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Version Control:

Status	Description	Date	Reference
Draft Documents	WSDP Documents for 2017-2022 (First Cycle): • WSDP-IDP Water Sector Input Report • eWSDP • Module 2: Base and Compliance Data • Module 3: Strategies	Busy with drafting	Draft documents
Approval	WSDP Documents for 2017-2022 (First Cycle): • WSDP-IDP Water Sector Input Report • eWSDP • Module 2: Base and Compliance Data • Module 3: Strategies	Will be submitted to Council	Council Resolution for approval will be forwarded by the Municipality to the DWS.

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PROJECT 270940 - BEAUFORT WEST MUNICIPALITY'S WSDP FOR 2017-2022 (FIRST CYCLE)

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
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BEAUFORT WEST MUNICIPALITY

WSDP – IDP WATER SECTOR INPUT REPORT (EXECUTIVE SUMMARY)

ITEM **DESCRIPTION** **PAGE**

LIST OF TABLES

Section A: Status Quo Overview

Section B: State of Water Services Planning

Section C: Water Services Existing Needs Perspective

LIST OF TABLES

ABBREVIATIONS

ADWF	Average Dry Weather Flow
AMP	Asset Management Plan
AMR	Automatic Meter Reading
BDS	Blue Drop System
BWM	Beaufort West Municipality
CIP	Critical Infrastructure Programme
COD	Chemical Oxygen Demand
CRC	Current Replacement Cost
CRR	Cumulative Risk Ratio
DMA	District Management Area
DRC	Depreciated Replacement Cost
DWQ	Drinking Water Quality
DWS	Department of Water and Sanitation
EPWP	Expanded Public Works Programme
GAMAP	General Accepted Municipal Accounting Practice
GDS	Green Drop System
GGP	Gross Geographic Product
GRAP	Generally Recognized Accounting Practice
GWSA	Green Water Services Audit
HIV	Human Immunodeficiency Virus
IAMP	Infrastructure Asset Management Plan
IDP	Integrated Development Plan
ILI	Infrastructure Leakage Index
IMP	Incident Management Protocol
IMQS	Infrastructure Management Query System
IRDP	Integrated Rural Development Program
IRP	Integrated Resource Plan
KPA	Key Performance Area
LED	Local Economic Development
LGTAS	Local Government Turn Around Strategy
m	Metre
MAP	Mean Annual Precipitation
MIG	Municipal Infrastructure Grant
MIS	Management Information Systems
MISA	Municipal Infrastructure Support Agent
Ml	Mega Litre
Mℓ	Mega Litre
Ml/a	Mega Litre per Annum
MNF	Minimum Night Flow
MTEF	Medium Term Expenditure Framework
NGDB	National Groundwater Database
NMR	No Monitoring Required
NNE	North-northeast
NRW	Non-Revenue Water
NSDP	National Spatial Development Perspective
NWRS	National Water Resource Strategy

PAT	Progress Assessment Tool
PDD	Peak Daily Demand
PRV	Pressure Reducing Valve
PVC	Polyvinyl Chloride
RDP	Reconstruction and Development Programme
RSA	Republic of South Africa
RUL	Remaining Useful Life
SALGA	South African Local Government Association
SANS	South African National Standard
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SMME	Small, Medium and Micro-sized Enterprises
SSW	South-southwest
STW	Sanitation Treatment Works
UAW	Unaccounted for Water
WDM	Water Demand Management
WMA	Water Management Area
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSP	Water Services Provider
WTW	Water Treatment Works
WWTW	Waste Water Treatment Works

KEY TERMS	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.
CRC	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset. GAMAP defines CRC as the cost the entity would incur to acquire the asset on the reporting date.
DRC	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
IDP	A municipal plan as defined in the Municipal Systems Act.
MIG	A conditional grant from national government to support investment in basic municipal infrastructure.
RUL	The time remaining over which an asset is expected to be used.
Strategic Framework for Water Services	The Strategic Framework provides a comprehensive summary of policy with respect to the water services sector in South Africa and sets out a strategic framework for its implementation over the next ten years.
WSA	A WSA is any municipality that has the executive authority to provide water services within its area of jurisdiction in terms of the Municipal Structures Act 118 of 1998 or the ministerial authorisations made in terms of this Act. There can only be one water services authority in any specific area. Water services authority area boundaries cannot overlap. Water services authorities are metropolitan municipalities, district municipalities and authorised local municipalities.
WSDP	A plan for water and sanitation services in terms of the Water Services Act.

KEY TERMS

TERM	INTERPRETATION
WSP	A Water services provider is • Any person who has a contract with a water services authority or another water services provider to sell water to, and/or accept wastewater for the purpose of treatment from, that authority or provider (bulk water services provider); and / or • Any person who has a contract with a water services authority to assume operational responsibility for providing water services to one or more consumers (end users) within a specific geographic area (retail water services provider); or • A water services authority which 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 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.

WSDP – IDP Water Sector Input Report (Executive Summary)

Introduction

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, as part of the process of preparing an IDP. The DWS has developed a new eWSDP system to assist WSAs with their WSDP process and to provide a framework for the capturing of the data. The business elements included in the website and also addressed in detail in the two Modules of Beaufort West 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 2017-2022 WSDP (First Cycle) of Beaufort West Municipality consists of the following documents.

- WSDP-IDP Water Sector Input Report (For Council approval and Public Participation Process).
- eWSDP: Base data and an overview and assessment of the status of information and strategies on a WSA level.
- Module 2: Base and Compliance data.
- Module 3: Strategies.

The primary instrument of planning in the water services sector is the WSDP. The following principles apply to the WSDP, as taken from the Strategic Framework for Water Services (2003):

- 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 the DWS.

- A WSA must report annually and in a public way on progress in implementing the plan.

The purpose of this report is to provide relevant and summarised WSDP inputs for incorporation into Beaufort West Municipality's IDP process and is structured as follows:

Section A: Status Quo Overview: Provides a summarised overview of the water services status quo in terms of the water services functional business elements as aligned to the WSDP framework.

Section B: State of Water Services Planning: Presents the status of- and references the water services planning within Beaufort West Municipality.

Section C: Water Services Existing Needs Perspective: Gives an overview of Beaufort West Municipality's assessment and interpretation of its water services, with specific focus on problem definition statements.

Section D: Water Services Objectives and Strategies: Outlines the 5-year water services objectives and strategies as developed through the WSDP process for incorporation in terms of the IDP and aligned to the water services functional business elements.

Section E: Water Services MTEF Projects: The agreed water services projects for the medium-term expenditure framework and inclusive of funding sources.

Section F: WSDP Projects: Presents the projects identified during the WSDP process in order to meet the water services strategies of Beaufort West Municipality, as aligned to the outflow from the situation analysis per water services business element.

SECTION A: STATUS QUO OVERVIEW

Business Element 1: 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. Section 15 of the Act requires that the WSA must supply a copy of the WSDP to the Minister of Water and Sanitation, Minister of Provincial and Local Government, the relevant Province and all neighbouring WSAs.

The 2017-2022 (First Cycle) 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.

Business Element 2: Demographics

Beaufort West Municipality falls within the newly established Breede-Gouritz Water Management Area (WMA) and is located within the Central Karoo District of the Western Cape Province, in which the following local municipalities are also located:

- Laingsburg; and
- Prince Albert;

The Municipality consists of seven (7) individual wards, and is the only WSA within this municipal area. It is also the Water Services Provider (WSP). Its responsibility as WSA also extends to the rural areas within its boundary. Beaufort West Municipality's Management Area includes the following towns:

- The large town of Beaufort West.
- The small towns of Merweville, Nelspoort and Murraysburg.
- The rural farm areas.

Water is supplied via independent water distribution systems to Beaufort West, Merweville, Nelspoort and Murraysburg. Beaufort West and Nelspoort are reliant on surface and groundwater sources, while Merweville and Murraysburg only utilise groundwater sources. Beaufort West Municipality also operates its own WTWs and WWTWs.

The most significant challenges, from a Water Services perspective, are the augmentation of the existing groundwater resources for Beaufort West, upgrading of the Nelspoort and Murraysburg oxidation ponds, the refurbishment and upgrading of the existing water and sewer networks and pump stations and to ensure the provision of basic services to rural communities located on private farms. Beaufort West Municipality will continue to develop strategies and action plans, in collaboration with farm owners, in order for the Municipality to fulfil its legal obligations and responsibilities as WSA for the provision of basic services.

Physical Perspective

Global warming

The risk of global warming that is likely to strike the Western Cape poses threats in rainfall amounts and changing seasonality of rain. Future projections of climate show that there is going to be fewer strong or deeper low-pressure systems in winter months (June, July and August) resulting in less rainfall. In addition to predicted decline in rainfall, increased temperatures in the Western Cape would further result in increased evaporation and an increase in irrigation requirements. Although this has no impact on current water requirement estimates, the impact of climate change must be taken into consideration when developing planning scenarios for future water requirements.

Shortage of rain or changing seasonal patterns will not only affect dam levels, but will also severely hamper agricultural production as crops currently produced are based on the current season of rain.

It is necessary for WSAs to develop climate response strategies and include these in their WSDPs, implement WC/WDM and reduce levels of NRW. Water-related climate change adaptation and mitigation planning should be incorporated into all WSDPs and IDPs. The implementation of WC/WDM is a critical element of adapting to climate change. This must be implemented by all water sector institutions and water users, and should include the optimisation of dam and groundwater operation, as well as the reduction of physical water losses and the introduction of water-efficient appliances, processes and crops.

It is therefore advisable for Beaufort West 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.
- Diversify water resources, e.g. surface water, groundwater, wastewater re-use and sea water desalination.

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 Beaufort West Municipality's Management Area falls within the Karoo macro biogeographically region that includes the arid interior and arid coastal plains of the northern West Coast and the plains of the Great Karoo. This area stretches far beyond the boundaries of the Western Cape Province. The Western Cape largely falls within the world-renowned Cape Floral Kingdom and includes a number of biomes, namely the Fynbos-, Forest-, Nama-Karoo-, Succulent Karoo- and Thicket Biomes.

The Beaufort West Municipality's Management Area also falls within the Nama-Karoo Biome and is described as grassy dwarf scrubland. In spite of its significant scientific importance and sensitivity, less than 1% of the biome has statutory conservation status. The only primary statutory conservation area in the Beaufort West Municipality's Management Area is the Karoo National Park.

The Karoo National Park is a unique national and international tourist attraction. The 75 000 ha park is on the outskirts of Beaufort West and was proclaimed a park in 1979. The vision was to preserve a representative portion of the Great Karoo as part of South Africa's natural heritage.

A Riparian Habitat Rehabilitation Project is underway in and around the municipality. The purpose of the rehabilitation project is to repair river systems. These rivers have been damaged by poor farming practices and other human activities and has led to the Riverine Rabbit (an important biological indicator species) becoming endangered. The project consists of four conservancies of which the Sak River Conservancy and the Krom River Conservancy fall within the Beaufort West Municipality.

The 2013 reviewed and adopted SDF stipulates inter alia the following:

- Vegetation within the municipality is classified as Least Threatened. Proper management and policies should be ensured to maintain this status.
- No urban development should be permitted in the areas identified as CBAs or the Protected Areas.

- The municipality must promote and encourage the actions taken to improve riverine environments, especially the Riparian Habitat Rehabilitation Project undertaken by the Climate Action Partnership.

Demographic Perspective

Economics

Beaufort West is the "Primary Regional Service Centre". The economic activity of Central Karoo District is highly concentrated around Beaufort West and economic activity is sparsely dispersed in the surrounding areas where agriculture is under pressure, unemployment levels and poverty are high and human capital capacity is low. Beaufort West is seen as a "Gateway to the Western Cape" and some opportunities exist linked to tourism and logistics. However, currently Beaufort West is evaluated as an area with low growth potential, while Murraysburg and Merweville are considered to have very low growth potential.

Social

Beaufort West has been identified as a relatively high priority investment in terms of the NSDP Investment criteria. Murraysburg, Merweville and Nelspoort are smaller villages with very low development potential and high social needs.

Regional Perspective

The Central Karoo District Growth and Development Strategy seeks to achieve a shared vision, amongst all sectors of its society, for the achievement of its goal of reducing poverty and improving the quality of life of all its citizens. The Central Karoo District Growth and Development Strategy reinforces the following principles:

- Integrated, sustainable, holistic and participatory growth and development;
- Providing for the needs of all the people;
- Ensuring community and / or beneficiary involvement and ownership;
- Long term sustainability on all levels; and
- Equitable socio-economic development with equitable benefits for all.

The 2014/2015 population of Beaufort West Municipality was established by applying an annual growth rate of 1.34% to the 2011 Census population figures. The annual population growth percentages for the individual towns are included in Table A.7, which were agreed with the Municipality during January 2014. The current estimated population figures and the annual population growth percentages used in this WSDP-IDP Water Sector Input Report are aligned with the figures used in DWS's National GeoDatabase, which forms the baseline for the WSDP Guide Framework. The table below gives an overview of the population and households and the water and sanitation service level categories in Beaufort West Municipality's Management Area.

Table A.1: Water Services Overview

Settlement Type	2011/2012 Households	2011/2012 Population	2014/2015 Households	2014/2015 Population	Water category: Adequate: Formal	Adequate: Informal	Adequate: Sahred Services	Water resources needs only	O&M needs only	Infrastructure needs only	Infrastructure & O&M needs	Infrastructure, O&M & Resource need	No Services: Informal	No Services: Formal	Sanitation category: Adequate: Formal	Adequate: Informal	Adequate: Sahred Services	Water resources needs only	O&M needs only	Infrastructure needs only	Infrastructure & O&M needs	Infrastructure, O&M & Resource need	No Services: Informal	No Services: Formal
URBAN																								
Metropolitan Area					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Formal Town					Adequate			Below RDP					None		Adequate			Below RDP					None	
Beaufort West	8,867	34,025	9,273	35582	P		P																	
Merweville	435	1,552	455	1625	P		P																	
Nelspoort	408	1,699	420	1750	P		P																	
Murraysburg	1,249	5,039	1,306	5271	P		P																	
Sub-Total	**10,959**	**42,315**	**11,455**	**44,228**	**4**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**
Townships					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Informal Settlements					Adequate			Below RDP					None		Adequate			Below RDP					None	
Beaufort West	15	60	15	60		P																		
Merweville	10	40	10	40																				
Murraysburg	6	30	6	30																				
Sub-Total	**31**	**130**	**31**	**130**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Working towns & service centres					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Sub-Total: (Urban)	**10,990**	**42,445**	**11,486**	**44,358**	**5**	**1**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**
RURAL																								
Rural / Farming					Adequate			Below RDP					None		Adequate			Below RDP					None	
Beaufort West Rural	2,101	7,141	2,133	7,249	P		P							P										
Sub-Total	**2,101**	**7,141**	**2,133**	**7,249**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Informal Settlements					Adequate			Below RDP					None		Adequate			Below RDP					None	
Sub-Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Sub-Total (Rural)	**2,101**	**7,141**	**2,133**	**7,249**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL	**13,091**	**49,586**	**13,618**	**51,606**	**6**	**1**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**

The Growth Potential Study 2014, of the Western Cape Government determined the growth potential and socio-economic needs of settlements in the Western Cape using quantitative data (e.g. factors relating to socio-economic, economic, physical-environmental, infrastructure and institutional aspects). The table below gives an overview of the growth potential indicators for the towns in Beaufort West Municipality's Management Area, as included in the Growth Potential Study.

Table A.2: Growth potential indicators for the towns in Beaufort West Municipality's Management Area (Settlement Level Classification)

Indicator	Beaufort West	Merweville	Nelspoort	Murraysburg
Absolute socio-economic needs	High	Very Low	-	Low
Proportional socio-economic needs	Medium	High	-	Very High
Human capital index	Low	Low	-	Very Low
Economic index	Low	Very Low	-	Very Low
Physical index	Very Low	Low	-	Very Low
Infrastructure	Medium	Low	-	Very Low
Institutional	Very High	Medium	-	High

Business Element 3: Service Levels

The table and graph below give an overview of the water service delivery access profile in Beaufort West Municipality's Management Area.

Table A.3: Residential water services delivery access profile: Water

Census Category	Description	Year 0 FY2014/15		Year -1 FY2013/14		Year -2 FY2012/13	
		Nr	%	Nr	%	Nr	%
	WATER (ABOVE MIN LEVEL)						
Piped (tap) water inside dwelling/institution	House connections	12,745	93%	12,500	92%	11,981	89%
Piped (tap) water inside yard	Yard connections	875	6%	960	7%	1,323	10%
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	Standpipe connection < 200 m	75	1%	75	1%	75	1%
	Sub-Total: Minimum Serivce Level and Above	**13,695**	**100%**	**13,535**	**100%**	**13,379**	**100%**
	WATER (BELOW MIN LEVEL)						
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	Standpipe connection: > 200 m < 500 m	25	0%	25	0%	25	0%
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution	Standpipe connection: > 500 m < 1 000 m	4	0%	4	0%	4	0%
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	Standpipe connection: > 1 000 m	0	0%	0	0%	0	0%
No access to piped (tap) water	No services	34	0%	34	0%	34	0%
	Sub-Total: Below Minimum Service Level	**63**	**0%**	**63**	**0%**	**63**	**0%**
	Total number of households	**13,758**	**100%**	**13,598**	**100%**	**13,442**	**100%**

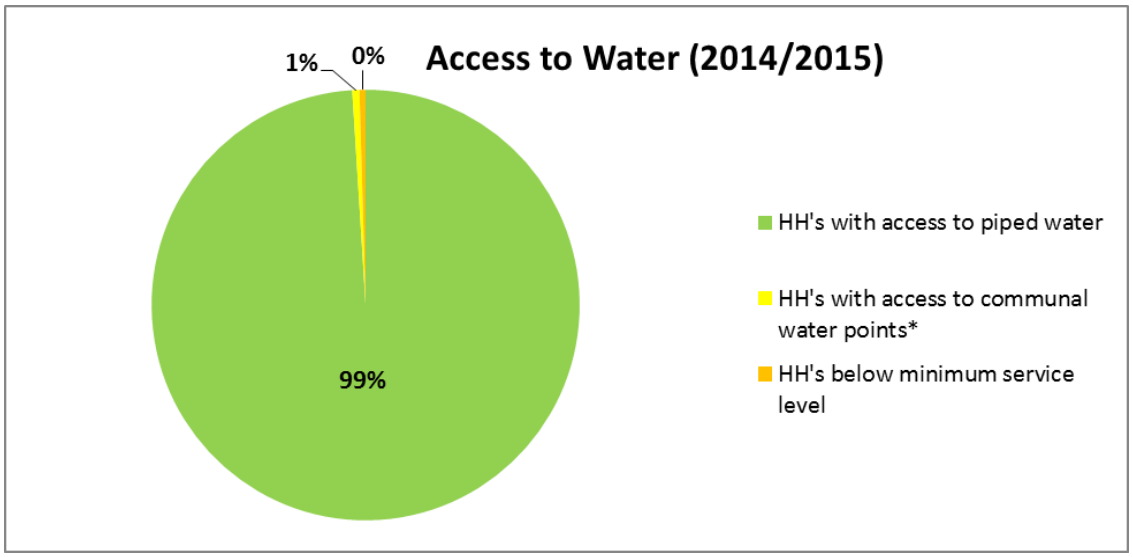


Figure A.1: Access to water services in 2014/2015.

