (CBR)	269.690					
	Robertson Canal (Breede River)	1 192.838					
	Total	2 962.528					
Montagu	Cogmanskloof Irrigation Scheme (CBR)	665.000	1 406.205	1 358.998	1 423.146	1 198.246	1 014.468
	Rietvlei	369.000					
	Keurkloof	74.000					
	Kruis River	124.000					
	Total	1 232.000					
Total		**9 904.278**	**7 777.612**	**8 565.363**	**8 453.193**	**8 175.529**	**7 823.051**

Water Quality: Langeberg Municipality makes use of an accredited external laboratory to conduct the drinking water compliance sampling and analysis. Samples are taken at various locations in each system and analysed to evaluate the compliance. 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. The compliance percentages per individual parameter and the number of samples taken are summarised in the table below:

Table 10.1.2: Percentage compliance of the water quality samples per indicator for the period January 2013 to December 2013 (2014 DWA Blue Drop numerical limits)

Category of Determinand	Determinand	Limit	Risk	% Compliance	Number of Samples taken into account
Robertson					
Microbiological	E.Coli	0	Acute Health – 1	97.9	47
	Total Coliform Count	≤ 10	Operational	95.7	47
Chemical	Iron	≤ 300	Aesthetic	91.5	47
		≤ 2 000	Chronic Health	100.0	47
	Aluminium	≤ 300	Operational	63.8	47
Physical	Calcium	≤ 150	Aesthetic / Operational	100.0	47
	pH	5-9.7	Operational	100.0	47
	Electrical Conductivity	≤ 170	Aesthetic	100.0	47
	Magnesium	≤ 70	Aesthetic / Health	100.0	47
	Colour	≤ 20	Aesthetic	100.0	47
	Turbidity	≤ 1	Operational	12.8	47
		≤ 5	Aesthetic	93.6	47
	Free Residual Chlorine	≤ 0.5	Chronic Health	78.7	47
McGregor					
Microbiological	E.Coli	0	Acute Health – 1	100.0	45
	Total Coliform Count	≤ 10	Operational	93.3	45
Chemical	Iron	≤ 300	Aesthetic	93.3	45
		≤ 2 000	Chronic Health	100.0	45
	Aluminium	≤ 300	Operational	62.2	45
Physical	Calcium	≤ 150	Aesthetic / Operational	100.0	45
	pH	5-9.7	Operational	100.0	45
	Electrical Conductivity	≤ 170	Aesthetic	100.0	45
	Magnesium	≤ 70	Aesthetic / Health	100.0	45
	Colour	≤ 20	Aesthetic	91.1	45
	Turbidity	≤ 1	Operational	57.8	45
		≤ 5	Aesthetic	100.0	45
	Free Residual Chlorine	≤ 0.5	Chronic Health	100.0	45
Bonnievale					
Microbiological	E.Coli	0	Acute Health – 1	98.6	71
	Total Coliform Count	≤ 10	Operational	95.8	71
Chemical	Iron	≤ 300	Aesthetic	91.5	71
		≤ 2 000	Chronic Health	100.0	71
	Aluminium	≤ 300	Operational	33.8	71
Physical	Calcium	≤ 150	Aesthetic / Operational	100.0	71
	pH	5-9.7	Operational	100.0	71
	Electrical Conductivity	≤ 170	Aesthetic	100.0	71
	Magnesium	≤ 70	Aesthetic / Health	100.0	71
	Colour	≤ 20	Aesthetic	97.2	71
	Turbidity	≤ 1	Operational	40.8	71
		≤ 5	Aesthetic	95.8	71
	Free Residual Chlorine	≤ 0.5	Chronic Health	49.3	71
Ashton					
Microbiological	E.Coli	0	Acute Health – 1	93.6	47
	Total Coliform Count	≤ 10	Operational	100.0	47
Chemical	Iron	≤ 300	Aesthetic	91.5	47
		≤ 2 000	Chronic Health	100.0	47

Table 10.1.2: Percentage compliance of the water quality samples per indicator for the period January 2013 to December 2013 (2014 DWA Blue Drop numerical limits)					
Category of Determinand	**Determinand**	**Limit**	**Risk**	**% Compliance**	**Number of Samples taken into account**
	Aluminium	≤ 300	Operational	34.0	47
Physical	Calcium	≤ 150	Aesthetic / Operational	100.0	47
	pH	5-9.7	Operational	100.0	47
	Electrical Conductivity	≤ 170	Aesthetic	100.0	47
	Magnesium	≤ 70	Aesthetic / Health	100.0	47
	Colour	≤ 20	Aesthetic	100.0	47
	Turbidity	≤ 1	Operational	23.4	47
		≤ 5	Aesthetic	89.4	47
	Free Residual Chlorine	≤ 0.5	Chronic Health	74.5	47
Montagu					
Microbiological	E.Coli	0	Acute Health – 1	100.0	49
	Total Coliform Count	≤ 10	Operational	95.9	49
Chemical	Iron	≤ 300	Aesthetic	93.9	49
		≤ 2 000	Chronic Health	100.0	49
	Aluminium	≤ 300	Operational	53.1	49
Physical	Calcium	≤ 150	Aesthetic / Operational	100.0	49
	pH	5-9.7	Operational	100.0	49
	Electrical Conductivity	≤ 170	Aesthetic	100.0	49
	Magnesium	≤ 70	Aesthetic / Health	100.0	49
	Colour	≤ 20	Aesthetic	98.0	49
	Turbidity	≤ 1	Operational	65.3	49
		≤ 5	Aesthetic	100.0	49
	Free Residual Chlorine	≤ 0.5	Chronic Health	46.9	49

Effluent quality: The overall Microbiological, Chemical and Physical compliance percentages of the final effluent samples taken over the period July 2012 to June 2013, for the various WWTWs, are as follows:

Table 10.1.3: Microbiological, chemical and physical compliance percentages of the final effluent taken at the various WWTW over the period July 2012 to June 2013									
WWTW	**Micro-biological**	**Chemical**				**Physical**			
	Faecal Coliforms	**Ammonia**	**Nitrates & Nitrites**	**COD Filtered**	**Overall**	**pH**	**EC**	**SS**	**Overall**
Robertson	72.7%	0%	73%	55%	**42.4%**	100%	0%	91%	63.6%
McGregor	N/A	N/A	N/A	100%	**100.0%**	100%	100%	N/A	100.0%
Ashton	90.0%	40%	90%	100%	**76.7%**	100%	10%	100%	70.0%
Montagu	70.0%	0%	80%	10%	**30.0%**	100%	100%	100%	100.0%
Bonnievale	80.0%	100%	100%	100%	**100.0%**	100%	90%	90%	93.3%
Total	**78.0%**	**34.1%**	**85.4%**	**73.1%**	**64.9%**	**100%**	**59.6%**	**95.1%**	**84.1%**

Industrial Consumers: The volumes and nutrient loads of effluent discharged by industries in Langeberg Municipality's Management Area into the Municipality's sewer system are not yet monitored by Langeberg Municipality. The Municipality's tariff structure for the discharge of effluent by industrial consumers does not make provision for nutrient loads and volume to be taken into account. There is no limit on the permitted volume of effluent that can be discharged into the sewer system, but the concentration limits for the various parameters are included in the Municipality's Water Services by-laws (Acceptance of industrial effluent for discharge into the sewage disposal system). Langeberg Municipality's Bylaw relating to sewerage and sanitation services include the following sections w.r.t. the discharge of industrial effluent:

- Application for disposal of industrial effluent;
- Unauthorised discharge of industrial effluent;
- Quality standards for disposal of industrial effluent;

- Conditions for disposal of industrial effluent;
- Withdrawal of written permission for disposal of industrial effluent;
- Measurement of quantity of industrial effluent discharged
- Quality Standards – Acceptance of industrial effluent for discharge into the sewage disposal system

10.2 Gaps and Strategies

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. Langeberg Municipality needs to continue with the monthly reading of all the existing bulk water meters.