The existing residential water service levels for the various towns in Beaufort West Municipality's Management Area are estimated as follows (June 2015):

Table A.4: Residential water service levels (Consumers)

Service Level	Beaufort West	Merweville	Nelspoort	Murraysburg	Farms	Total
No Water Services	0	0	0	0	34 [3)]	34
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0
Below RDP: Infrastructure Extension	0	0	0	0	29 [4)]	29
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**63**	**63**
Below Housing Interim [5)]	0	0	0	0	0	0
Adequate Housing Permanent [6)]	15	10	0	6	0	31
Total Housing Need	**15**	**10**	**0**	**6**	**0**	**31**
Standpipes	0	0	0	0	44	44
Yard Connections [7)]	150	17	51	0	657	875
House Connections	9 123 [2)]	438 [2)]	369 [2)]	1 446 [2)]	1 369	12 745
Total Adequate	**9 273**	**455**	**420**	**1 446**	**2 070**	**13 664**
Total	**9 288**	**465**	**420**	**1 452**	**2 133**	**13 758**

Notes: 1) There are no households in the urban areas with existing water service levels below RDP standard.

2) Beaufort West, Nelspoort, Merweville and Murraysburg: Number of residential consumer units for 2014/2015, as indicated by the Municipality.

3) Census 2011: Number of households with no access to piped (tap) water 34

4) Census 2011: Number of households with communal services (200m – 500m) 25, (500m – 1000m) 4 and (>1000m) 0.

5) Below Housing Interim in the above table is the number of shacks in informal areas without basic water services. There are no such areas in Beaufort West Municipality's Management Area.

6) Adequate Housing Permanent in the above table is the number of shacks in informal areas with communal water services. Number of households with communal services in informal areas was confirmed by the Municipality.

7) Estimated number of backyard dwellers on formal erven in the urban areas, which was calculated from the 2014/2015 projected number of households.

The table and graph below give an overview of the sanitation service delivery access profile in Beaufort West Municipality's Management Area.

Table A.5: Residential water services delivery access profile: Sanitation

Census Category	Description	Year 0 FY2014/15		Year -1 FY2013/14		Year -2 FY2012/13	
		Nr	%	Nr	%	Nr	%
	SANITATION (ABOVE MIN LEVEL)						
Flush toilet (connected to sewerage system)	Waterborne	11,515	84%	11,366	84%	11,220	83%
	Waterborne: Low Flush	0	0%	0	0%	0	0%
Flush toilet (with septic tank)	Septic tanks / Conservancy	1,373	10%	1,362	10%	1,352	10%
Chemical toilet	Non-waterborne (above min. service level)	44	0%	44	0%	44	0%
Pit toilet with ventilation (VIP)		350	3%	350	3%	350	3%
Other / Communal Services		0	0%	0	0%	0	0%
	Sub-Total: Minimum Serivce Level and Above	**13,282**	**97%**	**13,122**	**96%**	**12,966**	**96%**
	SANITATION (BELOW MIN LEVEL)						
Pit toilet without ventilation	Pit toilet	125	1%	125	1%	125	1%
Bucket toilet	Bucket toilet	56	0%	56	0%	56	0%
Other toilet provision (below min. service level	Other	20	0%	20	0%	20	0%
No toilet provisions	No services	275	2%	275	2%	275	2%
	Sub-Total: Below Minimum Service Level	**476**	**3%**	**476**	**4%**	**476**	**4%**
	Total number of households	**13,758**	**100%**	**13,598**	**100%**	**13,442**	**100%**

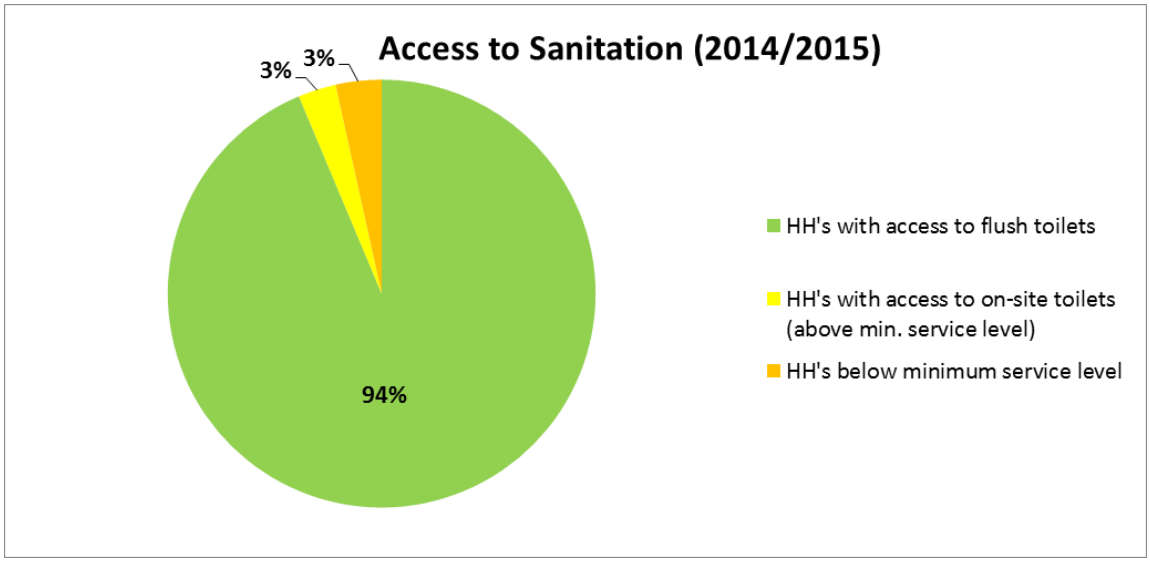


Figure A.2: Access to sanitation services in 2014/2015.

The existing residential sanitation service levels for the various towns in Beaufort West Municipality's Management Area are estimated as follows (June 2015):

Table A.6: Residential sanitation service levels (Consumers)						
Service Levels	**Beaufort West**	**Merweville**	**Nelspoort**	**Murraysburg**	**Farms**	**Total**
No Sanitation Services	0	0	0	0	275 [2)]	275
Below RDP: Infrastructure Upgrade	0	0	0	0	245 [3)]	245
Below RDP: Infrastructure Extension	0	0	0	0	0	0
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0
Total Basic Need (RDP)	**0**	**0**	**0**	**0**	**520**	**520**
Below Housing Interim [5)]	0	0	0	0	0	0
Adequate Housing Permanent [6)]	15	10	0	6	0	31
Total Housing Need	**15**	**10**	**0**	**6**	**0**	**31**
None Waterborne	0	0	0	0	350 [4)]	350
Waterborne Low Flush	0	0	0	0	0	0
Septic Tanks / Conservancy	0	85	0	25	1 263	1 373
Waterborne WWTW [1)]	9 273	370	420	1 421	0	11 484
Total Adequate	**9 273**	**455**	**420**	**1 446**	**1 613**	**13 207**
Total	**9 288**	**465**	**420**	**1 452**	**2 133**	**13 758**

Notes: 1) Include Backyard dwellers

2) Census 2011: Number of households with no toilet facility 275.

3) Census 2011: Number of households with existing buckets 56, chemical toilets 44, pit toilets without ventilation 125 and "other" 20.

4) Census 2011: Number of households with pit toilets with ventilation 350.

5) Below Housing Interim in the above table is the number of shacks in informal areas without basic sanitation services. There are no such areas in Beaufort West Municipality's Management Area.

6) Adequate Housing Permanent in the above table is the number of shacks in informal areas with communal ablution facilities. Number of households with communal services in informal areas was confirmed by the Municipality.

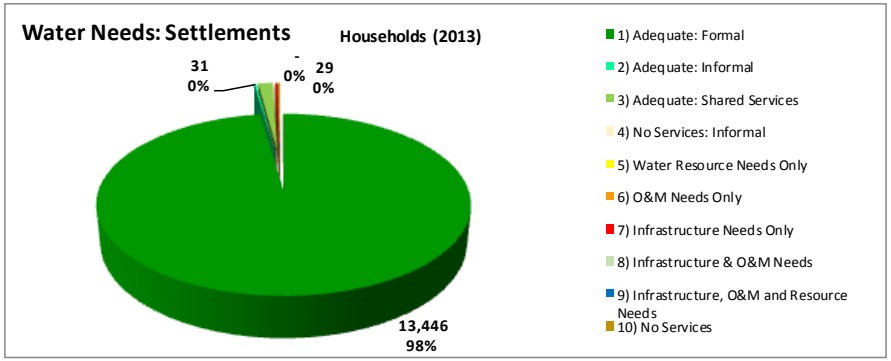
The number of user connections in each user sector, for the various distribution systems in Beaufort West Municipality's Management Area, is as follows:

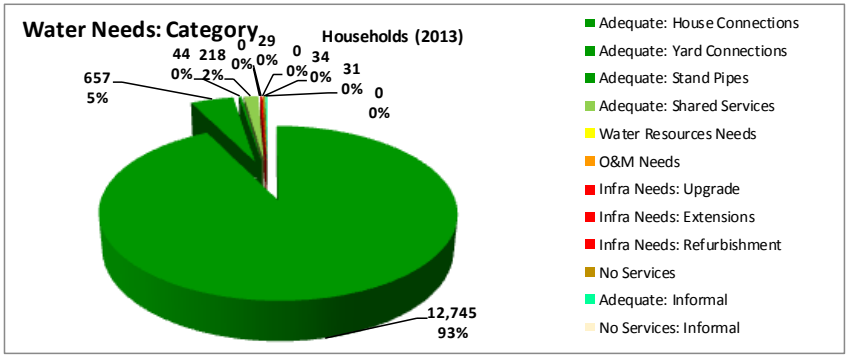
Table A.7: Number of user connections in each user sector served by Beaufort West Municipality						
Town	**Projected Population for 2014/2015**	**No of Residential Consumer Units**	**No of dry Industrial / Commercial Consumer Units**	**No of Wet Industrial Consumer Units**	**No. other Units**	**Total**
Beaufort West	35 641	9 123	291	3	51	**9 468**
Merweville	1 665	438	3	0	17	**458**
Nelspoort	1 750	369	4	0	0	**373**
Murraysburg	5 301	1 446	4	0	4	**1 454**
Farms	7 249	0	0	0	0	**0**
TOTALS	**51 606**	**11 376**	**302**	**3**	**72**	**11 753**

All the households in the urban areas of Beaufort West Municipality's Management Area are provided with water connections inside the houses. Informal areas are supplied with shared services as an intermediary measure. Beaufort West Municipality is committed to support the private landowners as far as possible in order to ensure that the households with existing water and sanitation services still below RDP standard are provided with at least basic services. To adequately monitor the provision of basic water and sanitation services on privately owned land is however a big challenge for the Municipality.

Table A.8(a): Residential Water Services Ddelivery Adequacy Profile (Water)

Water Categorisation	Number of settlements	FORMAL																		INFORMAL			
		Adequate								Water Resource needs		O & M Needs		Infrastructure Needs						No services		Adequate		No services	
		House Connections		Yard Connections		Stand Pipes		Shared Services						Upgrades		Extensions		Refurbishment							
		HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
1	37	12,745	100%	657	100%	44	100%																		
2	3																					31	100%		
3	10							218	100%																
4	0																								
5	0																								
6	0																								
7	3															29	100%								
8	0																								
9	0																								
10	3																			34	100%				
Total Household Interventions required		12,745		657		44		218		0		0		0		29		0		34		31		0	

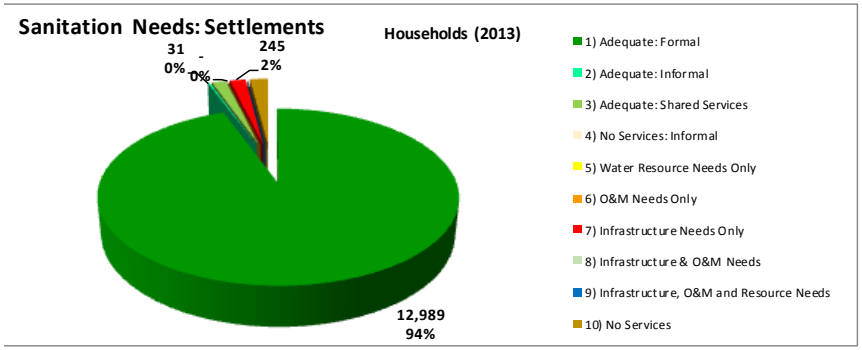


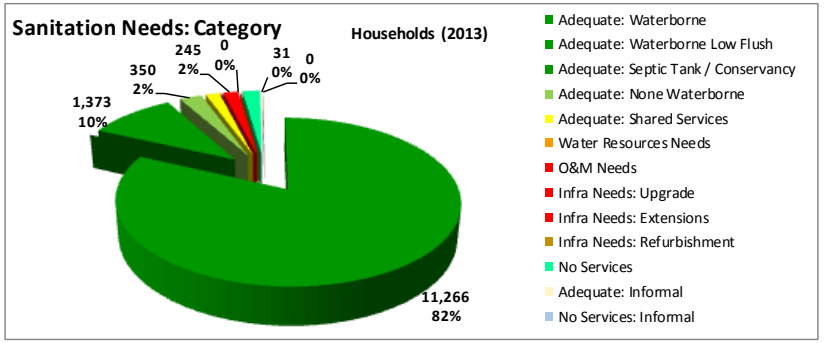


1	Adequate	3	Adequate: Shared services	5	Water Resources Needs **Only**	7	Infrastructure Needs **Only**	9	Infrastructure, O&M & Resource Needs
2	Adequate: Informal	4	No Services: Informal	6	O & M Needs **Only**	8	Infrastructure& O&M needs	10	No Services

Table A.8(b): Residential Water Services Delivery Adequacy Profile (Sanitation)

Water Categorisation	Number of settlements	FORMAL																				INFORMAL			
		Adequate										Water Resource needs		O & M Needs		Infrastructure Needs						No services		Adequate		No services	
		Waterborne		Waterborne Low flush		Septic Tank/ Conservancy		None Waterborne		Shared Services						Upgrades		Extensions		Refurbishment							
		HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%	HH	%
1	37	11,266	100%			1,373	100%	350	100%																		
2	3																							31	100%		
3	10									218	100%																
4	0																										
5	0																										
6	0																										
7	3															245	100%										
8	0																										
9	0																										
10	3																					275	100%				
Total Household Interventions required		11,266		0		1,373		350		218		0		0		245		0		0		275		31		0	





1	Adequate	3	Adequate: Shared services	5	Water Resources Needs **Only**	7	Infrastructure Needs **Only**	9	Infrastructure, O&M & Resource Needs
2	Adequate: Informal	4	No Services: Informal	6	O & M Needs **Only**	8	Infrastructure& O&M needs	10	No Services

Business Element 4: Socio Economic

The population of Beaufort West Municipality is currently estimated at approximately 51 606 persons (13 618 Households) for 2014/2015. The municipal area covers 16 330.1 km² and the population density is a very low at 3.2 persons per square kilometre and the urban segment of the municipal population is expected to rise. The table below gives an overview of the historical population and household figures for Beaufort West Municipality.

Table A.9: Historical population and household figures of Beaufort West Municipality

Year	Area	Source	Population	Households
2001	Previous Beaufort West MA	Census 2001 Community Profiles	37 099	9 074
2001	Previous Central Karoo DMA	Census 2001 Community Profiles	6 191	1 570
Total			**43 290**	**10 644**
2007	Previous Beaufort West MA	2007 Community Survey	37 090	9 149
2007	Previous Central Karoo DMA	2007 Community Survey	5 609	1 845
Total			**42 699**	**10 994**
Official 2011 Census Data (DMA Included)			**49 587**	**13 089**

The historical population and household figures and population growth rates and projected present population and number of households for Beaufort West Municipality, for the various areas, are summarised in the table below.

Table A.10: Projected present population and population growth rates

Distribution System	Census 2001			Census 2011			2011	2014/2015		Number of Residential Households confirmed by Mun.
	P	H	P / H	P	H	P / H	Growth %/a	Projected Population	Number of Households (Permanent)	
Beaufort West	31 346	7 323	4.28	34 085	8 882	3.84	1.50%	35 641	9 288	9 123
Merweville	1 138	322	3.53	1 592	445	3.58	1.50%	1 665	465	438
Nelspoort	-	-	-	1 699	408	4.16	1.00%	1 750	420	369
Farms former BWM	4 615	1 429	3.23	7 141	2 101	3.40	0.50%	7 249	2 133	-
Farms former DMA	1 775	560	3.17							
Murraysburg	4 416	1 010	4.37	5 069	1 255	4.04	1.50%	5 301	1 312	1 446
TOTALS	**43 290**	**10 644**	**4.07**	**49 586**	**13 091**	**3.79**	**1.34%**	**51 606**	**13 618**	**11 376**

Note: Abbreviations P – Persons, H – Households and P/H - Person / Household

Agriculture forms the backbone of Beaufort West economy and accounts for the largest labour to date. Despite the harsh climate and poor carrying capacity of the veldt, it still offers opportunities for growth and employment creation. The municipality is dependent upon the following main economic activities.

Table A.11: Key economic activities in Beaufort West Municipality's Management Area

Key Economic Activities	Description
Agriculture and agri-processing	Fresh meat (mutton, game, karoo lamb, ostrich, goat, beef)
	Processed meat (biltong, cold meats, "droë wors")
	Fresh fruit and vegetables (figs, olives, apricots, grapes, herbs)
	Process fruit and vegetables (chutney, dried figs, olives, jams)
	Animal by-products (skins, hides, wool, mohair, milk)
	Processed animal by-products (leather products, dairy products, wool and mohair products)
	Other (traps for problem animals – manufacturing and servicing)
Transportation	The transportation sector in the Central Karoo is one of the strongest contributors to the regional economy and completely dominated by Beaufort West, which contributes 86.4% of the total GGP in this sector.
Tourism	Wide-open spaces, magnificent landscapes, panoramas and the sense of solitude attractions.
	Historic and cultural attractions.

Business Element 5: Water Services Infrastructure Management (Infrastructure)

Beaufort West: The town relies on a number of groundwater sources, as well as on surface water supplied from the Gamka Dam. The raw water is treated at the WTWs, which consist of flocculation, stabilisation, filtration and chlorination, where after it is distributed to the consumers. The capacity of the WTW is 4.32 Ml/day. Three bulk storage reservoirs are available, which are used to store treated water for supply to users in Beaufort West. The sizes of the three reservoirs are 4.55 Ml (x2) and 5.75 Ml, providing a total treated water storage capacity of 14.85 Ml.