The Municipality is currently busy with a brief (Desktop) source augmentation study for the various towns. 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, as included in the WSDP models:

Table 10.2.1: Years in which the annual water demand is likely to exceed the total allocations from the various resources

Distribution System	Total Allocation / Yield (x 10^6 m^3/a)	Annual Growth on 2012/2013 Demand (Percentage growth)	Annual Growth on 2012/2013 Demand (Percentage growth)	WSDP Projection Model
Robertson	3.265	2024 (3%)	2019 (5%)	2023
McGregor	1.200	> 2037 (2%)	> 2037 (4%)	> 2037
Bonnievale	1.245	Over (2%)	Over (4%)	Over
Ashton	2.588	2017 (3%)	2015 (5%)	2020
Montagu	1.232	Over (3%)	Over (5%)	Over

The immediate augmentation of Bonnievale, Montagu and Ashton water sources is critical in order to meet future demands. The allocation for Bonnievale from the Zanddrift WUA canal is already exceeded, as well as the allocations and safe yields of the Montagu sources. The DWA also completed their Reconciliation Strategy during 2010/2011 and the table below gives an overview of the recommended potential future water resources as included in the Strategies.

Table 10.2.2: Potential future water resources for the various towns (DWA's Reconciliation Strategy)

Distribution System	Option	Potential
Robertson	Re-use of water	It is emphasised that water re-use must be seen as an appropriate resource for Robertson, provided that the municipality can ensure a 95% supply in terms of quality requirements. Currently, the re-use of water is not practiced in Robertson. The potential re-use option must be considered for Robertson in the long term, through one of the following potential interventions: • The installation of dual reticulation systems for any new developments, where water re-use could be considered for irrigation purposes. • Direct use for non-potable consumption, in specific for irrigation and industrial end-users. • Indirect use. • Direct use (potable consumption) should be seen as a last resort for the re-use of water.
	Groundwater	Two potential groundwater targets are present. Unfortunately the Peninsula Formation in the Langeberg to the north of Robertson is steeply folded / over folded and access to the aquifer is extremely difficult. Large fracture systems however do connect the Peninsula Formation to the Malmesbury Group basement relatively close to the Peninsula-basement contact; hence recharge overflow from the Peninsula Formation may feed into the Malmesbury Group along these fracture zones. This is evidenced by relatively high yielding Malmesbury Group boreholes (~ 4 l/s) in the region, in the vicinity of the contact with the Peninsula Formation. Boreholes targeting these structures in the Malmesbury Group could feed into the various dams in the Langeberg catchment that supply Robertson. Groundwater from the Malmesbury Group may require prior treatment however, as relatively high salinities and fluoride levels are often present. The other groundwater option for Robertson is the Quaternary alluvial aquifer associated with the Breede River. The spread of NGDB boreholes to the southeast of Robertson indicates that the alluvial aquifer is presently used in the adjacent catchments, although yields are relatively low (~ 0.5-2 l/s). Water quality may also be affected by extensive agricultural land use on the alluvial aquifer along the Breede River floodplain.

Table 10.2.2: Potential future water resources for the various towns (DWA's Reconciliation Strategy)		
Distribution System	**Option**	**Potential**
		Two 4 l/s boreholes would meet the medium scenario shortfalls for 2030 and 2035, however it is unlikely groundwater would be able to meet the high scenario shortfalls for both 2030 and 2035.
	Surface Water	Robertson usually receives the greater part of its rainfall during the winter months and it has a mean annual precipitation (MAP) of 424 mm/a. The current water supply will not meet future water requirements in the high and medium growth scenarios in the medium to long term even if the implementation of a WC/WDM Strategy is successful. The following surface water options may, therefore, be potential sources for this town: • The Breede River is one of the sources supplying Montagu with raw water. The WSDP proposes augmenting the inflow to Robertson by supplying additional water from the Breede River. Further abstraction from this river should be investigated in more detail. • Augmentation through the acquisition of additional water from the irrigation sector must be investigated. • A potential supply from the Greater Brandvlei Dam must also be investigated. The Brandvlei Dam is an off-channel storage dam, with a capacity of 342 million m^3 and fed by a canal from diversions of tributaries of the Breede River, the Smalblaar and Holsloot Rivers. The current yield of the dam is a robust 155 million m^3/a. 1.5 million m^3/a is currently allocated to the Langeberg Local Municipality. • The possibility of raising the walls of the existing Dassieshoek Dam to increase its supply yield to Robertson should be considered.
	Other Sources	The MAP is relatively low, thus rainwater harvesting should be investigated, in specific, to determine the feasibility of implementing a system like this at a municipal level.
	Summary	**The current water supply is expected to meet future water requirements in the low growth scenario but not in the medium or high growth scenarios. The following interventions should be considered and the resource options mentioned below are proposed as potential sources to augment the current water supply:** • WC/WDM strategies to reduce losses. • The re-use of water • Groundwater development • Supply from the Keurkloof River. • Raising the Dassieshoek Dam.
McGregor	Re-use of water	The volumes for re-use of water are limited, and the re-use of water is not considered financially viable in the medium to long term.
	Groundwater	Abundant groundwater resources in the form of the fractured Skurweberg Formation are present in the McGregor region. However due to the predicted future water surplus past 2035, extensive groundwater development may not be required. Farmers in Takkap, Keisers, commonly use groundwater from the upper TMG and Ceres Subgroup and Konings River Valleys in the area, as shown by the wide spread of NGDB boreholes and WARMS groundwater registrations. The Skurweberg Formation is accessible in a confined to semi-confined state to the northwest and southwest of the town, by drilling through the moderately dipping (20-30 degrees) Rietvlei Formation. Borehole yields are expected to be between 5-10l/s if the right geological structures are targeted e.g. NE-SW orientated fault and fracture ones that run either side of the town, as evidenced by relatively high yielding NGDB boreholes (~ 9 l/s) in the Takkap River Valley.
	Surface Water	McGregor normally receives most of its rainfall during winter with a mean annual precipitation (MAP) of 406 mm/a. The current water supply will meet the future water requirements, even for the high growth scenario. However there are a number of rivers in the area that may be potential surface water options for this town beyond this water balance projection. The following rivers will require further investigation for potential abstraction, namely: • Keisers River • Konings River • Vink River There is also the Klipberg Dam located 3.8 km west of McGregor. There is no information available of the current yield of this dam, its current allocation or end-users.
	Other Sources	The MAP is relatively low, and rainwater harvesting should be investigated further, specifically to determine the viability on implanting such a system on a Municipal level.
	Summary	**The current water supply will meet the future water requirements, even for the high growth scenario. The following interventions should be considered for implementation, and the following resource options are proposed as potential sources to augment the current water supply beyond 2035 or if required at an early stage:** • WC/WDM strategies to reduce losses.

Table 10.2.2: Potential future water resources for the various towns (DWA's Reconciliation Strategy)		
Distribution System	**Option**	**Potential**
		• Groundwater development. • Diversion or abstraction from the various small rivers in close proximity of the town. • Rainwater harvesting.
Bonnievale	Re-use of water	Currently, effluent is re-used for crop irrigation in the Bonnievale area. Re-use of water for domestic consumption, whether this is by direct or indirect use is not an option at this stage, considering the current treatment process at the Bonnievale WWTW.
	Groundwater	The only aquifer unit relatively close to Bonnievale is the Quaternary Alluvium associated with the Breede River. Yields may be in the range of 2-5 l/s, although water quality may be reduced (Class 1-2) due to increased salinity levels from extensive irrigation in the lower to middle courses of the Breede River Valley. The only other groundwater option is the thin sandstone units of the Blinkberg Formation (Witteberg Group) ~ 6 km north and northwest of Bonnievale. Yields are unlikely to be higher than 2 l/s however, and water quality is expected to be relatively poor (Class 2-3). A pipeline would have to be constructed along Voortrekker Road to transport the water to Bonnievale, if this aquifer is targeted. There are currently no NGDB or WARMS registered boreholes in the near vicinity of Bonnievale, indicating the generally poor groundwater resources present. A series of boreholes in the Breede River Quaternary alluvium may assist in reducing future water shortfalls at Bonnievale (four 5 l/s or eight 2.5 l/s boreholes would meet the 2035 high scenario shortfall), although it is likely the water would have to be treated prior to use.
	Surface Water	Bonnievale usually receives most of its rainfall during the winter months and has a mean annual precipitation (MAP) of 389 mm/a. The current water supply will meet the future water requirements in the low and medium growth scenarios but not in the high growth scenario. If the high growth scenario becomes a reality, the following surface water options may be potential water sources for Bonnievale: • Additional water rights from the Zanddrift Irrigation canal should be investigated. • Some natural freshening takes place downstream of the canal off-take, where the Riviersonderend and Buffeljags River tributaries enter the Breede River. This is because the water from these tributaries is of better quality than the water in the middle Breede River itself. The Riviersonderend River lies 16 km south of Bonnievale. A possible augmentation of the water supply to Bonnievale could be achieved by pumping water from the Riviersonderend River but this will require further investigation. • Investigate further abstraction from the Breede River.
	Other Sources	The MAP is relatively low and rainwater harvesting should be further investigated, in specific, to determine the feasibility of implementing a system like this on a municipal level.
	Summary	**The current water supply will meet future water requirements in the low and medium growth scenarios but not in the high growth scenario. The following potential resource interventions should be considered to augment the current water supply:** • WC/WDM strategies to reduce losses. • Re-use of water. • Rainwater harvesting. • Additional water rights from the Zanddrift Irrigation canal • Abstract water from the Riviersonderend River.
Ashton	Re-use of water	It is highlighted that water re-use must be seen as a suitable resource for Ashton, provided that the Municipality can provide a 95% assurance of supply in terms quality requirements. Currently, the re-use of water is not practiced in Ashton. The re-use of water from the WWTW is a practical option, considering the acceptability of the existing process technology and the volumes of effluent that is available. The potential reuse option must be considered for Ashton in the long term, possibly through one of the following interventions: • One option is dual reticulation systems for new developments, where re-use of water could be considered for irrigation purposes. • The direct use for non-potable consumption, namely for irrigation and industrial end-users specifically. • The option of indirect use. • The option of direct use (potable consumption) should be seen as a last resort for the re-use of water.
	Groundwater	The main groundwater targets for Ashton include the Peninsula and Skurweberg Formations (in unconfined to semi-confined states) of the TMG in the Kogmanskloof Pass, and the Quaternary alluvium along the Kogmanskloof River. The fractured aquifers of the Peninsula and Skurweberg Formations are currently underutilised in the Langeberg region, due to accessibility issues and the

Table 10.2.2: Potential future water resources for the various towns (DWA's Reconciliation Strategy)		
Distribution System	**Option**	**Potential**
		fact that the majority of towns have sufficient surface water resources at present. Future shortfalls could be met by targeting the Peninsula Formation in the Kogmanskloof Pass, where high yields between 10-20 l/s with good quality water (Class 0-1) can be expected if the right geological structures are targeted. Due to the high bedding dips of the aquifer units in the pass (60 degrees to near vertical), they can only be targeted in the unconfined to semi-confined states. Abstracted groundwater could be pumped into the Kogmanskloof River and transported to Ashton. Three 10-20 l/s TMG boreholes would meet all future shortfall scenarios, except the 2035 high scenario. The possible future use of the same TMG groundwater resource by Montagu needs to be taken into account however. The Quaternary alluvial aquifer along the Kogmanskloof River just south of Ashton could be targeted for farm irrigation, with borehole yields likely to be in the range of 2-5 l/s. Two WARMS registered boreholes in the alluvium just to the south of Ashton have a combined yield of 0.23 million m^3/a (~ 7 l/s over 24 hours). Poorer water quality (Class 1-2) in comparison to TMG groundwater may be present however, as a result of fertilizer and wastewater release from agricultural activities along the river's floodplain.
	Surface Water	Ashton normally receives most of its rainfall during winter with a mean annual precipitation (MAP) of 441 mm/a. The current water supply will meet the future water requirements for the three growth scenarios if the implementation of a WC/WDM Strategy is successful. If this is not the case, there will be shortfalls for the medium and high growth scenarios. Should the latter medium or high growth scenario be realised, the following surface water options may be potential sources for this town: • Augmentation by acquiring additional water from the Kogmanskloof irrigation scheme must be further investigated. • Investigate further abstraction from the Breede River.
	Other Sources	The MAP is relatively low, and rainwater harvesting should be investigated further, specifically to determine the viability on implanting such a system on a Municipal level.
	Summary	**The current water supply will meet the future water requirements for the three growth scenarios if the implementation of a WC/WDM Strategy is successful. If this is not the case, there will be shortfalls for the medium and high growth scenarios. The following interventions should be considered for implementation, and the following resource options are proposed as potential sources to augment the current water:** • WC/WDM strategies to reduce losses. • Re-use of water. • Investigate additional supply from the Kogmanskloof irrigation. • Additional supply from the Breede River. • Groundwater development of the TMG Aquifer.
Montagu	Re-use of water	To date, the potential reuse of treated effluent appears most favourable at the Montagu Golf Course redevelopment and where farmers have been contracted to use treated effluent for irrigation purposes. The potential re-use option must be considered for Montagu in the long term, possibly through one of the following interventions: • The installation of dual reticulation systems for any new developments, where the re-use of water can be considered for irrigation purposes. • Direct use for non-potable consumption, namely for irrigation and industrial end-users specifically. • Indirect use. • Direct use (potable consumption) should be seen as a last resort for the re-use of water.
	Groundwater	The main groundwater targets for Montagu include the Peninsula and Skurweberg Formations (in unconfined to semi-confined states) of the TMG in the Kogmanskloof Pass, as well as the Skurweberg Formation in the Badskloof region of Montagu West. The fractured aquifers of the Peninsula and Skurweberg Formations are currently underutilised in the Langeberg region, due to accessibility issues and the fact that the majority of towns have sufficient surface water resources at present. There are no predicted future shortfalls for Montagu, although these two aquifers could be targeted if extra water is required. High yields between 10-20 l/s with good quality water (Class 0-1) in the Peninsula Formation in Kogmanskloof Pass can be expected, if the right geological structures are targeted. Yields of between 5-10 l/s and similar water quality can be expected within the Skurweberg Formation at both Kogmanskloof Pass and Badskloof, once again provided the right geological structures are targeted. Two NGDB registered boreholes (one with a yield of ~ 4 l/s) are present in the upper TMG (probably Rietvlei Formation) in Badskloof, and are likely to be the boreholes mentioned in the 2009 WMP. Due to the high bedding dips of the aquifer units in the pass and at Badskloof (60 degrees to near vertical), they can only be targeted in the unconfined to semi-confined states. Abstracted groundwater from the pass could be pumped into the irrigation pipeline between Ashton