A total of 75.4 km of pipes, ranging from 75mm dia. to 375mm dia. transfer bulk water within the Beaufort West area. The potable water reticulation network consists of a total of 161.6 km of pipework ranging from less than 45mm dia. to 675mm dia. There are three pump stations with pumps ranging from 18.5 kW to 45 kW and operating at heads between 50m and 85m.

Beaufort West is fully serviced with a formal sewer reticulation system. The reticulation system consists of 126.7 km of gravity pipelines and 1.1 km of rising mains. There are three sewer pump stations operated by Beaufort West Municipality with 8 l/s capacity each. The capacity of the Beaufort West WWTWs is 4.659 Ml/day.

Merweville: The town relies on seven boreholes for bulk water supply to the town. The raw water is chlorinated before it is distributed to the consumers. Two bulk storage reservoirs are available, which are used to store treated water for supply to users in Merweville. The sizes of the two reservoirs are 0.2 Ml each, providing a total treated water storage capacity of 0.4 Ml.

The potable water reticulation network consists of a total of 2.6 km of pipework ranging between 75mm dia. and 125mm dia. There are no internal water pump stations.

Merweville is partly serviced with a formal sewer reticulation system (New area). The reticulation system consists of 4.4 km of gravity pipelines. There are no sewer pump stations and the sewage gravitates to the oxidation dams.

Nelspoort: The town relies on two boreholes, as well as on surface water supplied from the Sout River. A third production borehole will be commissioned in the near future to assist with supply during drought periods. The raw water is treated at the WTW, which consists of filtration and chlorination, where after it is distributed to the consumers. One bulk storage reservoir with a capacity of 0.911 Ml is available, which is used to store treated water for supply to users in Nelspoort.

A total of 0.65 km of pipes, ranging between 125mm dia. and 275mm dia. transfer bulk water within the Nelspoort area. The potable water reticulation network consists of a total of 6.1 km of pipework ranging from 45mm dia. to 275mm dia. There is one pump station at the WTW with two pumps of 18.5 kW and operating at a head of 53m.

Nelspoort is fully serviced with a formal sewer reticulation system. The reticulation system consists of 5.1 km of gravity pipelines and 0.8 km of rising mains. There are two sewer pump stations operated by Beaufort West Municipality with capacities of 10 l/s and 13 l/s. The sewage from the Main sewer pump station is pumped to the oxidation dams. The Municipality is currently busy with the upgrading of the WWTW.

Murraysburg: The town is divided into two main sections called the North and Southern Section. Each of these Sections receives water from its own groundwater sources. Five production boreholes supply potable water to the town. There is no WTW or any water pump stations and the water gravitates from the storage reservoirs to the consumers. There is one sewer pump station from where the sewage is pumped through a rising main to the oxidation dams. The Municipality plan to upgrade the WWTW in the nearby future.

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

Table A.12: Summary of Beaufort West Municipality's existing water and sewerage infrastructure	
Component	**Description of the main functional tasks**
Boreholes, Gamka Dam and Sout River	Bulk water abstraction
Bulk Pipelines (81 km)	Bulk delivery (Exclude Murraysburg)
Water Reticulation (195km)	Distribution of potable water to consumers (Exclude Murraysburg)
Water Pump Stations (5)	Ensure adequate pressure and supply to specific areas
Reservoirs (10)	Balancing peak demands and providing some emergency storage
WTWs (3)	Beaufort West: Flocculation, Stabilisation, Filtration and Chlorination. Merweville only chlorination. Nelspoort Filtration and Chlorination. Murraysburg No treatment
Sewer Reticulation (143km)	Collecting sewerage (Exclude Murraysburg)
Sewer Pump Stations (6)	Pumping sewerage to WWTWs
WWTWs (4)	Beaufort West (Activated Sludge), Merweville, Nelspoort and Murraysburg (Oxidation dams)

Water Infrastructure: The current and depreciated replacement cost of the water infrastructure of Beaufort West Municipality, as included in their Asset Register, is summarised in the table below:

Table A.13: Current and depreciated replacement cost of the water infrastructure			
Asset Type	**CRC**	**DRC**	**% DRC/CRC**
Bulk Supply	R35 175 553	R16 343 697	46.5%
Bulk Water Pipelines	R62 296 802	R32 025 575	51.4%
Borehole	R1 055 905	R0	0.0%
Consumer Connections	R1 894 354	R863 031	45.6%
Water Pump Stations	R11 800 410	R8 102 018	68.7%
Reservoirs	R86 591 367	R22 686 756	26.2%
Water Pipeline	R80 001 746	R42 080 684	52.6%
WTW Beaufort West (WTW-001)	R10 476 729	R6 017 949	57.4%
WTW Nelspoort (WTW-002)	R1 469 488	R311 831	21.2%
WTW Nelspoort (WTW-003)	R1 079 592	R219 172	20.3%
WTW Merweville (WTW-004)	R147 968	R78 916	53.3%
Totals	**R291 989 915**	**R128 729 629**	**44.1%**

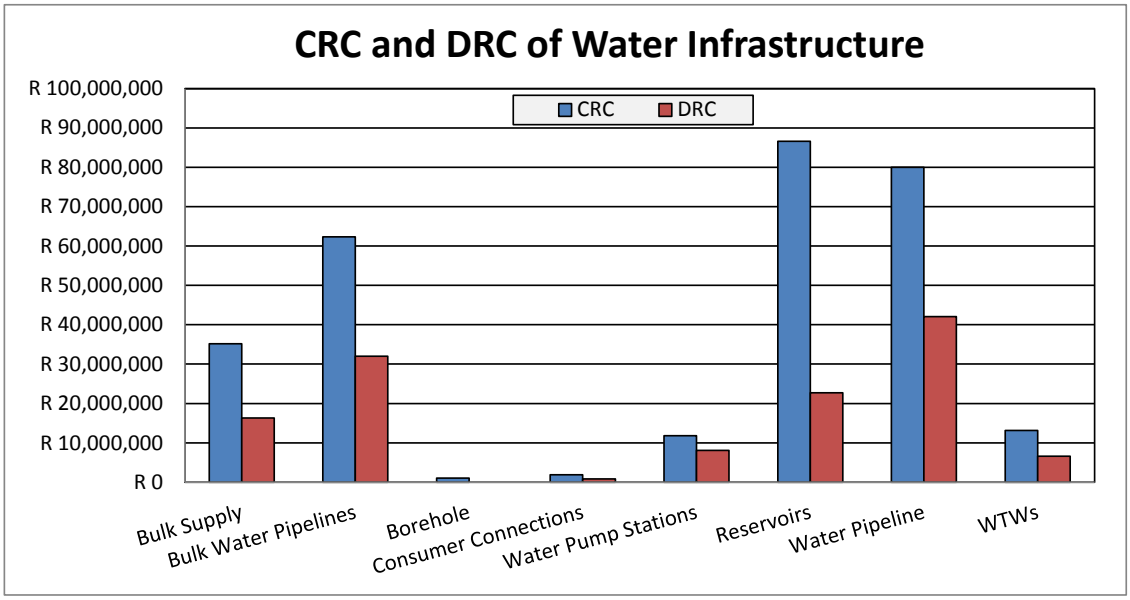


Figure A.3: CRC and DRC of the Water Infrastructure

The above table means that 55.91% of the value of the water infrastructure has been consumed.

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

Table A.14: Overview of the remaining useful life and age distribution by facility type for the water infrastructure (CRC)

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
RUL					
Bulk Supply	R8 844 484	R2 933 577	R3 086 987	R2 997 705	R17 312 799
Bulk Water Pipelines	R0	R15 576 848	R0	R1 472 000	R45 247 955
Borehole	R0	R0	R598 222	R0	R457 683
Consumer Connections	R0	R686 000	R1 027 710	R0	R180 644
Water Pump Stations	R3 496 758	R7 338 850	R0	R0	R964 802
Reservoirs	R61 255 438	R1 731 492	R0	R80 000	R23 524 438
Water Pipeline	R10 104 083	R0	R737 996	R0	R69 159 667
WTW Beaufort West (WTW-001)	R1 800 152	R288 880	R40 000	R30 000	R8 317 697
WTW Nelspoort (WTW-002)	R1 429 488	R0	R0	R40 000	R0
WTW Nelspoort (WTW-003)	R939 592	R0	R100 000	R40 000	R0
WTW Merweville (WTW-004)	R147 968	R0	R0	R0	R0
Totals	**R88 017 964**	**R28 555 647**	**R5 590 916**	**R4 659 705**	**R165 165 684**
Age distribution by Facility Type					
Bulk Supply	R8 774 924	R933 325	R2 379 527	R3 342 432	R19 745 346
Bulk Water Pipelines	R3 495 623	R132 800	R4 442 751	R8 819 794	R45 405 835
Borehole	R1 055 905	R0	R0	R0	R0
Consumer Connections	R1 894 354	R0	R0	R0	R0
Water Pump Stations	R6 784 490	R1 680 956	R1 510 225	R1 002 674	R822 065
Reservoirs	R965 564	R117 500	R0	R11 700	R85 496 603
Water Pipeline	R4 232 121	R13 195 430	R5 403 931	R1 315 734	R55 854 530
WTW Beaufort West (WTW-001)	R1 302 534	R4 520 000	R674 291	R1 445 861	R2 534 043
WTW Nelspoort (WTW-002)	R0	R67 000	R0	R0	R1 402 488
WTW Nelspoort (WTW-003)	R0	R214 592	R85 000	R100 000	R680 000
WTW Merweville (WTW-004)	R0	R0	R147 968	R0	R0
Totals	**R28 505 514**	**R20 861 603**	**R14 643 693**	**R16 038 194**	**R211 940 910**

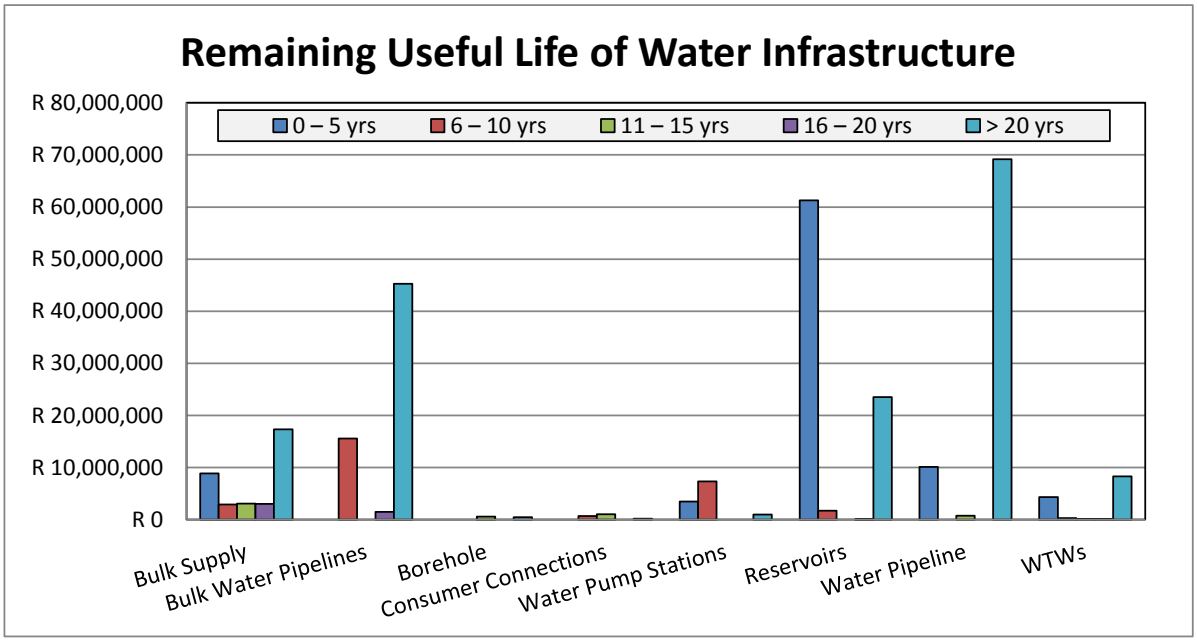


Figure A.4: Remaining Useful Life of the Water Infrastructure

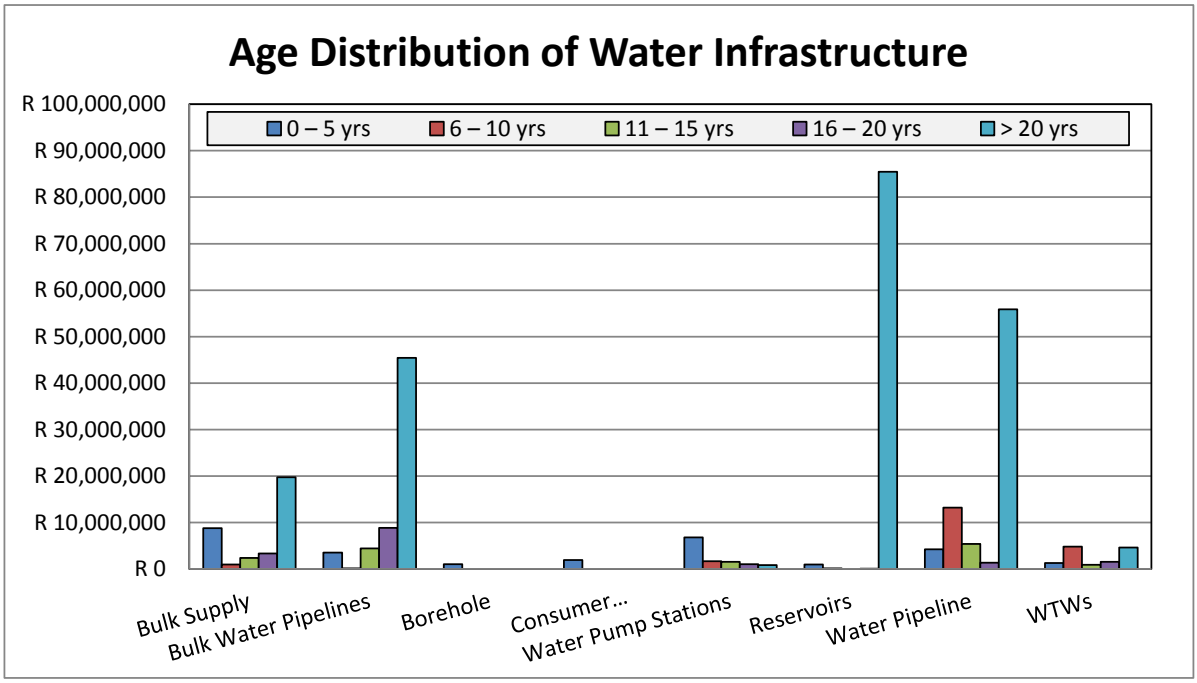


Figure A.5: Age distribution of the Water Infrastructure

The average water asset renewal needs over the next 10 years is R11.66 million per year and the reinvestment required is R88.018 million in the first 5 years and R28.556 million in the second 5 year period.

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

Table A.15: Condition grading per water facility type

Asset Type	Very Good	Good	Fair	Poor	Very Poor
Bulk Supply	R11 004 119	R3 846 476	R5 763 651	R13 654 662	R906 646
Bulk Water Pipelines	R12 555 760	R29 917 214	R4 246 980	R0	R15 576 848
Borehole	R1 055 905	R0	R0	R0	R0
Consumer Connections	R1 894 354	R0	R0	R0	R0
Water Pump Stations	R8 465 446	R0	R1 648 160	R1 344 739	R342 065
Reservoirs	R982 064	R20 971 759	R3 398 606	R61 238 938	R0
Water Pipeline	R24 147 216	R13 404 341	R32 346 106	R10 104 083	R0
WTW Beaufort West (WTW-001)	R5 822 534	R2 331 455	R607 999	R1 614 741	R100 000
WTW Nelspoort (WTW-002)	R27 000	R0	R40 000	R1 402 488	R0
WTW Nelspoort (WTW-003)	R174 592	R0	R135 000	R110 000	R660 000
WTW Merweville (WTW-004)	R0	R147 968	R0	R0	R0
Totals	**R66 128 989**	**R70 619 214**	**R48 186 503**	**R89 469 650**	**R17 585 559**

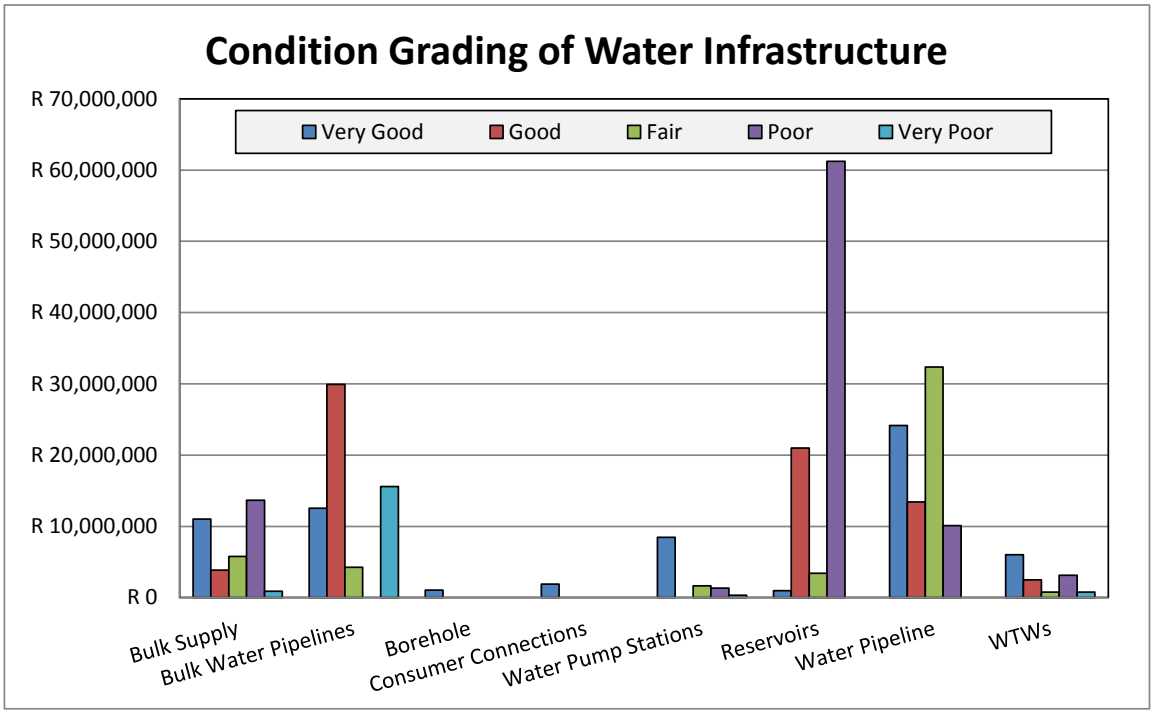


Figure A.6: Condition grading of water infrastructure

About 36.7% of the water supply infrastructure is in a poor or very poor condition and the condition backlog is in the order of R107.1 million. The bulk of the backlog is made up of bulk water pipeline, water reticulation pipeline and reservoir assets.