Table 10.2.2: Potential future water resources for the various towns (DWA's Reconciliation Strategy)		
Distribution System	**Option**	**Potential**
		and Montagu, whereas water from Badskloof could be pumped straight into the Montagu WWTW as it was previously. Due to the predicted surplus at Montagu groundwater should only be used if urgently required, as Ashton (which is predicted to have shortfalls) will possibly make use of the shared groundwater resource in the future. The Breede River Basin study (DWA, 2003) states that the Bokkeveld Group is the main aquifer for the Montagu sub-region, with 35% of boreholes having yields greater than 5 l/s (but with a poor groundwater quality). The Bokkeveld Group can be used for smaller farm irrigation projects if required (long term sustainable yields are likely to be <5 l/s, even if the more sandstone rich units are targeted), however for larger scale own groundwater developments focus should fall on the Peninsula and Skurweberg Formations.
	Surface Water	Montagu normally receives the greater part of its rainfall during the winter months and the mean annual precipitation (MAP) is 374 mm/a. The current water supply will meet future water requirements, even in the high growth scenario. However, there are a number of potential surface water options for this town over and above the water balance projection. The following surface water interventions are proposed beyond the year 2035 projection horizon, or earlier if required: • Acquiring additional rights from the CBR scheme and additional abstraction from the Breede River via Ashton. • The potential for abstraction from the Keisie and Kingna Rivers must be investigated.
	Other Sources	The MAP is relatively low, and rainwater harvesting should be investigated, in specific, to determine the feasibility of implementing a system like this on a municipal level.
	Summary	**The current water supply will meet future water requirements, even in the high growth scenario. The following potential interventions to augment the current water supply beyond 2035 (or earlier if required) should be considered as well as the potential source options listed below:** • WC/WDM strategies to reduce losses. • Groundwater development • Abstraction from the Keisie and Kingna Rivers. • Additional abstraction from the Breede River via Ashton. • Re-use of Water

Industrial Consumers: The industrial consumers in Langeberg Municipality's Management Area are not yet monitored, with regard to the quality and volume of effluent discharged by them. The following gaps with regard to industrial consumers and their discharge of effluent into Langeberg Municipality's sewer system were identified:

- Industrial effluent discharge into the sewer system needs to be quantified (Volume and quality).
- All industrial consumers need to formally apply for the discharge of industrial effluent into the sewer system.
- Regular sampling of the quality of industrial effluent discharged into the sewer system is necessary and the industrial consumers need to receive monthly accounts according to the quality of effluent discharged by them.
- Any returns from the industries direct to the Water Resource System needs to be metered.

Langeberg Municipality is committed to ensure that all industries apply for the discharge of industrial effluent into the sewer system, to monitor the quality and volume of industrial effluent discharged and to implement the set of by-laws with regard to the discharge of industrial effluent into Langeberg Municipality's sewer system in order to determine whether the quality comply with the standards and criteria. The industrial consumers will also be billed according to the quality of effluent discharged by them.

Langeberg Municipality needs to adopt an approach whereby the various parameters at all the industrial consumers are monitored, as well as volumetric monitoring at the larger users. Adaptation of 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.

All current industrial consumers need to apply for discharge permits and they must supply and maintain a flow meter measuring the volume of water that is discharged into Langeberg Municipality's sewerage system. 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.

11. FINANCIAL

11.1 Status Quo

Capital Budget: Langeberg Municipality's proposed Water and Sewerage Capital Budget for 2014/2015 is R18.8 million and R4.8 million respectively. The updated Water and Sewer Master Plans (March 2012) recommends upgrades to the values indicated in the table below in the foreseeable future in order to accommodate development and population growth according to the SDF (2011 Values, which include P&Gs, Contingencies and Fees, but exclude EIA studies, registration of servitudes and / or land acquisition and VAT).

Table 11.1.1: Future Water and Sewerage Infrastructure required

System	Water Infrastructure				Sewerage Infrastructure		
	Reticulation	Reservoirs and Pump Stations	WDM	Total	Reticulation	Pump Stations	Total
Robertson	R11 536 000	R21 638 400	R500 000	R33 674 400	R4 393 100	R223 000	R4 616 100
McGregor	R2 562 000	R575 400	R100 000	R3 237 400	R7 907 400	R342 200	R8 249 600
Bonnievale	R4 674 600	R19 153 400	R200 000	R24 028 000	R16 245 700	R2 157 100	R18 402 800
Ashton	R6 539 400	R24 105 200	R300 000	R30 944 600	R8 831 200	R590 500	R9 421 700
Montagu	R7 032 200	R21 074 200	R500 000	R28 606 400	R9 610 100	R837 500	R10 447 600
Totals	**R32 344 200**	**R86 546 600**	**R1 600 000**	**R120 490 800**	**R46 987 500**	**R4 150 300**	**R51 137 800**

The previous table is for the internal systems and exclude the bulk infrastructure needs (Augmentation of Water Sources, Bulk Pipelines and the upgrading of WTWs and WWTWs).

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

Table 11.1.2: Summary of water and sanitation operational budgets

Service	Expenditure / Income	Actual 12/13	Actual 11/12	Actual 10/11
Water	Expenditure	R30 881 455-09	R29 637 534-29	R25 079 138-52
	Income	-R36 278 716-84	-R31 090 183-54	-R34 921 909-43
	- Surplus / Deficit	**-R5 397 261-75**	**-R1 452 649-25**	**-R9 842 770-91**
Sanitation	Expenditure	R16 535 754-62	R16 476 588-80	R16 554 540-05
	Income	-R35 362 358-77	-R17 590 235-61	-R11 778 973-53
	- Surplus / Deficit	**-R18 826 604-15**	**-R1 113 646-81**	**R4 775 566-52**
Water and Sanitation	**- Surplus / Deficit**	**-R24 223 865-90**	**-R2 566 296-06**	**-R5 067 204-39**

Tariff and Charges: The first six (6) kl of water is provided free to all consumers. Langeberg Municipality'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 Langeberg Municipality's Indigent Policy and all indigent households therefore receive free basic water and sanitation services, which is funded from the equitable share.

A rising block step tariff system is not yet implemented by Langeberg Municipality and the current tariff system does not discourage the wasteful or inefficient use of water. The Municipality is currently busy with a study to review their tariff system, in order to implement a step block rising tariff structure in the future. The sustainable supply of potable water is becoming an ever increasing challenge. This scarce commodity has to be optimally managed. The continued increase in the price of electricity and chemicals for purification has contributed to the cost of delivering the service. The water usage block tariff should be structured for a basic affordable tariff for up to 20-30 kl per household per month, with punitive tariffs for excessive water consumption.

11.2 Gaps and Strategies

Capital Budget: The water supply systems in most of the Municipalities are under increasing threat of widespread failure, due to inadequate rehabilitation and maintenance of the networks. This is also the case in Langeberg Municipality's Management Area with 42.45% of the water infrastructure and 51.75% of the sewerage infrastructure which has been consumed. This is placing considerable strain on Langeberg Municipality's maintenance operations. The real solution is for the Municipality to continue with their current commitment towards a substantial and sustained programme of capital renewal works (Rehabilitation and Maintenance of the existing infrastructure).

The replacement value of the water infrastructure that is expected to come to the end of its useful life over the next 20 years is around R21.8 million (an average of R1.1 million per year) and for sewerage infrastructure the value is R176 million (an average of R8.8 million per year). Not all the water networks are however included in the asset register. The renewals burden is set to continue to increase sharply over the next 15 years, as is currently the case. Water and sewerage infrastructure assets with a total current replacement value of about R9.2 million and R82.6 million will be reaching the end of their useful life over the next 10 years and will need to be replaced, rehabilitated or reconstructed.

It is therefore important for the Council to continue with their current committed capital renewal programme and to increase the budgets allocated towards the maintenance and rehabilitation of the existing infrastructure. The extent to which each type of water and sewerage infrastructure asset has been consumed was previously summarised. The Municipality's dedicated renewal programmes need to target the poor and very poor assets. If this is not done, there is a risk that the ongoing deterioration will escalate to uncontrollable proportions, with considerable impact on customers, the economy of the area and the image of Langeberg Municipality.

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

- To focus strongly on revenue collection, because most of the funds for the water and sewerage capital projects are form Langeberg Municipality's own funding sources. Actively implement the Credit Control and Debt Collection Policy in order to minimize the percentage of non-payment of municipal services.

- To identify all possible sources of external funding over the next number of years to assist Langeberg Municipality to address the bulk infrastructure backlogs that exist in the various towns and to ensure adequate rehabilitation and maintenance of the existing infrastructure. The Municipality will not embark on new External Funding to fund large infrastructure projects.

- Develop IAMPs for all water and sewerage infrastructure, which will indicate the real replacement values, the service life of the assets and the funds required to provide for adequate asset replacement.

- Langeberg Municipality can also start with the investigation of alternative ways of providing the services. Business Process Re-engineering reviews can be undertaken to identify both more efficient and cost-effective ways of delivering services.

The financial strategies currently in place for Langeberg Municipality, as included in the Municipality's 2014/2015 IDP, are as follows:

Table 11.2.1: Financial Strategies of Langeberg Municipality

Strategy	Purpose
Revenue Raising Strategies	• Extension of the Pre-paid electricity meters programme. • To bring pre-payment meter vending points within close proximity of all consumers. • To ensure optimal billing for services rendered and cash collection. • To ensure effective credit control and debt collection. • In the structuring of tariffs, continue with the user-pay principle and full cost recovery. • Re-evaluation of all properties as per the Municipal Property Rates Act, at market-related values. Outsourcing of pay-point facilities.
Asset Management Strategies	• Completed process of unbundling all infrastructure assets and compiling a new improved asset register. • Conducting audits on all moveable assets of the organisation.

Table 11.2.1: Financial Strategies of Langeberg Municipality	
Strategy	**Purpose**
	• To improve the over-all management of fixed property.
Financial Management Strategies	• Continued cash flow management. • Outsourcing of pay-point facilities.
Capital Financing Strategies	• Continued use of Own Capital (CRR). • Assessing national and provincial funding through proper requests, business plans and motivations.
Operational Financing Strategies	• To introduce free basic services within the limits of affordability. • Implementation of proper tariff structures for all the services. • "Economic" and "Trading Services" being cost reflective.
Strategies that would enhance cost-effectiveness	• Investigation into possibilities for utilising new technology to save costs. • Implementation of new systems / equipment acquired to address capacity shortages.

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. A maintenance management system needs to be developed, which will enable Langeberg Municipality to better manage its risks, and more effectively plan and prioritise the wave of renewals that are going to be required over the next twenty 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.

Langeberg Municipality'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 need to form part of the operating budget and subsequent tariffs, linked to a ring-fenced asset replacement fund.

- Water services operational surpluses have to be allocated to essential water services requirements.

Tariff and Charges: The table below gives an overview of the water tariffs of Langeberg Municipality (Vat Excluded), with some comments on possible step blocks.

Table 11.2.2: Comments on Langeberg Municipality's water tariff system				
Block (Kl / month)	**12/13**	**11/12**	**10/11**	**Comments**
0 - 6	R0-00	R0-00	R0-00	Free Basic Water
7 - 20	R3-89	R3-60	R3-40	Low volume use
21 - 30				Typical use volume, including garden irrigation
31 - 60				Above average use, including garden irrigation
61 - 100				Wasteful use and / or severe garden irrigation
> 100				Significant waste and / or unnecessary garden irrigation

Langeberg Municipality will change their current water tariff system to an increased step block tariff system. A step block tariff system will discourage wasteful or inefficient use of water. Langeberg Municipality can also investigate the possibility of linking their sewerage tariffs to the water usage (Volumetric sewerage tariffs). The quantity of wastewater discharged by the industrial consumers into Langeberg Municipality's sewer system also needs to be metered and the quality needs to be monitored regularly by Langeberg Municipality.

It is suggested that Langeberg Municipality implement the following tariff structure characteristics, in order to ensure the efficient use of water.

- Implement 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 or high water use.

- The volumetric steps should be kept the same for all the areas within Langeberg Municipality'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.

The tariff codes of Langeberg Municipality need to adequately differentiate between residential, commercial and industrial users. These codes can be further reviewed so that distinction can also be made between user types for Municipal Usage (e.g. parks, sports, fire fighting, etc.). A code should also be used to uniquely describe the water usage by schools.

12. WATER SERVICES INSTITUTIONAL ARRANGEMENTS

12.1 Status Quo

Langeberg Municipality acts as both WSA and WSP to the consumers in their Municipal Management Area and therefore does not manage other WSPs. A comprehensive set of Water Services By-laws and By-law relating to Sewerage and Sanitation Services are in place for Langeberg Municipality's Management Area. The By-laws cover the provision of services for water supply, sanitation and industrial effluent.

The IDP is the Municipality's single most strategic document that drives and directs all implementation and related processes. The Municipality's budget is developed based on the priorities, programmes and projects of the IDP, after which a Service Delivery Budget Implementation Plan (SDBIP) is developed, to ensure that the organisation actually delivers on the IDP targets.

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 the Process Controllers and Supervisors at the various plants. A skills 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 2013/2014 is in place.

12.2 Gaps and Strategies

Langeberg Municipality 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 continue to report annually and in a public way on progress in implementing the plan (Water Services Audit), as part of Langeberg Municipality's Annual Report.

It is important for Langeberg Municipality to report annually on the KPIs as listed in the SFWS, included in DWA's Water Services Regulation Strategy and required by DWA's RPMS. The RPMS is one of the programmes under DWA's Directorate Water Services Regulation. The DWA is changing the manner in which they regulate WSAs by becoming more proactive in their processes. A new risk- and incentive based process will be followed, which will focus on the four strategic areas of financially viable business, Customer Satisfaction, Effective Institution and Technical Efficiency.

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 Langeberg Municipality to compile a Legal Compliance Audit of the WTWs and WWTWs in Langeberg Municipality's Management Area, which will provide the management of Langeberg Municipality with the necessary information to establish whether the Municipality is in compliance with the legislation or not.

It is important for Langeberg Municipality to allocate adequate funding for the rehabilitation and maintenance of the existing infrastructure and all forward planning for new infrastructure should be guided by the Water and Sewer Master Plans.

Langeberg Municipality will continue with their mentoring role for operational personnel ensuring an adequately trained and classified workforce with dedicated training programmes for supervisors and operational personnel. Budgets need to be established to address the shortfall of skilled personnel, 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 operational personnel, technicians and managers will be established.

The training of Langeberg Municipality's personnel involved in the management of water and sanitation services is the most important factor that determines the ability of Langeberg Municipality to deliver safe and reliable water and to treat the effluent at the WWTWs to an acceptable standard. Training of all staff involved in water supply and sanitation 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 and the environment.

Langeberg Municipality can also continue to actively focus on in-house training, which requires the identification of trainers (from senior operators / officers / professional ranks) for the development and facilitation of courses which relate to specific organizational knowledge and systems requirements. Langeberg Municipality's internal reports such as the Water Safety Plan, Wastewater Risk Abatement Plan, Operation and Maintenance Manuals and this WSDP have the necessary information on which the in-house courses can be based. This will assist Langeberg Municipality's Human Resource Department in general and the skills development facilitator in particular to develop and implement effective workplace skills plans relevant to Human Capacity Development requirements.