The risk category of all the “poor” and “very poor” assets per water facility are summarised in the table below:

Table A.16: Risk category of all the poor and very poor assets per water facility type

Asset Type	Significant	High	Moderate	Low
Bulk Supply	R2 405 229	R1 071 646	R11 084 433	R0
Bulk Water Pipelines	R0	R15 576 848	R0	R0
Borehole	R0	R0	R0	R0
Consumer Connections	R0	R0	R0	R0
Water Pump Stations	R342 065	R948 674	R396 065	R0
Reservoirs	R5 743 982	R0	R55 494 956	R0
Water Pipeline	R4 799 086	R0	R5 304 997	R0
WTW Beaufort West (WTW-001)	R250 000	R100 000	R1 364 741	R0
WTW Nelspoort (WTW-002)	R0	R0	R1 402 488	R0
WTW Nelspoort (WTW-003)	R560 000	R100 000	R110 000	R0
WTW Merweville (WTW-004)	R0	R0	R0	R0
Totals	**R14 100 362**	**R17 797 168**	**R75 157 679**	**R0**

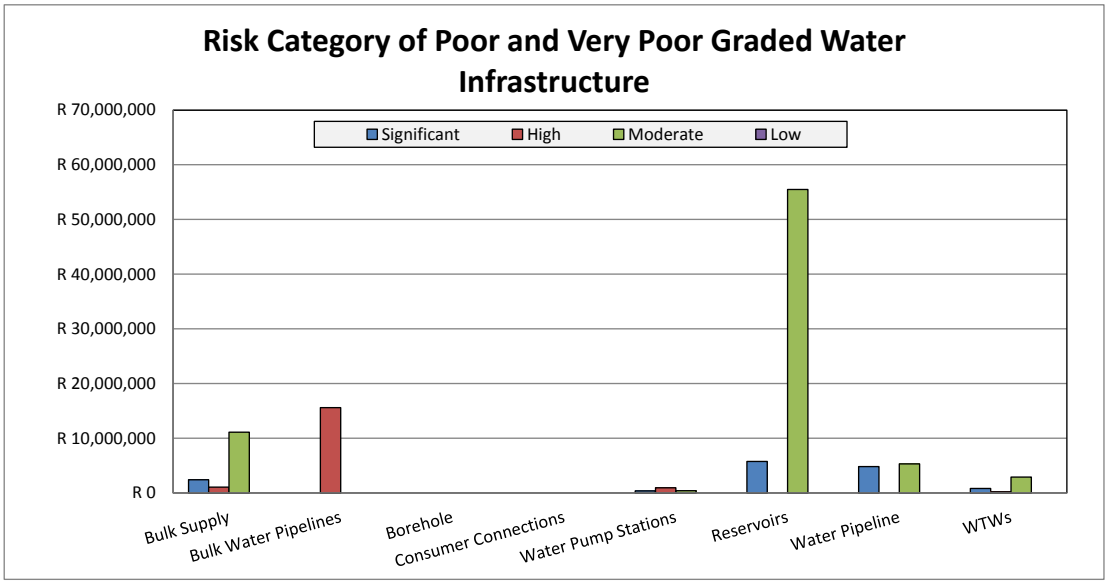


Figure A.7: Risk rating of poor and very poor graded water infrastructure

Sewerage Infrastructure: The current and depreciated replacement cost of the sewerage infrastructure of Beaufort West Municipality is summarised in the table below:

Table A.17: Current and depreciated replacement cost of the sewerage infrastructure

Asset Type	CRC	DRC	% DRC/CRC
Bulk Sewer Pipelines	R258 630	R250 009	96.7%
Sewer Pump Stations	R4 384 889	R1 029 442	23.5%
Sewer Pipelines	R5 249 610	R2 839 249	54.1%
Sewer Reticulation Pipelines	R75 385 560	R40 667 374	53.9%
Reclamation Plant (STW-01)	R24 344 308	R23 471 933	96.4%
Beaufort West WWTW (STW-001)	R18 064 619	R5 526 926	30.6%
Nelspoort WWTW (STW-002)	R431 378	R222 061	51.5%
Merweville WWTW (STW-03)	R2 008 015	R1 816 450	90.5%
Totals	**R130 127 009**	**R75 823 444**	**58.3%**

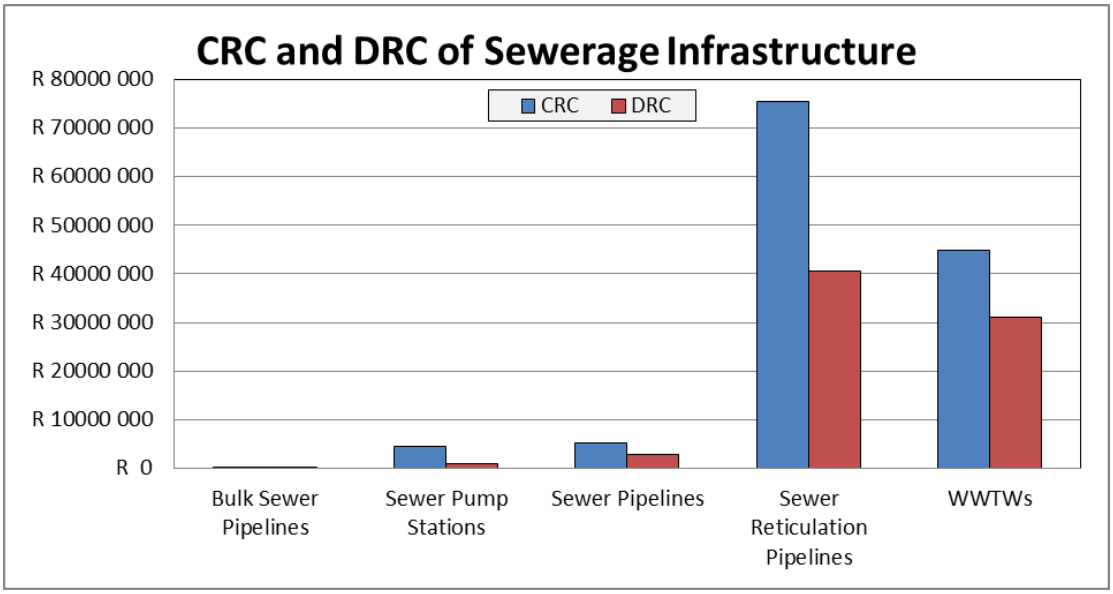


Figure A.8: CRC and DRC of the Sewerage Infrastructure

The above table means that 41.7% of the value of the sewerage infrastructure has been consumed.

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

Table A.18: Overview of the remaining useful life and age distribution by facility type for the sewerage infrastructure (CRC)					
Asset Type	**0 – 5 yrs**	**6 – 10 yrs**	**11 – 15 yrs**	**16 – 20 yrs**	**> 20 yrs**
RUL					
Bulk Sewer Pipelines	R0	R0	R 0	R 0	R 258 630
Sewer Pump Stations	R2 499 338	R73 348	R 571 744	R 75 000	R 1 165 459
Sewer Pipelines	R0	R0	R 0	R 0	R 5 249 610
Sewer Reticulation Pipelines	R0	R0	R 0	R 0	R 75 385 560
Reclamation Plant (STW-01)	R0	R0	R 0	R 10 980 093	R 13 364 215
Beaufort West WWTW (STW-001)	R5 076 115	R165 950	R 763 163	R 498 750	R 11 560 641
Nelspoort WWTW (STW-002)	R90 000	R0	R 341 378	R 0	R 0
Merweville WWTW (STW-03)	R125 000	R35 110	R 495 530	R 17 351	R 1 335 024
Totals	**R7 790 453**	**R274 408**	**R 2 171 815**	**R 11 571 194**	**R 108 319 138**
Age distribution by Facility Type					
Bulk Sewer Pipelines	R258 630	R0	R0	R0	R0
Sewer Pump Stations	R1 557 203	R610 228	R1 492 414	R586 044	R139 000
Sewer Pipelines	R5 249 610	R0	R0	R0	R0
Sewer Reticulation Pipelines	R2 371 393	R11 855 742	R5 768 063	R2 369 572	R53 020 790
Reclamation Plant (STW-01)	R24 344 308	R0	R0	R0	R0
Beaufort West WWTW (STW-001)	R878 163	R2 114 935	R0	R0	R15 071 521
Nelspoort WWTW (STW-002)	R0	R149 778	R0	R0	R281 600
Merweville WWTW (STW-03)	R1 802 146	R0	R205 870	R0	R0
Totals	**R36 461 452**	**R14 730 683**	**R7 466 346**	**R2 955 616**	**R68 512 911**

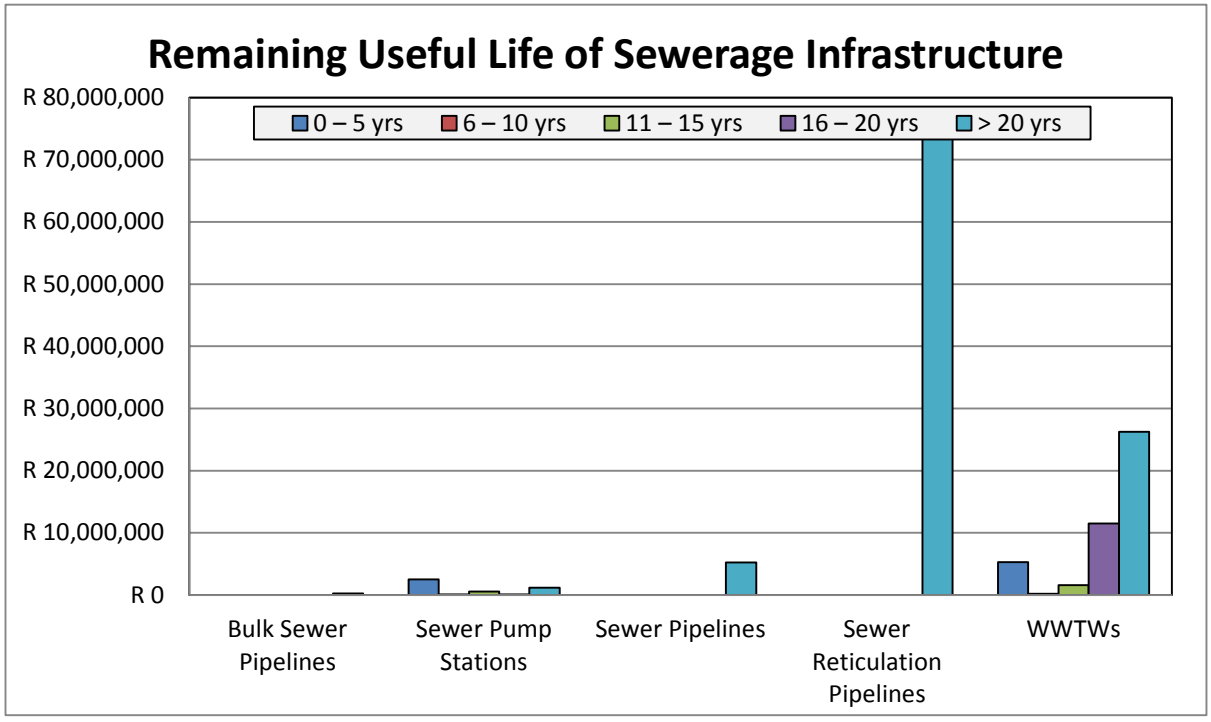


Figure A.9: Remaining Useful Life of the sewerage Infrastructure

The asset renewal needs for the sewerage infrastructure assets over the next 10 years is R0.806 million per year. The reinvestment required is R7.790 million in the first 5 years and R0.274 million in the second 5 year period. The age of 52.7% of the sewerage infrastructure assets is greater than 20 years.

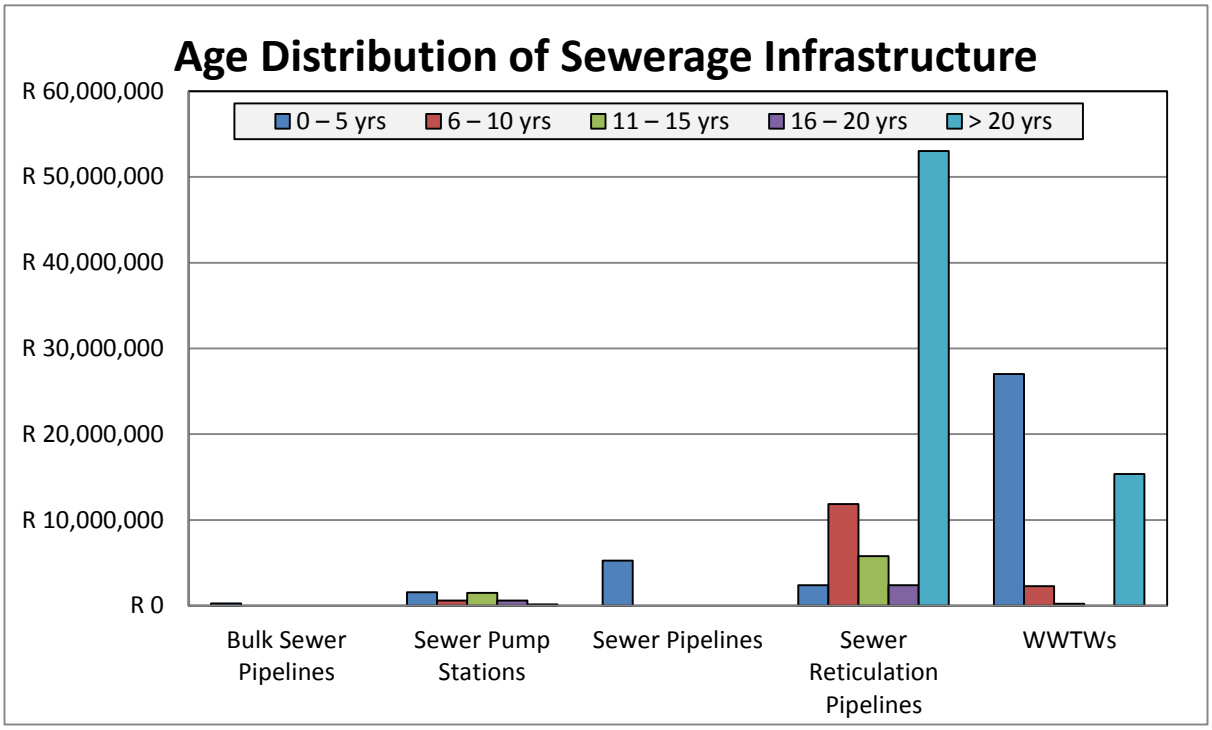


Figure A.10: Age distribution of the sewerage Infrastructure

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

Table A.19: Condition grading per sewerage facility type

Asset Type	Very Good	Good	Fair	Poor	Very Poor
Bulk Sewer Pipelines	R258 630	R0	R0	R0	R0
Sewer Pump Stations	R1 557 203	R1 409 870	R812 076	R455 044	R150 696
Sewer Pipelines	R5 249 610	R0	R0	R0	R0
Sewer Reticulation Pipelines	R20 460 971	R11 812 711	R36 690 820	R6 421 057	R0
Reclamation Plant (STW-01)	R24 344 308	R0	R0	R0	R0
Beaufort West WWTW (STW-001)	R1 420 538	R592 702	R13 945 522	R1 155 727	R950 130
Nelspoort WWTW (STW-002)	R59 778	R90 000	R281 600	R0	R0
Merweville WWTW (STW-03)	R1 796 615	R0	R211 400	R0	R0
Totals	**R55 147 654**	**R13 905 283**	**R51 941 418**	**R8 031 828**	**R1 100 826**

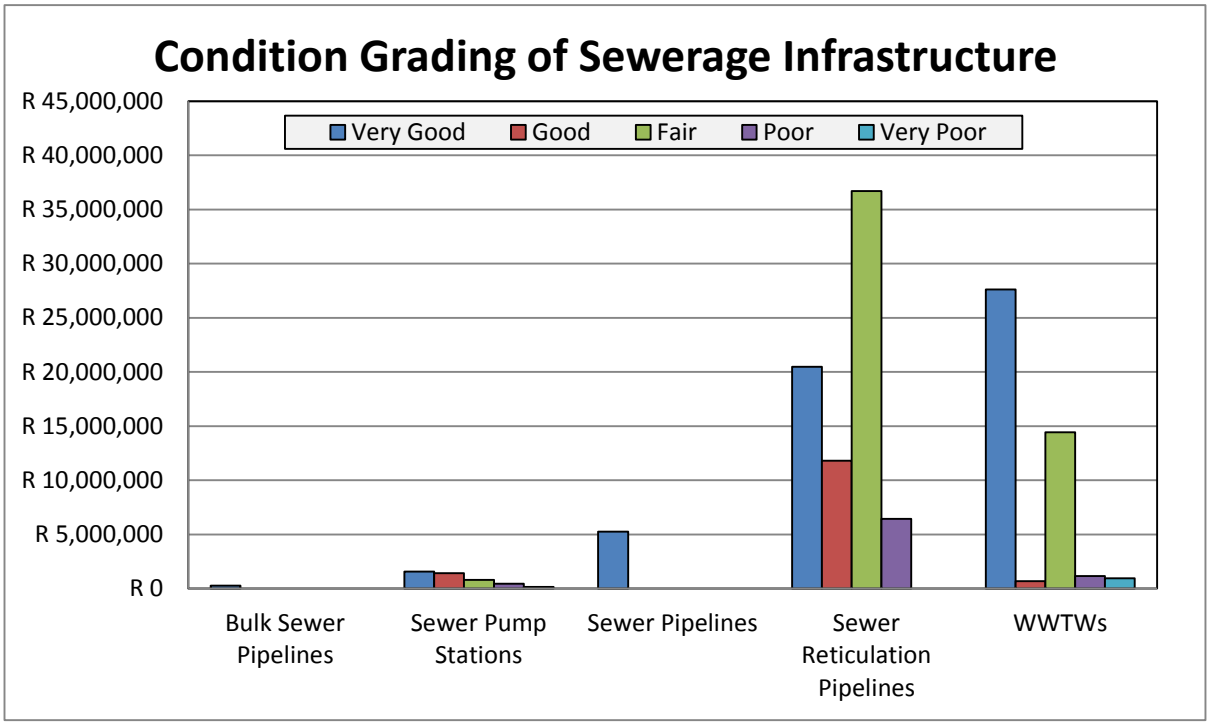


Figure A.11: Condition grading of sewerage Infrastructure

About 7.0% of the sewerage infrastructure is in a poor or very poor condition and the condition backlog is in the order of R9.133 million. The bulk of the backlog is made up of the sewer drainage networks.