13.SOCIAL AND CUSTOMER SERVICE REQUIREMENTS

13.1 Status Quo

A comprehensive Customer Services and Complaints system is in place at Langeberg Municipality and the Municipality has maintained a high and a very consistent level of service to its urban water consumers. After hour emergency requests are being dealt with by the control room on a twenty four hour basis. All water and sanitation related complaints are logged through the system in order to ensure quick response to complaints.

The tables below gives an overview of the water and sanitation areas monitored by Langeberg Municipality with regard to customer services and the percentage of queries / complaints addressed within the specified time period.

Table 13.1.1: Water and sanitation indicators monitored by Langeberg Municipality with regard to customer services and maintenance work, as captured in the monthly reports

Definition	2012/2013						2011/2012					
	Robertson	Ashton	Montagu	Bonnievale	McGregor	Total	Robertson	Ashton	Montagu	Bonnievale	McGregor	Total
Water quality complaints	2	23	10	0	0	**35**	7	14	7	0	0	**28**
New water connections	37	36	15	18	4	**110**	48	59	26	13	3	**149**
Breakages on networks	87	99	68	81	3	**338**	85	126	44	110	9	**374**
Water meters put on drip	89	0	0	0	0	**89**	32	0	0	0	0	**32**
Water meters drip removed	15	0	0	0	2	**17**	24	0	0	1	0	**25**
Sewer complaints	n/a	n/a	n/a	n/a	n/a	**n/a**	0	0	47	0	0	**47**
New sewer connections	15	1	7	1	1	**25**	42	7	5	2	1	**57**
Sewer Blockages	738	602	294	280	46	**1 960**	934	674	333	443	56	**2 240**
Toilets repaired	22	2	2	4	0	**30**	59	0	10	3	0	**72**
Manhole covers replaced	0	9	3	4	1	**17**	15	2	12	4	1	**34**
Sewerage truck (Trips)	773	619	39	1314	2 027	**4 772**	602	414	73	1372	1 945	**4 406**

Table 13.1.2: Water and sanitation indicators monitored by Langeberg Municipality with regard to customer services

Description	Langeberg LM		Robertson		Ashton		Montagu		Bonnievale		McGregor		Farms		Total	
	C	UC	C	UC	C	UC	C	UC	C	UC	C	UC	C	UC	Complete	Incomplete
Unsatisfied Services	21	5	0	0	0	0	0	0	0	0	0	0	0	0	**21**	**5**
Consumer Damages	0	0	98	5	108	4	28	1	29	0	1	0	0	0	**264**	**10**
Leiwater & Channels	0	0	150	12	0	0	5	2	3	3	4	4	0	0	**162**	**21**
Municipal Water Pipes	0	0	115	13	90	23	36	10	67	41	1	1	0	0	**309**	**88**
No Water Supply	0	0	60	5	73	15	47	7	17	12	1	0	8	3	**206**	**42**
Pipe Bursts	0	0	53	13	81	28	42	9	60	51	0	2	10	2	**246**	**105**
Pump Stations Civil / Electrical	0	0	24	1	16	6	22	1	23	7	7	1	0	0	**92**	**16**
Quality Of Water	0	0	12	0	19	9	6	2	7	3	1	1	0	0	**45**	**15**
Stop Cocks	0	0	75	2	62	22	36	7	22	5	0	0	0	0	**195**	**36**

Table 13.1.2: Water and sanitation indicators monitored by Langeberg Municipality with regard to customer services																
Description	**Langeberg LM**		**Robertson**		**Ashton**		**Montagu**		**Bonnievale**		**McGregor**		**Farms**		**Total**	
	C	**UC**	**C**	**UC**	**C**	**UC**	**C**	**UC**	**C**	**UC**	**C**	**UC**	**C**	**UC**	**Complete**	**Incomplete**
Water Blockages / Drip	0	0	14	0	0	0	0	0	0	0	0	0	0	0	**14**	**0**
Water Connections	0	0	4	0	8	4	1	1	3	8	0	1	0	0	**16**	**14**
Water Meters	0	0	0	0	0	0	0	0	0	0	0	0	5	1	**5**	**1**
Water Meters: Bulk	0	0	0	0	0	0	4	2	0	0	0	0	0	0	**4**	**2**
Water Meters: Damaged	0	0	35	5	22	7	15	1	13	13	0	0	0	0	**85**	**26**
Water Meters: Dirty	0	0	1	0	2	0	48	1	69	96	0	0	0	0	**120**	**97**
Water Meters: Leakages	0	0	343	14	96	29	117	20	86	25	1	2	0	0	**643**	**90**
Water Meters: Move	0	0	11	1	3	3	0	0	6	11	0	0	0	0	**20**	**15**
Water Meters: Not Found	0	0	1	0	15	0	0	0	0	0	0	0	0	0	**16**	**0**
Water Meters: Not on System	0	0	0	0	1	2	1	1	0	0	0	0	0	0	**2**	**3**
Water Meters: Pre Paid	0	0	0	0	23	11	0	0	0	0	0	0	0	0	**23**	**11**
Water Meters: Reading	0	0	5	0	25	5	39	6	7	2	0	1	0	0	**76**	**14**
Water Meters: Standing	0	0	3	0	5	3	60	16	9	9	0	0	0	0	**77**	**28**
Water Pressure	0	0	21	1	28	12	11	2	6	3	1	0	0	0	**67**	**18**
Water: Estimates	0	0	0	0	1	0	0	0	2	0	0	0	0	0	**3**	**0**
Water: Sundry	0	0	0	0	1	0	1	0	0	0	0	0	0	0	**2**	**0**
Manholes	0	0	18	1	5	4	3	3	3	0	0	0	0	0	**29**	**8**
Septic Tanks	0	0	10	1	61	19	23	2	365	42	16	4	0	0	**475**	**68**
Sewerage Blockages	0	0	995	82	349	75	354	52	214	107	3	3	3	4	**1 918**	**323**
Sewerage Connections	0	0	7	0	7	1	2	1	6	5	0	1	0	0	**22**	**8**
Sewerage: Sundry	0	0	22	1	22	0	7	0	0	0	0	0	0	0	**51**	**1**
Total	**21**	**5**	**2 077**	**157**	**1 123**	**282**	**908**	**147**	**1 017**	**443**	**36**	**21**	**26**	**10**	**5 208**	**1 065**

13.2 Gaps and Strategies

Access to safe drinking water is essential to health and is human right. Safe drinking water that complies with the SANS:241 Drinking Water specifications do not pose a significant risk to health over a lifetime of consumption, including different sensitivities that may occur between life stages. Langeberg Municipality is therefore committed to ensure that their water quality always complies with national safety standards.

The Water Safety Plan of Langeberg Municipality includes an Improvement / Upgrade Plan. The purpose of the Improvement / Upgrade Plan is to address the existing significant risks where the existing controls were not effective or absent. Barriers implemented by Langeberg Municipality against contamination and deteriorating water quality include the following:

- Participate in Catchment management and water source protection initiatives.
- Protection at points of abstraction such as river intakes and dams (Abstraction Management).
- Correct operation and maintenance of WTWs (Coagulation, flocculation, sedimentation and filtration).
- Protection and maintenance of the distribution systems. 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 implemented by Langeberg Municipality against poor quality drinking water that are a prerequisite to those listed above are as follows:

- 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 have respect for water as a precious resource.