The risk category of all the "poor" and "very poor" assets per sewer facility are summarised in the table below:

Table A.20: Risk category of all the poor and very poor assets per sewer facility type

Asset Type	Significant	High	Moderate	Low
Bulk Sewer Pipelines	R0	R0	R0	R0
Sewer Pump Stations	R146 696	R0	R459 044	R0
Sewer Pipelines	R0	R0	R0	R0
Sewer Reticulation Pipelines	R0	R0	R6 421 057	R0
Reclamation Plant (STW-01)	R0	R0	R0	R0
Beaufort West WWTW (STW-001)	R950 130	R0	R1 155 727	R0
Nelspoort WWTW (STW-002)	R0	R0	R0	R0
Merweville WWTW (STW-03)	R0	R0	R0	R0
Totals	**R1 096 826**	**R0**	**R8 035 828**	**R0**

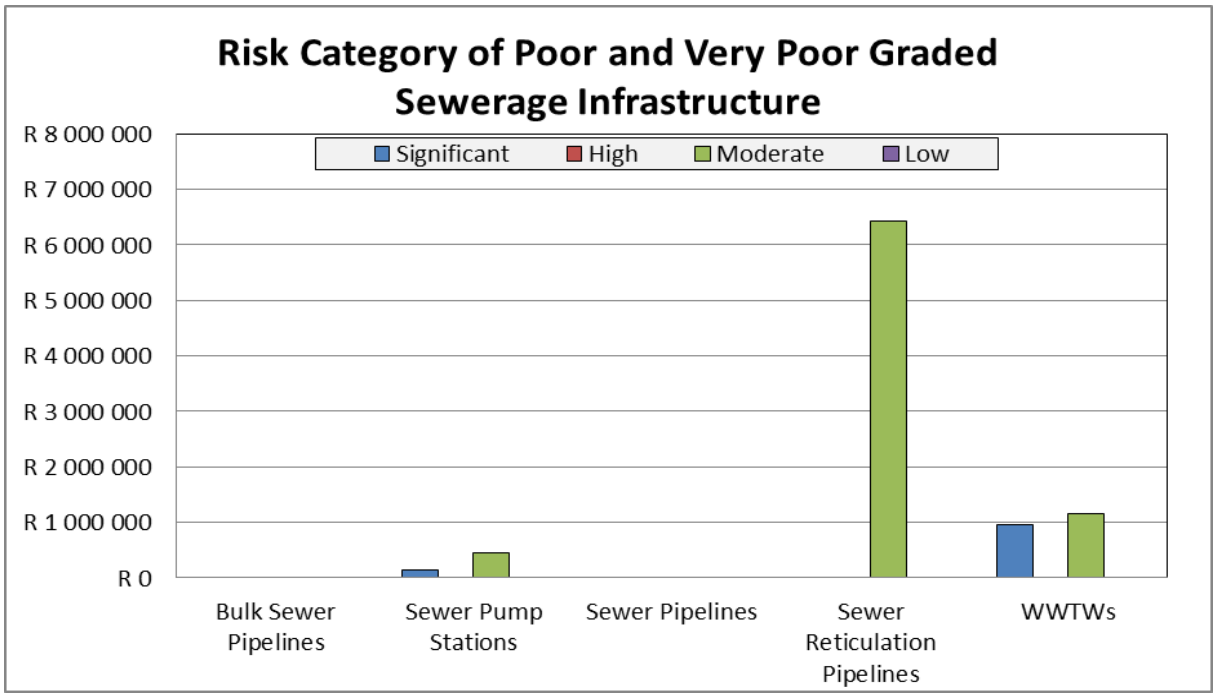


Figure A.12: Risk category of poor and very poor graded sewerage infrastructure

The asset renewal needs for the sewerage infrastructure assets over the next 10 years is R0.806 million per year. The reinvestment required is R7.790 million in the first 5 years and R0.274 million in the second 5 year period. The age of 52.7% of the sewerage infrastructure assets is greater than 20 years.

Business Element 6: Water Services Infrastructure Management (O&M)

Beaufort West Municipality drafted their first Water Safety Plan during 2009/2010. A qualified, dedicated team was established by Beaufort West Municipality to compile the Water Safety Plan. A detailed risk assessment was executed and the existing control measures implemented by Beaufort West Municipality were summarised. The impact of each of the hazards or hazardous events were characterised by assessing the severity of the likely health outcome and the probability of occurrence as part of the Water Safety Plan. This step of the Water Safety Plan establishes the risk that the water quality standard will not be met as well as the consequences if the standard is not complied with. An Improvement / Upgrade Plan was also developed for all the existing significant risks, where the existing controls were not effective or absent. Each identified improvement was linked to one of the Water Safety Plan Team members to take responsibility for implementation together with an appropriate time frame for implementation of these controls.

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

Operational and Compliance Water Quality Monitoring Programmes are implemented by Beaufort West Municipality. Operational sampling is done on a frequent basis by the treatment plant personnel at the various WTWs and analysed at the Beaufort West WTW's Laboratory.

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

An Incident Management Protocol (IMP) exists to guide Beaufort West Municipality's response to resolution and communication of drinking water quality failures (as defined according to the latest version of SANS 241). The objective of Beaufort West Municipality's IMP is to ensure that the failures are dealt with and are managed in an efficient and effective manner, using a consultative and transparent approach.

A W_2RAP for the various WWTWs is also in place. 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 W_2RAP team of Beaufort West Municipality is committed to meet regularly to review the implementation and all the aspects of the W_2RAP and to determine whether the field assessments need updates or modifications and whether the Incident Response Management Protocol is still adequate. A set of Compliance Alert Levels, corresponding to the requirements of the General Standard (at present), is also in place.

Operational Waste Water Samples of Beaufort West Municipality are analysed at the Municipality's own laboratory at the Beaufort West WTW. On completion of the analysis of the wastewater samples received at the laboratory, the raw data is entered in a spreadsheet at the Engineering Department. Any final effluent samples that do not comply with the target values (corresponding to the requirements of the General Standard) are noted and Mr Wright is notified. Mr Wright then contact the relevant supervisor and / or process controller of the relevant WWTWs to inform them of the non-compliance, and the reason for this should be investigated and reported on.

The final effluent quality compliance sample results are loaded onto the GDS, which indicate the compliance performance for the month for each of the WWTWs, which specific indication of samples that does not comply.

DWS's Blue Drop Process

The DWS launched the blue and green drop certification, with regard to drinking water quality and wastewater quality management, 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 six 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 Beaufort West Municipality is summarised as follows in the DWS's 2014 Blue Drop Report:

Table A.21: Blue Drop Performance of the Municipality (DWS's 2014 Blue Drop Report)

Municipal Blue Drop Score	2011 – 92.01%, 2012 - 94.91%, 2014 - 89.52%

Regulatory Impression: Even with a small management team, the Beaufort West Local Municipality officials were well prepared for the Blue Drop audit. Once again the Beaufort West water supply system scored very well and managed to maintain the coveted Blue Drop Status for a fourth consecutive year. Although a significant decline in the overall municipal score is noted, this is largely due to the inclusion of the Murraysburg supply system, which was transferred from the Central Karoo District Municipality during 2011/12. Information for the Murraysburg system was not readily available. It is however commendable that key requirements to bring this system up to standard, such as water quality monitoring programmes and water safety planning have been introduced, and already there is a marked improvement from the 11.5% achieved in 2011. The Municipality is encouraged to extend the level of excellence demonstrated for the Beaufort West system to the remaining systems.

The Municipality has implemented a strong water safety planning process through which the Water Safety Plan is updated regularly. The Municipality is encouraged to ensure that comprehensive Risk Assessment is undertaken for all systems to address all potential risks.

The Municipality is further commended on ensuring excellent microbiological compliance across all systems, which is a marked improvement from the previous audit. Attention however needs to be given to the chemical compliance in Merweville, Murraysburg and Nelspoort where chemical monitoring frequency needs to be improved. In addition, it is noted that failures reported from a single full SANS analyses data set, were not further investigated through re-sampling.

Supporting programmes require attention, especially the Incident Management Protocol and implementation at all systems. Works and Process controller registration at Beaufort West is very good, but this cannot be said about the other systems. The Municipality needs to pay more attention to bring the management of the smaller systems up to the level achieved at Beaufort West.

Management commitment of this Municipality is strong and this is supported through strong asset management. Beaufort West is one of the few municipalities that provided a No Drop Water balance per system with a strong Water Conservation and Demand Management Strategy, which is being implemented. The Murraysburg system however needs to be prioritised as no information was available.

Site Inspection Score for Beaufort West WTW (86%) and associated network (93%): The Beaufort WTW and associated network were inspected to verify the Beaufort West Local Municipality Blue Drop findings.

The site inspection at the Beaufort West WTW and network was considered to be very good. Areas for improvement include:

- While safety equipment is available on-site, the condition of the equipment needs to be monitored more effectively to ensure the safety of process controllers.
- Backup blower and backwash pump not installed.
- The sludge lagoon was overgrown with grass.
- Implementation of a preventative network maintenance plan and documented reservoir cleaning schedule.

Table A.21: Blue Drop Performance of the Municipality (DWS's 2014 Blue Drop Report)				
Performance Area	**Beaufort West**	**Merweville**	**Murraysburg BWM**	**Nelspoort**
Water Services Provider(s)	**Beaufort West LM**	**Beaufort West LM**	**Beaufort West LM**	**Beaufort West LM**
Water Safety Planning	31.68	26.95	12.78	25.03
Treatment Process Management	8.00	5.16	3.20	4.00
DWQ Compliance	30.00	20.55	15.90	16.50
Management Accountability	10.00	8.50	5.95	8.50
Asset Management	11.83	11.83	3.78	11.10
Use Efficiency, Loss Management	2.82	3.00	0.00	2.82
Bonus Scores	0.89	2.34	6.75	2.16
Penalties	0.00	0.00	0.00	0.00
Blue Drop Score (2014)	**95.22%**	**78.33%**	**48.36%**	**70.10%**
Blue Drop Score (2012)	96.27%	86.43%	N/A	74.45%
Blue Drop Score (2011)	95.44%	79.71%	N/A	61.21%
Blue Drop Score (2010)	95.00%	86.25%	N/A	70.13%
System Design Capacity (Ml/d)	12.400	4.500	0.600	0.400
Operational Capacity (% i.t.o. Design)	44%	6%	100%	42%
Average daily consumption (l/p/d)	148.6	228.2	140.9	51.6
Microbiological Compliance (%)	**99.9%**	**99.9%**	**99.9%**	**99.9%**
Chemical Compliance (%)	**99.5%**	**93.3%**	**53.3%**	**46.7%**

Table A.22: DWS's 2014 Blue Drop Risk Ratings for the various systems				
Municipal Blue Drop Risk Rating				**21%**
The overall 2014 Risk Rating for Beaufort West is 21% which translates into the 3rd best performance in the Western Cape. Note that this value is based on the 3 specific areas indicated below and shows concerns (medium to critical risks) for Process Control (which risks reflect compliance in terms of draft Regulation 813) in 3 of the 4 systems; Drinking Water Quality in none of the 4 systems; and Risk Management in none of the 4 systems. Risk Ratings for Drinking Water Quality and Risk Management were found to be very low.				
Assessment Area	**Beaufort West**	**Merweville**	**Murraysburg BWM**	**Nelspoort**
2014				
Blue Drop Risk Rating (2014)	**16.2%**	**37.1%**	**46.8%**	**51.3%**
Process Control RR	37.2%	60.0%	60.0%	62.2%
Drinking Water Quality RR	11.1%	40.7%	40.7%	40.7%
Risk Management RR	13.0%	13.0%	30.4%	21.7%
2013				
Blue Drop Risk Rating (2013)	**40.9%**	**33.5%**	**N/A**	**48.8%**
Process Control RR	53.5%	60.0%	N/A	62.2%
Drinking Water Quality RR	11.1%	11.1%	N/A	11.1%
Risk Management RR	30.4%	60.9%	N/A	60.9%
2012				
Blue Drop Risk Rating (2012)	**82.6%**	**40.8%**	**N/A**	**73.7%**
Process Control RR	81.4%	77.1%	N/A	78.4%
Drinking Water Quality RR	14.8%	11.1%	N/A	40.7%
Risk Management RR	13.0%	65.2%	N/A	65.2%

DWS's Green Drop Process

The DWS also completed their Third Order Assessment of Municipal Waste Water Treatment Plants, DWS's Green Drop Report for 2013, 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 Beaufort West Municipality is summarised as follows in the DWS's 2013 Green Drop Report.

Table A.23: Green Drop Performance of the Municipality (DWS's 2013 Green Drop Report)

Average Green Drop Score	2009 – 43.00%, 2011 – 89.50%, 2013 - 79.55%

Regulatory Impression: The Beaufort West team is maintaining an impeccable record and is performing at peak, with one Green Drop Certificate and two-near misses on Certification. The team's preparation was exemplary, with special reference to the commitment of the Technical Director and Mrs de Bod, as well as the extended time offered to finalise the audits. The inspection panel remarked; "... the municipal team knows their business and display a positive attitude towards the employer..."

Regrettably, the low score awarded for the Murraysburg system, resulted in an overall decrease in the municipal Green Drop score 89.5% to 79.6%. The Regulator notes that the overall score would have exceeded 90% had it not been for the Murraysburg system. Improved scores are noted for all systems in both Green Drop- and risk rating CRR scores, with all plants now residing in low and moderated risk space, with the exception of Murraysburg which is at a concernable critical risk position. The systems are carrying forward the gains of the 2011 findings, but further work needs to be done in the areas of risk management, treatment capacity and planning, and asset management. The Murraysburg plant was transferred to the WSA from the District Municipality in July 2011, with some human resource and budget matters that need to be resolved. The Regulator therefore understands the predicament, but have full confidence that Beaufort West will elevate the status of the added plant in the next Green Drop cycle.

The Regulator is not satisfied with the performance of wastewater services in ALL the Murraysburg system. The WSA is to submit Corrective Action Plans to DWS within 30 days of release of the Green Drop Report.

Green Drop findings:

1. The Murraysburg system is failing on all 8 Green Drop criteria, of which the lack of design capacity, flows and chemical physical compliance monitoring is most prominent.
2. The Merweville and Nelspoort plants can improve on the technical skills and registration against Regulation 17, as well as some gaps find in the operational logbook (Merweville) records and maintenance manual (Nelspoort), as well as a lack of adequate training and knowledge transfer events.
3. Good work has been done in terms of W_2RAP development, but implementation and resources to support implementation remains a concern.
4. Three of the plants do not have (verifiable) flow records or have reached their design capacity, placing these plants at high risk and creating an uncertainty regarding forward planning. Problems experienced with flow meters are noted and risk mitigation measures need to be elevated to resolve these as they occur.

GREEN DROP REPORT CARD

Key Performance Area	Beaufort West	Merweville	Nelspoort	Murraysburg
Process Control and Maintenance Skills	99	72	74	28
Monitoring Programme	98	100	90	37
Submission of Results	100	100	100	0
Effluent Quality Compliance	100	100	95	0
Risk Management	82	82	82	0
Local Regulation	100	100	100	40
Treatment Capacity	70	42	83	0
Asset Management	81	72	78	10
Bonus Scores	1.97	1.45	2.16	3.60
Penalties	0.68	0.00	0.38	3.00
Green Drop Score (2013)	**93.73%**	**88.70%**	**89.08%**	**12.45%**
Green Drop Score (2011)	**90.70%**		**87.90%**	**NA (0%)**
Green Drop Score (2009)	**83.00%**	**20.00%**	**26.00%**	**NA (0%)**
System Design Capacity (Ml/d)	4.600	0.039	0.160	NI
Capacity Utilisation (% ADWF i.t.o. Design Capacity)	50.74%	NI (151.00%)	100.00%	NI (151.00%)
Resource Discharged into	No discharge, effluent reuse for irrigation and reclamation	No discharge	No discharge	Overflow to field 400m from Buffels river
Microbiological Compliance	100.00%	NMR	NMR	83.33%
Chemical Compliance	95.97%	NMR	NMR	0.00%
Physical Compliance	100.00%	NMR	NMR	0.00%
Overall Compliance	98.08%	NMR	NMR	10.42%

Table A.23: Green Drop Performance of the Municipality (DWS's 2013 Green Drop Report)				
Wastewater Risk Rating (2012)	**35.30%**	**23.50%**	**29.40%**	**NA (100%)**
Wastewater Risk Rating (2013)	**23.53%**	**58.82%**	**64.71%**	**94.12%**

The 2014 Green Drop Risk Profile Progress Report of the DWS 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 1 July 2012 – 30 June 2013, which represents the year immediately following the Green Drop 2013 assessment period. The results for Beaufort West Municipality were summarised as follow in DWS's 2014 Green Drop Risk Profile Progress Report.

Table A.24: DWS's 2014 Green Drop Risk Profile Progress Report results for Beaufort West Municipality				
Technology Description	**Beaufort West**	**Merweville**	**Nelspoort**	**Murraysburg**
Technology (Liquid)	Activated sludge and Biological filters	Evaporation ponds (no effluent)	Evaporation ponds (no effluent)	Evaporation ponds (no effluent)
Technology (Sludge)	Sludge lagoon/pond	None specified	None specified	None specified
Key Risk Areas				
ADWF Design Capacity (Ml/d)	4.600	0.039	0.170	0.400
Operational flow (% of Design Capacity)	50%	51%	100%	151% (NI)
Annual Average Effluent Quality Compliance (2012-2013)	94.8%	NMR	NMR	NMR
Microbiological Compliance (%)	100.0%	NMR	NMR	NMR
Physical Compliance (%)	100.0%	NMR	NMR	NMR
Chemical Compliance (%)	89.6%	NMR	NMR	NMR
Technical skills (Reg. 813)	Yes	Partial	Partial	Partial
2014 Wastewater Risk Rating (%CRR/CRR$_{max}$)	**29.4%**	**35.3%**	**35.3%**	**47.1%**
2013 Wastewater Risk Rating (%CRR/CRR$_{max}$)	35.3%	58.8%	64.7%	94.1%
Risk Abatement Planning				
Highest Risk Areas based on the CRR	Chemical Compliance	Technical skills	Technical skills	Operational flow exceeding design capacity, technical skills
WW Risk Abatement Status	Final document (approved by Council)	Final document (approved by Council)	Final document (approved by Council)	In planning stage
Capital & Refurbishment expenditure for Fin Year 2012-2013 (Rand)	R0.65m	None	None	None
Description of Projects' Expenditure 2012-2013	Additional screw pump	No capital projects	No capital projects	No capital projects
W$_2$RAP Abatement Document and Status Commentary	The W$_2$RAP were provided for each of the wastewater systems at Beaufort West, Merweville and Nelspoort. Documents dated September 2012 and developed for the period 2011/2012. Note that the review period is 2012/13. A multi-disciplinary team participated (senior management, operational support staff, consulting engineers, environmental scientists and representative from Gamka Dam Catchment. A risk assessment (acceptable methodology) was done for wastewater treatment. • Beaufort West: Highest risks identified were deterioration in the quality of final effluent water due to process failure / problems; intake screws damaged or malfunctioning leading to long downtime; inadequate flocculants and settling. Control measures identified for each hazardous event. No monitoring of control measures in place. No results for verification of effluent quality to ensure that the W$_2$RAP is being implemented correctly and is achieving the performance required to meet standards. • Merweville: risks were identified, poor quality water from final pond, short circuiting in ponds – partial treatment, pump failure at pump station leading to downtime. Monitoring action plan completed for each risk – Feb 2013 and 2013/14 financial year. Nelspoort: 8 hazardous events were identified, some are that capacity of the works is not sufficient for needs, eroded dam walls and structural problems with embankments, overloading of ponds leading to obnoxious odors, illness or drowning in unfenced pond systems. Monitoring action plan completed for each risk – dates vary between Feb 2013 and immediate and ongoing.			

Regulatory Impression

Beaufort West LM achieved a Green Drop for the Beaufort West wastewater system in the last GD assessment reported in 2013. The WSA is congratulated with this achievement and for the sterling performance by this accomplished team. The Nelspoort and Merweville systems achieved 89.1% and 88.7%, respectively in the same assessment. It seems likely that GD Verification may be within reach for the 2015 GWSA. These system have shown significant improvement since the Green Drop assessments commenced in 2009 and the Municipality is commended for this sustainable effort. The Murraysburg system was transferred from the district municipality to the Beaufort West Municipality in 2009 and this system has shown significant improvement since then.

The CRR analysis indicates that all 4 treatment plants improved upon their 2013 risk ratios. The most remarkable improvement was evident for the Murraysburg system, where the CRR improved from 94.1% to 47.1%. Well done. Risk factors that are deserving of further improvement include the effluent quality in the Beaufort West and Merweville systems (also identified as risks in the respective W_2RAPs), as well as supervisory and process operator skills. Attention should also be given to the design capacity in Nelspoort and measuring operational flows in Murraysburg.

The Regulator encourages the municipality to strive for continued improvement, and to target 4 Green Drop Certifications and 4 low risk CRRs during the upcoming Green Drop audit 2015.

Business Element 7: Associated Services

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

Business Element 8: Conservation and Demand Management

Beaufort West Municipality has made significant progress in implementing specific WC/WDM interventions. A detailed water meter audit was carried out during 2008/2009. A Long Term WC/WDM Strategy was further developed for Beaufort West Municipality during June 2011, with funding support from the DWS. The WC/WDM Strategy was taken to Council on the 14th of November 2012. A four block step tariff system is implemented by the Municipality, which discourage wasteful or inefficient use of water. The Municipality continued with the further implementation of Pressure Management measures in the Beaufort West distribution system, which was started in 2010.

The existing NRW for the various distribution systems are very high and it is estimated that it is as a result of the billing system. The Municipality replaced various prepaid water meters over the last financial year in order to ensure that their future consumption is registered through the financial system. The water losses on the bulk distribution system, which include the treatment losses, were less than 6% for the last financial year. The high losses are on the internal distribution system, due to inaccurate billing records and the pre-paid metering system used for the free water. The completion of the new billing system will ensure accurate communication between the individual meters and the Municipality's Financial System.

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

- Development of a Long-Term WC/WDM Strategy, with funding support from the DWS.
- Meter and record all bulk water supply, improve quality of data regarding monthly consumer use and implement district metered areas (Water Balances are carried out).
- Implement a four block step water tariff structure that promotes the efficient use of water and discourage wastages.
- Completed a detail water meter audit for Beaufort West, Merweville and Nelspoort, where all the bulk and consumer water meters were surveyed. Regularly checking all consumer water meters, in order to remove all illegal connections.

- Implementation of pressure management in Beaufort West (Four phases, with three phases completed).
- Upgrading of the water telemetry system in order to prevent any reservoirs from overflowing.

Beaufort West Municipality's Long-Term WC/WDM Strategy, which was approved by Council, includes the following key focus areas:

- Reduce and maintain low levels of water losses through the reticulation system.
  - Reduce and maintain low levels of water losses through Active Leak Control of the reticulation system
  - Reduce and maintain low levels of water losses through pressure management of the reticulation system
  - Rehabilitation and replacement of components of the network system
  - Preventative maintenance
  - Passive Leak Control
  - Develop a uniform O&M Policy
- Reduce and maintain low levels of water wastage and inefficient water demand by existing consumers.
  - Implement water tariffs that promote WC&DM
  - Educate consumers to reduce water wastage and inefficient use
  - Regulation to prevent water wastage and inefficient usage and enforcement of penalties for water wastage
  - Comprehensive water projects in low income areas
  - Promote and assist domestic consumers to undertake water audits
  - Plumbing retro-fit programme
  - Water-wise gardening scheme
  - Support Programme for Large Consumers (Including Government)
  - Monitor consumers and inform them of large deviations
  - Reduction of water demand by Municipal Departments
- Increase use of alternative water resources.
  - Educate consumers to increase the use of alternative sources
  - Regulation that promotes alternative sources
  - Promote Grey-water recycling
  - Promote Consumer Boreholes
  - Promote Rainwater harvesting
  - Increase the volume of treated effluent re-use supplied by municipality
- Ensure the efficient use of water in new developments.
  - Regulation and enforcement to prevent water wastage and promote alternative sources
  - Provide incentives for developers
  - Develop new engineering standards
  - Incentives to new consumers to minimise inefficient use
  - Develop plumbing standards, particularly for low cost housing
- Ensure and maintain adequate information / policies to support decision making.
  - Management Information Systems (MIS)
  - Establish District Management Areas and Zones (Including metering and logging)
  - Undertake regular water balance
  - Upgrade the telemetry system
  - End-use and consumer behaviour research
  - Development of decision-making policies on WC/WDM

- Ensure all decisions are supported by integrated water resource planning (IRP).
  - Ensure the use of IRP principles for water resource planning
  - On-going review of the impact of WC/DM on proposed new bulk infrastructure
- Ensure adequate financial resources and processes to finance WC&WDM and minimise commercial and metering losses.
  - On-going revision of tariffs and tariff structure to promote WC/WDM while at the same time ensuring adequate financial resources.
  - Introduce informative billing
  - Commercial data validation
  - Meter Management / Replacement Program
  - Management of meter readings
  - Resolve billing exception reports
  - Management of large consumer meters
  - Reduction of illegal connections
  - Establishment of WC/DM fund
  - Seek funding and joint ventures
- Ensure adequate human resources and human resource processes.
  - Development of suitable component of human resources to implement WC/DM
  - Development of WC/WDM working procedures and responsibilities
- Ensure adequate stakeholder buy-in and commitment.
  - Political and management buy-in
  - Partnerships and cooperation with other institutions
  - Public Participation
- Monitor the impact of WC/WDM measures and KPIs.
  - Monitor the impact of WC/WDM measures
  - KPIs and Benchmarks on WC/WDM
  - Adapt Policies, Strategies and Programmes as more information becomes available.

The table below gives a summary of the NRW for the various distribution systems in Beaufort West Municipality's Management Area.

Table A.25: Non revenue water and ILI for the various distribution systems

Description	Unit	14/15	Record : Prior (Ml/a)			
			13/14	12/13	11/12	10/11
Beaufort West	Volume	1 261.822	1 196.249	1 229.356	1 040.564	705.594
	Percentage	49.7%	50.3%	49.7%	48.7%	42.5%
	ILI	5.54	5.35	6.08	5.15	3.61
Merweville	Volume	48.906	42.797	17.063	16.177	5.322
	Percentage	43.1%	41.9%	18.4%	18.3%	7.7%
	ILI	13.90	12.23	5.03	4.32	1.98
Nelspoort	Volume	89.556	80.903	67.251	51.672	21.761
	Percentage	67.3%	64.0%	58.4%	45.3%	21.0%
	ILI	9.24	8.34	7.37	5.65	3.68
Murraysburg	Volume	Bulk water meter readings not yet available				
	Percentage					
	ILI					
TOTAL	**Volume**	**1 400.284**	**1 319.949**	**1 313.670**	**1 108.413**	**732.677**
	Percentage	**50.29%**	**50.64%**	**49.02%**	**47.39%**	**39.96%**
	ILI	6.01	5.76	6.32	5.32	3.71

Notes: 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.
The graph below gives an overview of the water meters replaced or repaired by Beaufort West Municipality for the various financial years.

The percentage NRW for Beaufort West, Merweville and Nelspoort can be summarised as follows:

Beaufort West: The total percentages of NRW (Bulk and network) for Beaufort West were very high at 53.1% for 2013/2014 and 52.0% for 2014/2015. The treatment losses were good at 5.7% for 2013/2014 and 1.1% for 2014/2015. The percentages of NRW for the groundwater bulk distribution pipelines were also low at 4.7% for both 2013/2014 and 2014/2015. The percentages NRW for the internal network were however very high for the last number of financial years at 50.3% for 2013/2014 and 49.7% for 2014/2015. It is estimated that the billed metered consumption, as received from the Finance Department, for Beaufort West is not correct and more specific the volume of prepaid water sold and the volume of free basic water.

Merweville: The total percentages of NRW (Bulk and network) in Merweville were 47.4% for 2013/2014 and 45.3% for 2014/2015. The percentage bulk distribution NRW was reduced from 9.4% for 2013/2014 to 3.9% for 2014/2015. The percentage NRW for the internal network however increased from 41.9% for 2013/2014 to 43.1% for 2014/2015. It is estimated that the billed metered consumption and the volume of free basic water, as received from the Finance Department, is not correct and that the high percentage of network distribution NRW are not real losses.

Nelspoort: The total percentage of NRW (Bulk and network) in Nelspoort is very high at 71.4% for 2013/2014 and 74.8% for 2014/2015. The percentage bulk distribution NRW however increased from 20.4% for 2013/2014 to 23.1% for 2014/2015. It is also estimated that the billed metered consumption and the volume of free basic water, as received from the Finance Department, is not correct and that the high percentage of network distribution NRW are not real water losses.

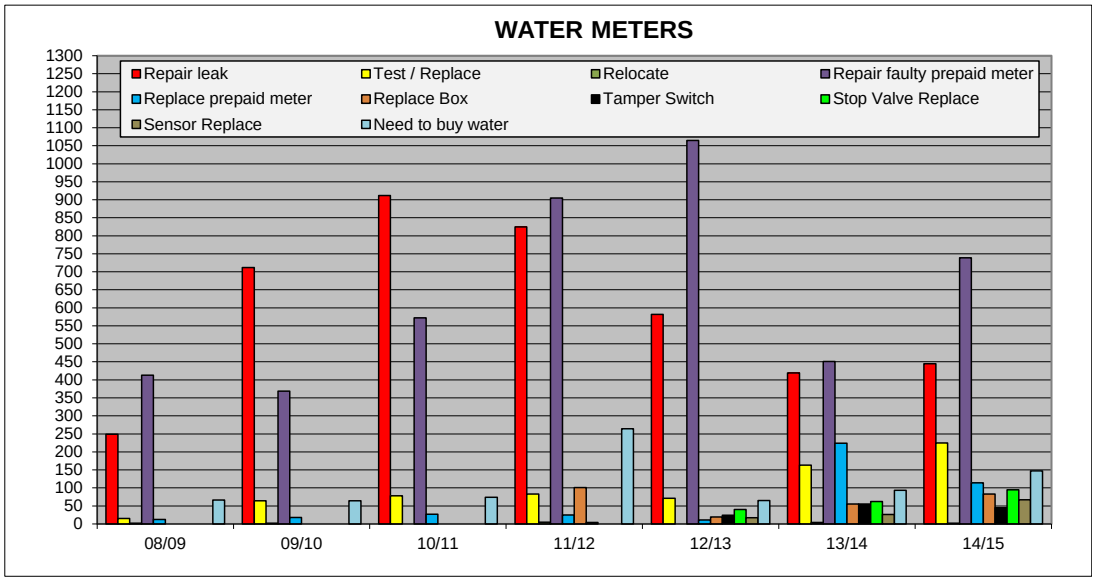


Figure A.13: Water Meters replaced or repaired by Beaufort West Municipality

Business Element 9: Water Resources

The graph below gives an overview of the total bulk water supply for the various distribution systems in Beaufort West Municipality's Management Area.

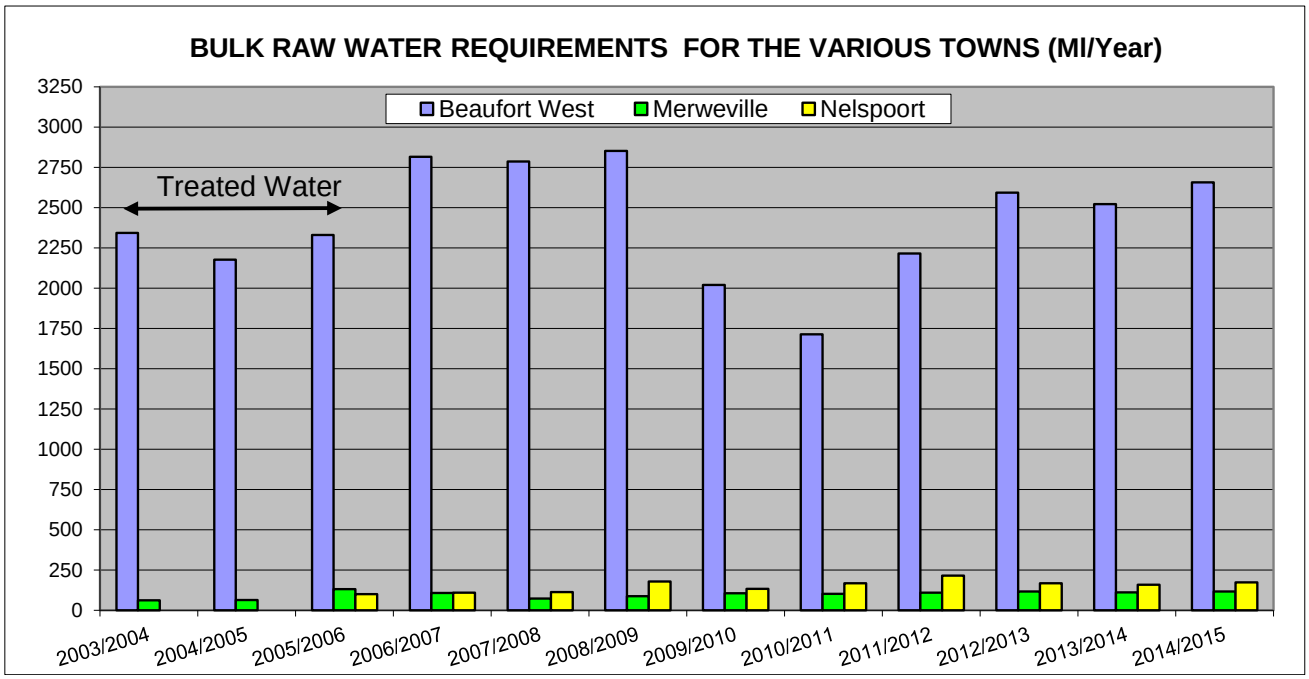


Figure A.14: Bulk raw water requirements for the various towns

Table A.26: Bulk water supply to the various towns

Distribution System	Source	14/15	Record : Prior (Ml/a)					
			13/14	12/13	11/12	10/11	09/10	08/09
Beaufort West	Groundwater, Surface water and Reclamation plant.	2 656.491	2 521.138	2 593.877	2 215.273	1 714.082	2 019.598	2 851.536
Merweville	Groundwater	118.123	112.654	116.709	110.190	101.731	105.630	87.172
Nelspoort	Groundwater and Sout River	173.157	158.836	167.816	215.657	168.083	134.470	178.669
Murraysburg	Groundwater	Bulk meter readings not yet available						
Total		**2 947.772**	**2 792.628**	**2 878.402**	**2 541.120**	**1 983.884**	**2 259.698**	**3 117.377**

All the surface and groundwater sources are all supplied with bulk water meters, which are read weekly by the Beaufort West Municipality's personnel and is a valuable source of information in terms of the water balances for the various distribution systems.

Beaufort West – The town is supplied with surface water from the Gamka Dam, groundwater from various production boreholes and potable water from the Beaufort West Reclamation Plant, where secondary treated water from the Beaufort West WWTW is further treated to potable standards. The graph below gives an overview of the annual raw water supply to Beaufort West from the various water resources.

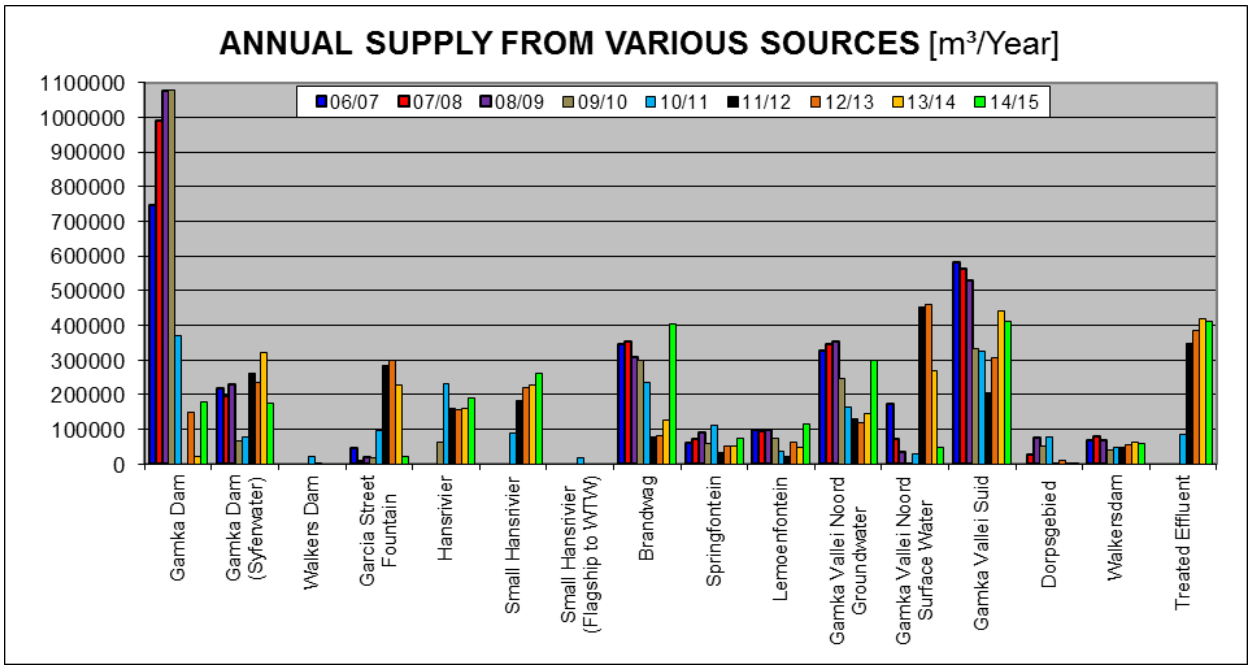


Figure A.15: Annual raw water supply to Beaufort West from the various resources.