14. NEEDS DEVELOPMENT PLAN

14.1 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 department. 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. The existing Water and Sewer Master Plans of Langeberg Municipality were last updated during March 2012. 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

The needs identified through the WSDP process, which needs to be addressed in the future, are summarised in the table below for the different Topics:

Table 14.1.1: Needs identified through the WSDP process and possible improvements / projects

Topic	Short Coming	Possible Improvements / Projects
Administration	Key issues raised in the WSDP need to be taken to the IDP.	Ensure Executive Summary of WSDP is included in the IDP.
Demographics	-	-
Service Levels	Ensure that all households on the farms in the rural areas with existing services below RDP standard are provided with at least basic water and sanitation services	Assist private landowners as far as possible with the provision of basic water and sanitation services to all the households in the Municipality's Management Area with existing service levels below RDP standard.
	Ensure that all households in informal areas are provided with at least basic communal water and sanitation services.	Provide communal basic water and sanitation services in informal areas where it is found viable to provide the services.
Socio Economic	Various socio economic needs	Adequately covered through the Municipality's Policies, LED Strategy, SDF and Social Programmes.
Water Services Infrastructure	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.
	Ensure that an appropriate maintenance and rehabilitation plan (IAMP) is developed and implemented.	Develop an Infrastructure Asset Management Plan (IAMP) from the updated Asset Register. 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.
	Existing problems at the WTWs and WWTWs, interim solutions for improving operations and refurbishment and upgrade requirements were identified for each of the WTWs and WWTWs as part of the detail Annual Process Audits.	Implement the recommendations from the detail WTW and WWTW Process Audits. Ensure adequate budget is allocated for the future upgrading and refurbishment work.
	Ensure adequate storage capacity for the various towns.	Provide additional storage capacity to the towns with inadequate storage capacity, as identified through the WSDP and Water Master Plans.
	The Water and Sewer Master Plans identified and prioritised the future infrastructure requirements for the various towns.	Continue with the implementation of the water and sewer projects prioritised in the Water and Sewer Master Plans.
	Records need to be kept of the number of breakages / failures per infrastructure type in order to assist the Municipality with their refurbishment and maintenance planning.	Keep record of all breakages / failures per infrastructure type.
	The O&M budget allocated to repairs and maintenance seems a bit low and additional budget should be allocated to address amongst other tasks the replacement of malfunctioning and old consumers meters, clearing of meter boxes, buying replacement mechanisms for bulk meters, speedy repair of leaks, leak detection in areas with higher than expected night flows, etc. It is important for Langeberg Municipality to differentiate between budget allocated towards the operation and maintenance of the water infrastructure and budget	Increase O&M budget for repairs and maintenance of infrastructure. A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of existing infrastructure. In the case of operations and maintenance of the system, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the system remains in good condition.

Table 14.1.1: Needs identified through the WSDP process and possible improvements / projects		
Topic	**Short Coming**	**Possible Improvements / Projects**
	for the replacement of infrastructure.	
	Ensure that all the assets, as listed under the various tables in this chapter, are included in the Asset Register. The total replacement value of the water infrastructure in the asset register is too low. Not all the water reticulation networks are included in the asset register.	The water infrastructure in the asset register should be checked to ensure that all network items are listed and that items are correctly priced. The total replacement value in the asset register should be reviewed. Update the Asset Register to include all the assets.
Operation and Maintenance	It is important for Langeberg Municipality to classify all treatment works and operators along the lines of the regulations by establishing a programme for certification of works, operators, technicians and managers. The process will include reviewing the skills needed and aligning resources to these needs as well as reviewing total staff numbers necessary to meet all the objectives in the National Water Act.	Establish a mentoring role for operators ensuring an adequately trained and classified workforce with dedicated training programmes for supervisors and operators. Establish budgets 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.
	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 Langeberg Municipality to compile a Legal Compliance Audit of their WTWs and WWTWs, which will provide the management of Langeberg Municipality with the necessary information to establish whether the Municipality is in compliance with the legislation or not.	Compile an Occupational Health and Safety Audit at all the WTWs and WWTWs.
	Comprehensive Operational and Maintenance Manuals were drafted for all the WTWs and WWTWs during 2013/2014. The O&M Manuals were written as a guide for the Process Controllers for the operation of the plants and deals with day-to-day activities required in the operation of the treatment process. It also lists the checks to be carried out by the Process Controllers on the mechanical and electrical equipment.	Ensure the Process Controllers use and implement the newly developed O&M Manuals.
	The Municipality's existing Water Quality Operational Sampling Programme needs to comply with the minimum SANS241:2011 monitoring frequency for process indicators.	The following additional operational water quality sampling needs to be done by Langeberg Municipality: • Electrical Conductivity of the raw water and the final water at all the WTW on a daily basis. • Turbidity of the raw water on a daily basis and the final water at the McGregor WTW once per shift. • pH, Turbidity and disinfectant residuals at the sampling points in the distribution networks fortnightly. Monthly microbiological compliance samples also need to be taken at an additional three sample sites in Robertson.
	All incidents at WTWs and WWTWs and on the networks need to be recorded and the specific Incident Management Protocols need to be followed.	Incident Management Protocol, as developed as part of the Water Safety Plan and W_2RAP needs to be implemented.
	Operational Alert Levels for the WTWs and WWTWs, as developed as part of the O&M Manuals, the Water Safety Plan and W_2RAP needs to be implemented.	Ensure Operational Alert Levels for the WTWs and WWTWs are used by the Process Controllers for Process Optimisation.
	Existing Operational Sampling Programme at the WWTW is not adequate to ensure optimal Process Control.	Proposed Operational Sampling Programme, as included in the W_2RAP, needs to be implemented. SOPs should also be developed for each of the components of the WWTWs
	Shortcomings were identified as part of the Water Safety Plans and W_2RAPs.	Implement Improvement / Upgrade Plans of Water Safety Plans and W_2RAPs
Associated Services	-	-

Table 14.1.1: Needs identified through the WSDP process and possible improvements / projects		
Topic	**Short Coming**	**Possible Improvements / Projects**
Conservation and Demand Management	Reduce NRW is in Ashton and Bonnievale where the NRW was 32.5% and 35.6% respectively.	Implement the newly developed WDM Strategy. Langeberg Municipality needs to ensure that adequate funding is allocated under their Capital and Operational budgets towards the implementation of the WC/WDM initiatives. All external funding that could be utilised by Langeberg Municipality for this purpose should be sourced.
	The zones identified as part of the night flow analysis with higher than expected leakage were as follows: • Robertson Reservoir 1 • Nkqubela Reservoir • Bonnievale New Reservoir East It was not possible to measure night flows in Zolani in Ashton, but it is possible that this areas will also have excess night flow.	It is estimated that a budget of R200 000 will be adequate to undertake leak detection in zones with high night flows. It will be necessary to allocate approximately R100 000 per year additional for general visual leak inspections. It is recommended to re-log the night flows very few years to evaluate if there has been an increase in leakage.
	Some reservoir inlets and outlets are metered, but some zones still require additional meters.	The additional bulk water meters proposed in the WC/WDM Strategy Report are four for Montagu, two for McGregor, four for Ashton, two for Bonnievale and five for Robertson. It is important that all bulk meter readings are recorded monthly and not only the WTW's meters.
	The billing data assessment undertaken by GLS Consulting identified the following metering anomalies. • 1 028 Properties had recorded water use of less than 0.1 kl/d over the last year. • 727 developed stands could not be linked to a water meter. Some of these properties may have pre-paid meters, some may not be metered and at others the meter location and details may have to be verified. • Stands for which consumption drastically increased or reduced over the last three months were also identified.	A complete meter audit should be undertaken in all towns. All illegible / broken / old meters should be replaced. Any un-metered stand identified should be metered and meter readings in the billing system should be updated where required. As part of the audit all meter boxes should also be cleaned.
	It is important for the Municipality to focus on the following WDM projects, as also included in the WDM Strategy: • Leaks at domestic properties in poor areas. • Water saving devices. • Schools Education Programme on WC/WDM • Public Awareness Raising	Langeberg Municipality needs to investigate all leaks at domestic properties in poor areas with consumption above 15 kl / month. The Municipality also needs to focus on the installation of water saving devices (specific water efficient toilets) in all their municipal buildings and needs to raise awareness regarding conservation projects and the installation of these products in order to reduce the water demand and their percentage of NRW. At least once a year, a schools education programme on water conservation should be undertaken. The Municipality should assist the school(s) with the monitoring (water audit) of their water consumption. Engagement with the public and stakeholders through media and other mediums will highlight important principles of the efficient use of water, to ensure that relevant information is shared and the public is educated and that the profile of WC/WDM is heightened to achieve buy-in, involvement and accountability from citizens.
Water Resource	Registration of water use with the DWA.	Ensure all bulk water abstraction from the various sources is registered with the DWA and legalised.
	The immediate augmentation of Bonnievale, Montagu and Ashton water sources is critical in order to meet future demands. The allocation for Bonnievale from the Zanddrift WUA canal is already exceeded, as well as the allocations and safe yields of the Montagu sources.	Apply for RBIG funding support from the DWA for the augmentation of the Bonnievale and Montagu sources.