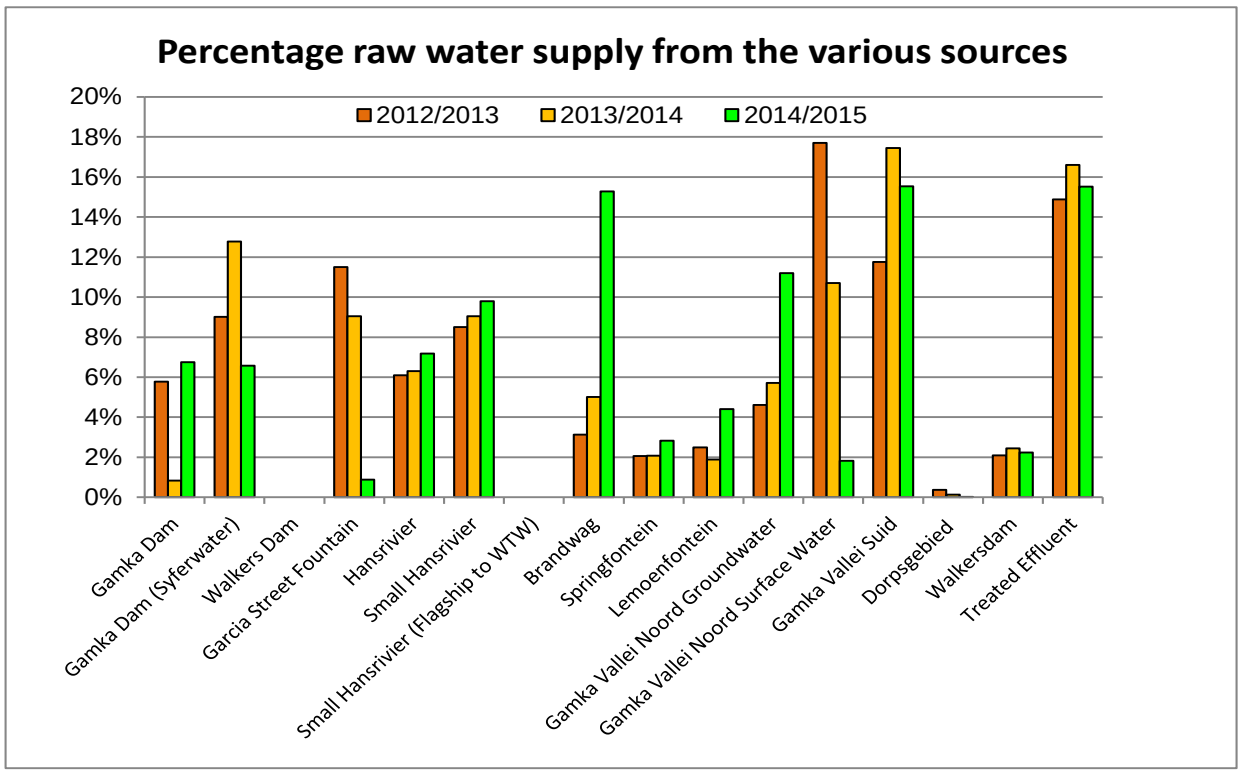


Figure A.16: Percentage raw water supply to Beaufort West from the various resources for the last three financial years.

Beaufort West Municipality experienced serious problems with drought conditions during 2009-2011 impacting on the security of water supply to its consumers. The drought period has seen the water levels in the major surface water source of Beaufort West, the Gamka Dam, reduced to such low levels that the uninterrupted supply of drinking water to the town was not a certainty. The borehole scheme serves to augment the surface water, but could not supply sufficient quantities of water on its own. The lack of water in the Gamka Dam over the last few years, brought on by severe drought conditions in the catchment area of the Gamka Dam, has placed a lot of pressure on the groundwater sources which are inadequate to supply in Beaufort West's water requirements in the absence of surface water supply from the Gamka Dam.

A water reclamation project, where secondary treated water from the Beaufort West WWTW is further treated (in a new reverse osmosis based treatment plant) to a high quality and mixed with the treated water from the WTW, was commissioned on the 15th of January 2011 to further supplement the existing raw water supply. The additional supply from the reclamation plant for 2014/2015 was 412 Ml (15.5% of Beaufort West's total raw water requirement).

Merweville – Groundwater supply to the town is from seven production boreholes.

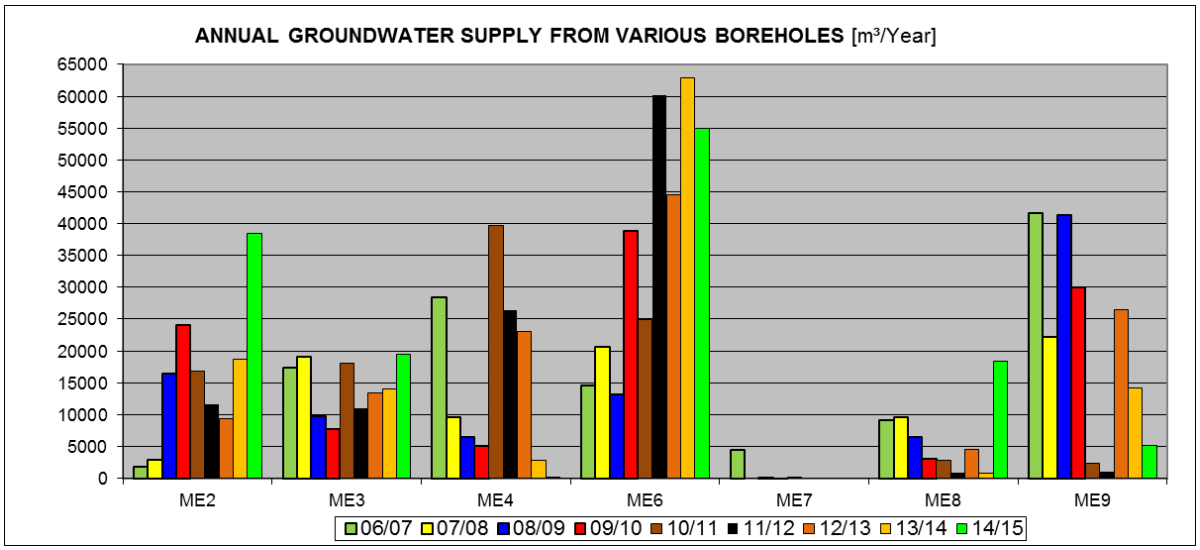


Figure A.17: Annual groundwater supply to Merweville from the various boreholes.

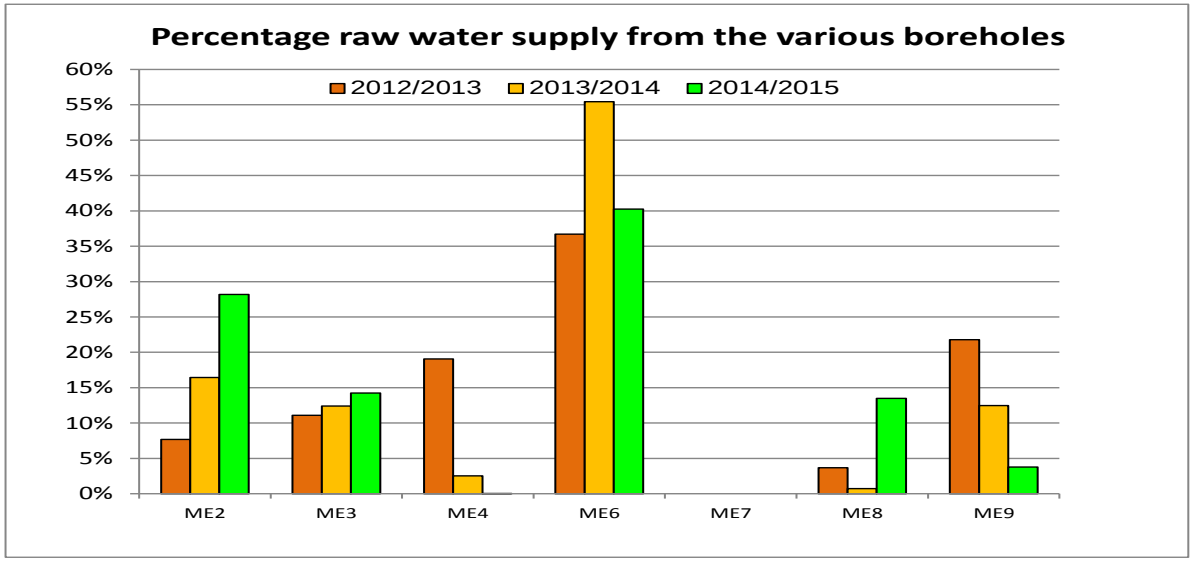


Figure A.18: Percentage raw water supply to Merweville from the various boreholes for the last three financial years.

Nelspoort – The town is supplied with surface water from the Sout River and groundwater from two production boreholes. One new production borehole was drilled during 2009/2010 and the Municipality is currently busy to incorporate this borehole into the network.

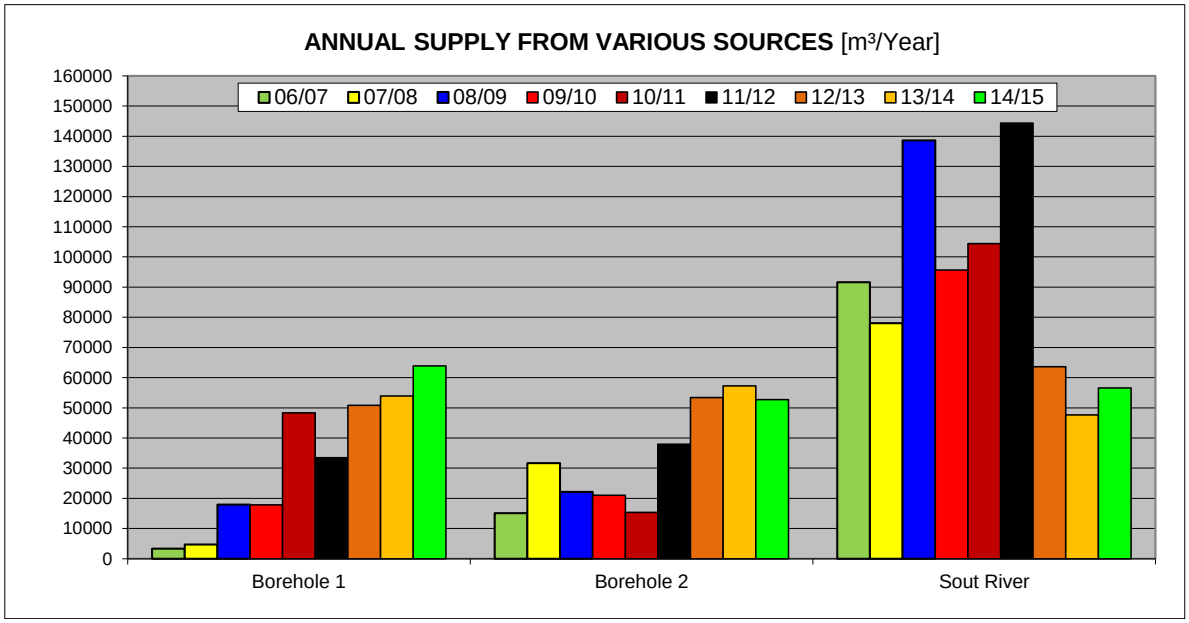


Figure A.19: Annual raw water supply to Nelspoort from the various resources.

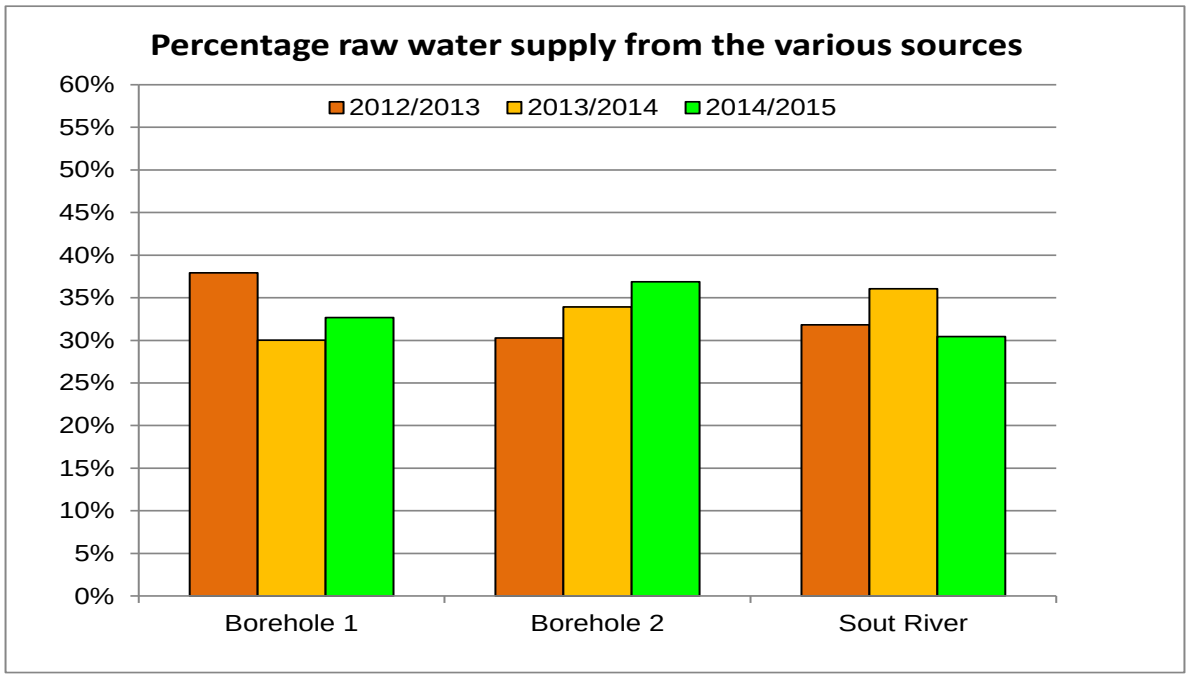


Figure A.20: Percentage raw water supply to Nelspoort from the various resources for the last three financial years.

The drought conditions also impacted on the drinking water supply to Nelspoort, with the surface water abstracted from the weir drying up in the summer months, and the town relying on borehole water to sustain the water feed to the WTW.

Water Quality:

Beaufort West Municipality's detail operational and compliance water quality samplings programmes are summarised in the table below.

Table A.27: Beaufort West Municipality's Water Quality Sampling Programmes

Town	Operational Monitoring			Compliance Monitoring			No. of sampling points
	Raw Water	Filter Water	Final Water	Frequency	Map of Sampling Points	No. of Sampling Points	
Beaufort West	Quality of intake water: Little variation pH (Daily) Turbidity (Daily)	pH (Daily) Turbidity (Every 2 hours)	pH (Daily) Turbidity (Daily) Chlorine (3 / day) Mn (Weekly) Fe (Weekly) Alum (Weekly)	Final Water reservoir pH (Daily) Turbidity (Daily) Chlorine (Daily) Mn, Fe, Alum (Weekly)	Yes	12	12 Points per month
Merweville	Chlorine (Daily)			pH (Weekly) Turbidity (Weekly) Chlorine (Weekly) Mn, Fe, Alum (Weekly	Yes	5	5 Points per month
Nelspoort	Chlorine (Daily)			pH (Weekly) Turbidity (Weekly) Chlorine (Weekly) Mn, Fe, Alum (Weekly)	Yes	5	5 Points per month
Murraysburg	Chlorine (Daily)			pH (Weekly) Turbidity (Weekly) Chlorine (Weekly) Mn, Fe, Alum (Weekly)	Yes	2	2 Points per month

Notes: Merweville Distribution Network Frequency – Water is sent through to Beaufort West on a weekly basis for testing or when there is an opportunity to send a sample through.

Nelspoort and Murraysburg Distribution Networks Frequency – Water is sent through to Beaufort West on a weekly basis for testing.

The water quality compliance sample results are loaded onto DWS's Blue Drop System (BDS) via the internet. Once entered the water quality data is automatically compared to SANS:241. These real-time systems allow for immediate intervention to rectify any problems.

The overall percentage of compliance of the water quality samples taken over the period July 2014 to June 2015 is summarised in the table below per distribution system (DWS's 2014 Blue Drop Limits).

Table A.28: Percentage compliance of the water quality samples for the period July 2014 to June 2015

Performance Indicator	Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2011)	% Sample Compliance according to DWA's 2014 Blue Drop Limits
Beaufort West		
Acute Health – 1 Microbiological	No (Excellent)	100.0%
Chronic Health	No (Excellent)	97.9%
Aesthetic	No (Excellent)	99.7%
Risk assessment defined Health (Acute or Chronic)	No (Excellent)	98.7%
Operational Efficiency	No (Excellent)	98.0%
Merweville		
Acute Health – 1 Microbiological	No (Excellent)	100.0%
Chronic Health	No (Excellent)	96.2%
Aesthetic	No (Excellent)	100.0%
Risk assessment defined Health (Acute or Chronic)	No (Excellent)	96.9%

Table A.28: Percentage compliance of the water quality samples for the period July 2014 to June 2015		
Performance Indicator	**Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2011)**	**% Sample Compliance according to DWA's 2014 Blue Drop Limits**
Operational Efficiency	No (Excellent)	97.1%
Nelspoort		
Acute Health – 1 Microbiological	No (Excellent)	100.0%
Chronic Health	No (Excellent)	97.9%
Aesthetic	Yes (Unacceptable)	76.6%
Risk assessment defined Health (Acute or Chronic)	No (Excellent)	97.9%
Operational Efficiency	Yes (Unacceptable)	84.4%
Murraysburg		
Acute Health – 1 Microbiological	No (Excellent)	100.0%
Chronic Health	No (Excellent)	100.0%
Aesthetic	No (Excellent)	98.2%
Risk assessment defined Health (Acute or Chronic)	No (Excellent)	100.0%
Operational Efficiency	No (Excellent)	95.2%

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 A.29: 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

Effluent Quality: Beaufort West Municipality's Operational and Compliance Wastewater Quality Sampling Programmes are summarised in the table below.

Table A.30: Beaufort West Municipality's Wastewater Quality Sampling Programmes			
WWTW	**Operational Monitoring**		**Compliance Monitoring**
	Sampling Points (Number of samples / month)	**Type of Tests**	**Final Effluent (Number of samples / month)**
Beaufort West	Raw inflow (2) Secondary settle tank (Bio-filters) (2) Secondary settle tank (Activated Sludges) (2) Final effluent (2)	pH Electrical Conductivity Suspended Solids Chemical Oxygen Demand Ammonia	pH (2) Electrical Conductivity (2) Suspended Solids (2) Chemical Oxygen Demand (2) Ammonia (2) Nitrate / Nitrite (2) E.Coli (2) Fluoride (2) Ortho Phosphate (2)
Merweville	Raw Inflow (1) Oxidation Ponds (1)	pH Electrical Conductivity Suspended Solids Chemical Oxygen Demand Ammonia	pH (1) Electrical Conductivity (1) Suspended Solids (1) Chemical Oxygen Demand (1) Ammonia (1) E.Coli (1)

Table A.30: Beaufort West Municipality's Wastewater Quality Sampling Programmes			
WWTW	Operational Monitoring		Compliance Monitoring
	Sampling Points (Number of samples / month)	Type of Tests	Final Effluent (Number of samples / month)
Nelspoort	Raw Inflow (1) Oxidation Ponds (1)	pH Electrical Conductivity Suspended Solids Chemical Oxygen Demand Ammonia	pH (1) Electrical Conductivity (1) Suspended Solids (1) Chemical Oxygen Demand (1) Ammonia (1) E. Coli (1)

The overall percentage compliance of the final effluent samples taken over the period July 2014 to June 2015 at the Beaufort West, Merweville and Nelspoort WWTW is summarised in the table below.