Table 14.1.1: Needs identified through the WSDP process and possible improvements / projects		
Topic	**Short Coming**	**Possible Improvements / Projects**
	The industrial consumers in Langeberg Municipality's Management Area are not yet monitored, with regard to the quality and volume of effluent discharged by them.	Ensure that all industries apply for the discharge of industrial effluent into the sewer system, to monitor the quality and volume of industrial effluent discharged and to implement the set of by-laws with regard to the discharge of industrial effluent into Langeberg Municipality's sewer system in order to determine whether the quality comply with the standards and criteria.
Financial Profile	A rising block step water tariff system is not yet implemented by Langeberg Municipality and the current tariff system does not discourage the wasteful or inefficient use of water.	The Municipality is currently busy with a study to review their tariff system, in order to implement a step block rising tariff structure in the future.
	Monitoring of effluent discharged by industrial consumers and the billing of industrial consumers according to the quality of effluent discharged by them.	The quantity of wastewater discharged by the industrial consumers into Langeberg Municipality's sewer system needs to be metered and the quality needs to be monitored regularly by Langeberg Municipality. Industrial consumers need to be billed according to the quality of effluent discharged by them.
	The tariff codes of Langeberg Municipality need to adequately differentiate between residential, commercial and industrial users within the various towns.	Tariff codes of the Municipality need to adequately differentiate between the different types of users. The codes also need to differentiate between the different towns. The codes can be further reviewed so that distinction can also be made between user types for Municipal Usage (e.g. parks, sports, fire fighting, etc.). A code should also be used to uniquely describe the water usage by schools.
	Develop IAMPs for all water and sewer infrastructure, which will indicate the real replacement values, the service life of the assets and the funds required to provide for adequate asset replacement.	Develop an IAMP
Institutional Arrangements	All critical vacant water and sanitation positions as indicated on the approved Organogram needs to be filled as soon as possible. Langeberg Municipality needs to review the skills needed at each of the WTWs and WWTWs according to the classification of the WTWs and WWTWs and need to align resources to these needs as well as reviewing the total staff numbers necessary to meet all the objectives in the National Water Act.	Aligning the career paths to the occupational categories will assist the personnel to understand levels within across teams. Simplification of job titles to conform to respective occupational categories will assist in developing compatible and comparable career paths within the different Departments. Occupational categories will provide differentiation between levels. This approach will allow for more specific job designations in organograms with explicit career path connotations.
	Continue with the mentoring role for operational personnel ensuring an adequately trained and classified workforce with dedicated training programmes for supervisors and operational personnel.	Ensure all required water and sanitation training is included in the Municipality's Workplace Skills Plan. Establish budgets to address the shortfall of skilled personnel, rethink methods to retain qualified personnel and plan for clear career paths.
	Langeberg Municipality can also continue to actively focus on in-house training, which requires the identification of trainers (from senior operators / officers / professional ranks) for the development and facilitation of courses which relate to specific organizational knowledge and systems requirements.	Langeberg Municipality's internal reports such as the Water Safety Plan, W_2RAP, Operation and Maintenance Manuals and this WSDP have the necessary information on which the in-house courses can be based. This will assist Langeberg Municipality's Human Resource Department in general and the skills development facilitator in particular to develop and implement effective workplace skills plans relevant to Human Capacity Development requirements.
Social and Customer Service Requirements	All critical water and sanitation stats need to be kept up to date and monitored on a monthly basis (Number of complaints; pipe breakages; sewer blockages; meters tested, replaced and repaired; septic tanks pumped, etc.)	Ensure all water and sanitation stats are kept up to date and included in the Monthly Reports.

14.2 Gaps and Strategies

Langeberg Municipality's proposed key capital infrastructure projects for the next three years are as follows:

- Replace and install bulk water meters.
- New reservoir for Bonnievale and security fencing around existing reservoirs and pump stations.
- Continue with the replacement of various sections of the old internal water reticulation networks.
- Improve the water supply for the Reservoir 1 zone in Robertson, according to the Water Master Plan.
- Implement new booster pump zone in McGregor, according to the Water Master Plan.
- Installation of services for Uitsig in Bonnievale.
- Upgrading of the Montagu WWTW.
- Upgrading of the Bonnievale sewer pump stations and portions of the sewer drainage networks.
- Upgrading of sections of the Montagu sewer drainage networks.

The table below gives more detail of the individual projects, as included in the proposed Three Year Capital Budget for 2014/2015.

Table 14.2.1: Water and sewerage capital projects, as included in the proposed Three Year Capital Budget for 2014/2015

Project name	Local Area	Project type (e.g. bulk, reticulation, etc.)	Schedule Date, Estimated Cost		
			14/15	15/16	16/17
WATER					
Replace / Install Bulk Water Meters	Management Area	Metering	R400 000	R0	R0
Installation of services Uitsig	Bonnievale	Reticulation	R1 000 000	R500 000	R500 000
Fencing of water and sewerage installations	Management Area	Security	R1 200 000	R1 000 000	R1 000 000
Bonnievale reservoir	Bonnievale	Reservoir	R14 170 700	R0	R0
Replacements / Repairs: Network Phase 3	Management Area	Reticulation	R2 067 430	R0	R0
Improve supply to reservoir 1 zone, Robertson	Robertson	Reticulation	R0	R5 500 000	R0
Implement new booster pump zone, McGregor	McGregor	Reticulation	R0	R1 500 000	R0
Total			**R18 838 130**	**R8 500 000**	**R1 500 000**
SEWERAGE					
Upgrading of WWTW	Montagu	WWTW	R1 907 500	R6 462 950	R0
Purchase of Jet Vac machine	Management Area	Other	R2 900 000	R0	R0
Upgrade Bonnievale pump stations	Bonnievale	Pump Stations	R0	R0	R1 700 000
PS2 Catchment network upgrades	Bonnievale	Reticulation	R0	R0	R1 500 000
Development of related infrastructure PS1 catchment	Montagu	Reticulation	R0	R0	R3 400 000
Total			**R4 807 500**	**R6 462 950**	**R6 600 000**

Langeberg Municipality's implementation strategies, with regard to new water and sewerage infrastructure, are as follows:

- Augmentation of the existing water sources in Bonnievale, Montagu and Ashton.

- 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 two to three years and to use the Master Plans to list the desired infrastructure development requirements and reflect these in the IDP.

- Ensure adequate funds are allocated on an annual basis towards the rehabilitation and maintenance of the existing water and sewerage infrastructure.

- 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 Langeberg Municipality's new WDM Strategy 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) in accordance with the availability of water and the capacity of WTWs and WWTWs that are in place or that will be implemented.