Table A.31: Percentage Microbiological (E.Coli) compliance of the compliance samples taken at the various WWTWs			
WWTW	Number of Samples Taken	Number of Samples Complying with General Standards	Percentage Compliance
Beaufort West	12	12	**100.0%**
Merweville	No analysis was done as final oxidation dam is still empty		
Nelspoort	12	11	**91.7%**
Total	**24**	**23**	**95.8%**

Table A.32: Percentage chemical compliance of the compliance samples taken at the various WWTWs													
WWTW	Number of Compliance Samples Taken				Number of Samples Complying with General Standards				Percentage Compliance				
	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Ammonia	Nitrites & Nitrates	COD	Ortho Phosphate	Overall
Beaufort West	12	12	12	12	5	12	12	12	**41.7%**	**100.0%**	**100.0%**	**100.0%**	**85.4%**
Merweville	N/A	N/A	8	N/A	N/A	N/A	8	N/A	N/A	N/A	**100.0%**	N/A	**100.0%**
Nelspoort	N/A	N/A	9	N/A	N/A	N/A	7	N/A	N/A	N/A	**77.8%**	N/A	**77.8%**
Total	**12**	**12**	**29**	**12**	**5**	**12**	**27**	**12**	**41.7%**	**100.0%**	**93.1%**	**100.0%**	**86.2%**

Table A.33: Percentage physical compliance of the compliance samples taken at the various WWTWs										
WWTW	Number of Compliance Samples Taken			Number of Samples Complying with General Standards			Percentage Compliance			
	pH	Electrical Conductivity	Total Suspended Solids	pH	Electrical Conductivity	Total Suspended Solids	pH	Electrical Conductivity	Total Suspended Solids	Overall
Beaufort West	12	12	12	12	11	12	**100.0%**	**91.7%**	**100.0%**	**97.2%**
Merweville	8	8	N/A	8	8	N/A	**100.0%**	**100.0%**	N/A	**100.0%**
Nelspoort	9	9	N/A	9	0	N/A	**100.0%**	**0.0%**	N/A	**50.0%**
Total	**29**	**29**	**12**	**29**	**19**	**12**	**100.0%**	**65.5%**	**100.0%**	**85.7%**

Industrial Consumers:

There are no wet industrial consumers in Beaufort West Municipality's Management Area, except for a three abattoirs in Beaufort West. No pre-treatment of effluent takes place at the abattoirs before the effluent is discharged into the Municipality's sewer system. The quality and quantity of industrial effluent discharged into the sewer system of Beaufort West Municipality is not yet monitored.

Business Element 10: Financial

Capital Budget:

The three largest water and sewerage projects on which the capital budget is spend during the 2015/2016 financial year are as follows:

- Upgrading of the Nelspoort WWTW;
- New sewerage pump station and rising main in Beaufort West (Area S8); and
- Final phase of pressure reduction in Beaufort West.

Some of the MIG registered projects, which will be implemented during the next three financial years, are as follows:

- Augmentation of Beaufort West groundwater resources; and
- Upgrading of Murraysburg oxidation ponds;

The table below gives an overview of Beaufort West Municipality's historical water and sewerage capital expenditure over the last four financial years.

Table A.34: Historical expenditure of the water and sewerage infrastructure budgets

Financial Year	Water Infrastructure			Sewerage Infrastructure		
	Budget	Expenditure	% Spend	Budget	Expenditure	% Spend
2011/2012	-	R3 869 307	-	-	R106 700	-
2012/2013	R6 167 402	R4 322 932	70%	R10 210 739	R7 772 104	76%
2013/2014	-	R4 081 000	-	-	R4 932 000	-
2014/2015	R2 736 000	R1 880 000	69%	R14 221 000	R12 887 000	91%

Operational Budget:

The table below gives a summary of Beaufort West Municipality Operational and Maintenance Expenditure and Income Budgets for water and sanitation services for the last five financial years.

Table A.35: Summary of Operational and Maintenance Budgets for water and sanitation services

Description	Actual 14/15	Actual 13/14	Actual 12/13	Actual 11/12	Actual 10/11
Water Services (Admin Water, Irrigation Water, Water Purification, Water Reticulation and Water Murraysburg)					
Expenditure	R22 548 681	R20 811 509	R21 806 909	R19 679 510	R15 115 143
Income	R26 133 367	R21 600 276	R15 993 196	R12 842 533	R39 592 872
+Surplus / (Deficit)	**+R3 584 686**	**+R788 767**	**(R5 813 713)**	**(R6 836 977)**	**+R24 477 729**
Sanitation Services (Sewerage System, Sewerage Farm, Vacuum Services)					
Expenditure	R7 671 591	R5 932 047	R4 905 700	R5 500 523	R3 995 653
Income	-R25 863 515	R17 348 523	R17 317 811	R9 227 059	R10 503 026
+Surplus / (Deficit)	**+R18 191 924**	**+R11 416 476**	**+R12 412 111**	**+R3 726 536**	**+R6 507 373**

The water and sanitation services are being managed in a financial sustainable manner by Beaufort West Municipality. A surplus was generated on both water and sanitation services for the last two financial years.

Tariff and Charges:

The first six (6) kl of water is provided free of charge to all indigent residential consumers. Beaufort West 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 Beaufort West Municipality's Indigent Policy and all indigent households therefore receive free basic water and sanitation services. This implies that either the equitable share is used to cover this cost, or higher consumption blocks are charged at a rate greater than the cost in order to generate a surplus to cross-subsidies consumers who use up to six (6) kilolitres per month.

Beaufort West Municipality's current four (4) block step tariff system discourages the wasteful or inefficient use of water. It is expected that this tariff structure will continue to be implemented in the future. The sustainable supply of potable water is becoming an ever increasing challenge. This scarce commodity has to be optimally managed. The 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 has been structured for a basic affordable tariff for up to 20 kl per household per month. Punitive tariffs are in place for excessive water consumption.

Business Element 11: Water Services Institutional Arrangements

Beaufort West Municipality is the official WSA for the entire Municipal Management Area and act as the Water Services Provider for the area. An approved 2013/2014 WSDP is in place. A comprehensive set of water services by-laws is also in place.

A Service Level Agreement with Water and Wastewater Engineering, converted to NEWATER for the Beaufort West Reclamation Plant, is also in place for the operation of the plant.

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.

The vacancy rate of Beaufort West Municipality was 19.45% for the 437 approved posts on the organogram in 2014/2015. The vacancy rate for the 196 approved Engineering Services posts was 23.98% in 2014/2015.

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 DWS for the classification and registration of the Process Controllers and Supervisors at the various WWTW 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 2015/2016 is in place.

Municipal Strategic Self-Assessment (MuSSA): Overseen by the DWS the MuSSA conveys an overall business health of municipal water business and serves as a key source of information around municipal performance. The MuSSA also identifies key municipal vulnerabilities that are strategically important to DWS, the Department of Cooperative Government (DCoG), National Treasury, the planning Commission/Office of the Presidency, the South African Local Government Association (SALGA) and the municipalities themselves. The MuSSA team continues to engage (1) DWS directorates and their associated programmes (e.g. Water Services Development Plan, Water Services Regulation), and (2) other sector departments and their associated programmes (e.g. LGTAS, MISA) to minimize duplication and ensure alignment. Through the tracking of current and likely future performance, the key areas of vulnerability identified, allow municipalities to effectively plan and direct appropriate resources that will also enable the DWS and the sector to provide more effective support.

The Spider Diagram and table below effectively indicates the vulnerability levels of Beaufort West Municipality across the sixteen key service areas, as identified through the Municipal Strategic Self-Assessment of Water Services process.

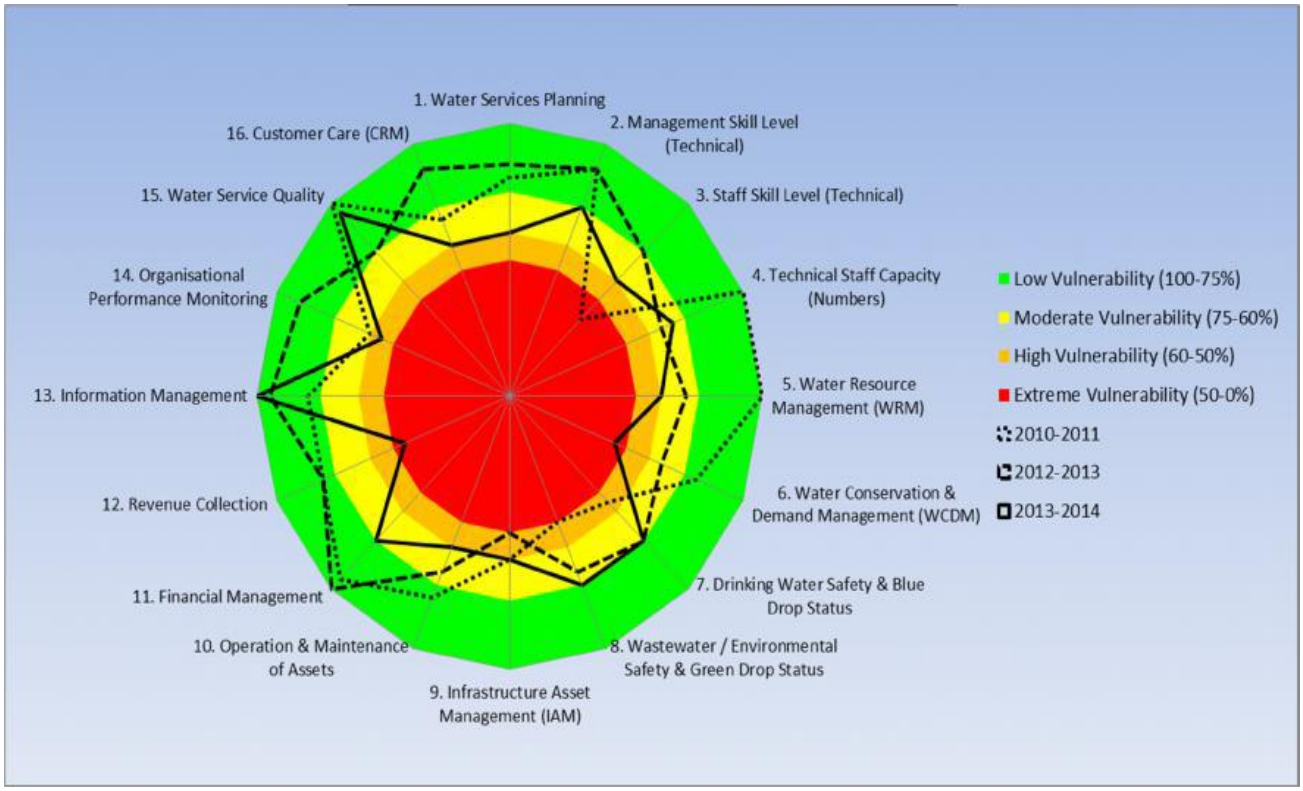


Figure A.21: Spider Diagram of the vulnerability levels of Beaufort West Municipality

Beaufort West Municipality's Vulnerability Index for 2013 was indicated as 0.58 "High Vulnerability" in the "2013 Municipal Services Strategic Assessment (MuSSA) for Western Cape Province" Report.

Beaufort West Municipality is currently effectively managing their water and sanitation services. Special focus is however required to ensure adequate rehabilitation and maintenance of the existing water and sewerage infrastructure.

Business Element 12: Social and Customer Service Requirements

A comprehensive Customer Services and Complaints system (IGNITE) is in place at Beaufort West 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.

A Client Service Charter is also available in English, Afrikaans and isiXhosa. The Charter includes specific service standards, with time periods within which a specific query / complaint will be addressed. The Municipality's Code of Conduct, as also included in their Client Services Charter, is as follows:

- Consultation: The general public should be consulted about the level of service received from the Municipality and, where possible, be given a choice of the services offered.

- Service Standards: The general public should be informed of the level and quality of public services to which they are entitled, so that they are aware of what they should expect of the Municipality.

- Access: The general public should have equal access to the services to which they are entitled.

- Courtesy: The general public should be treated with courtesy and consideration.
- Information: The general public should be given full, accurate information about the public services to which they are entitled.
- Openness and Transparency: The general public should be informed of the manner in which national departments and provincial administrations are run, of their costs and of the people in charge.
- Redress: If the promised standards of service are not delivered, the public should be offered an apology, a full explanation and a speedy and effective remedy. When complaints are made, the public should receive a sympathetic and positive response.
- Value for Money: Public services should be provided economically and efficiently in order to give the public the best possible value for money.

The table below gives an overview of the water and sanitation areas monitored by Beaufort West Municipality with regard to customer services (queries / complaints).

Table A.36: Water and sanitation indicators monitored by Beaufort West Municipality with regard to customer services

Description	14/15	13/14	12/13	11/12	10/11	09/10
Leaks at households, pipelines and taps	1 366	1 291	1 680	1 996	1 875	2 076
Burst pipes in road reserves	473	349	521	521	608	515
Number of network burst and leaks per 100 km of pipeline	311	230	343	343	400	339

Table A.36: Water and sanitation indicators monitored by Beaufort West Municipality with regard to customer services

Complaints		14/15	13/14	12/13	11/12
Call out for main sewer	Office hours	564	471	147	48
Call out for sewer connections	Office hours	1 235	1 027	1 153	1 244
Water meters faulty	Repair leak	445	419	582	825
	Test / Replace	225	163	71	83
	Relocate	2	4	0	5
	Prepaid: Repair faulty meter	739	451	1 065	905
	Prepaid: Replace	114	224	11	25
	Prepaid: Replace Box	83	55	19	101
	Prepaid: Tamper Switch	45	55	24	4
	Prepaid: Replace Stop Valve	95	62	40	0
	Prepaid: Sensor Replace	67	26	17	0
	Prepaid: Need to buy water	147	93	65	264
New water connections	Households	4	5	3	0
	Main pipeline	0	0	0	0
	Prepaid meters	74	0	-	-
Leaks at stop valves	Repair	235	244	303	416
	Replace	122	52	45	31
Standpipes	Repair	0	0	0	0
	Replace / new	0	0	0	0
Call out for valves		28	60	30	16
Call out for brown water		0	0	0	0
Call out for water pressure tests		0	0	0	0
Call out for leaks at households, pipelines and taps		1 366	1 291	1 680	1 996
Call out for burst pipes in road reserves		473	349	521	521
Call out for main pipelines		28	30	-	-

Standby – After Hours	14/15		13/14		12/13	
	Beaufort West, Merweville, Nelspoort	Murraysburg	Beaufort West, Merweville, Nelspoort	Murraysburg	Beaufort West, Merweville, Nelspoort	Murraysburg
Call out for main sewer	499	15	389	15	371	13
Call out for sewer connections	429	192	453	226	515	156
Water distribution: Water Meters	612	52	627	45	818	61
Water distribution: Burst Pipes	251	2	225	3	233	1
Water and Sewer Treatment	69	-	179	-	78	-
Parks	264	-	359	-	238	-
Nelspoort	232	-	200	-	280	-
Merweville	116	-	166	-	209	-
Call outs	-	399	-	647	-	359

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

Beaufort West: Under normal operating condition (i.e. when surface water is available from the Gamka Dam) the water supplied to Beaufort West is a blend of surface and groundwater from various sources. The surface water is from the Gamka Dam and fully treated at the WTW, whereas the groundwater is only chlorinated prior to distribution. A new Wastewater Reclamation Plant was also constructed. The treatment processes consists of the following: Coagulation, Flocculation, Sedimentation and clarification, Filtration, Disinfection, Sludge drying beds and Reactive treatment.

Merweville: No formal WTW exists to treat the water supplied from the boreholes and the water is merely disinfected (gaseous chlorination installation) prior to distribution to end users.

Nelspoort: The water from the Salt River is abstracted at an existing weir and treated at the WTW with the groundwater. The treatment processes consists of the following: Aeration, Filtration and Disinfection

Murraysburg: The water from the boreholes is merely chlorinated (informal manual practise) at the reservoirs prior to distribution to end users.

The quality of potable water (Chemical and Biological) is monitored at the various locations within the distribution systems and tested at an accredited laboratory. The EHPs of the Central Karoo District Municipality also monitors the water quality.

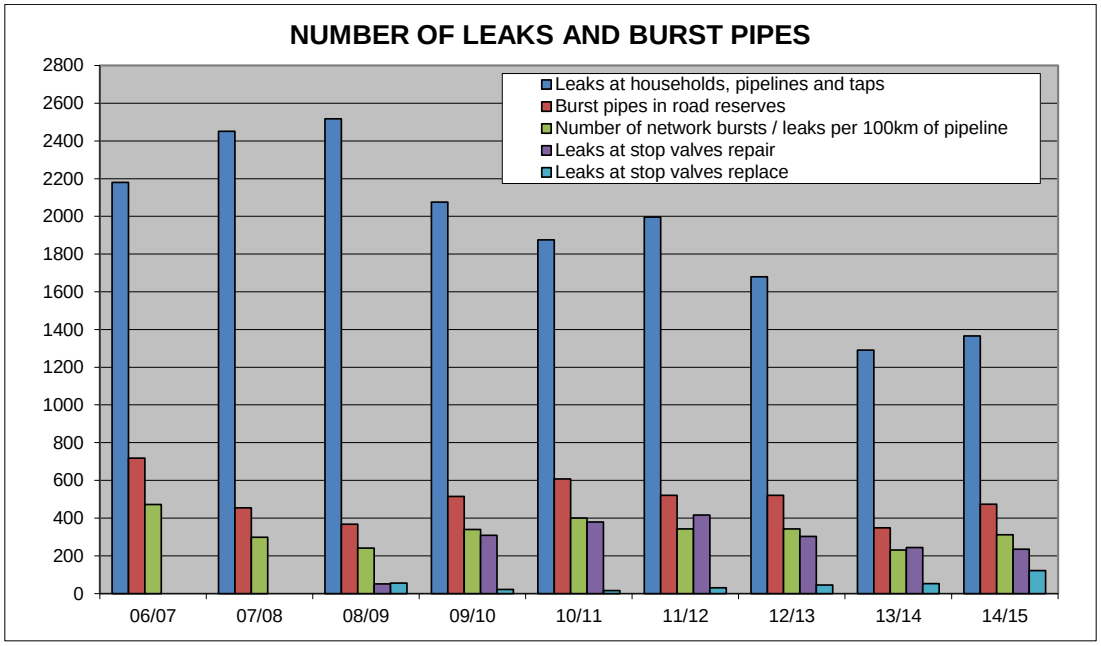


Figure A.22: Number of leaks and burst pipes for the last nine financial years

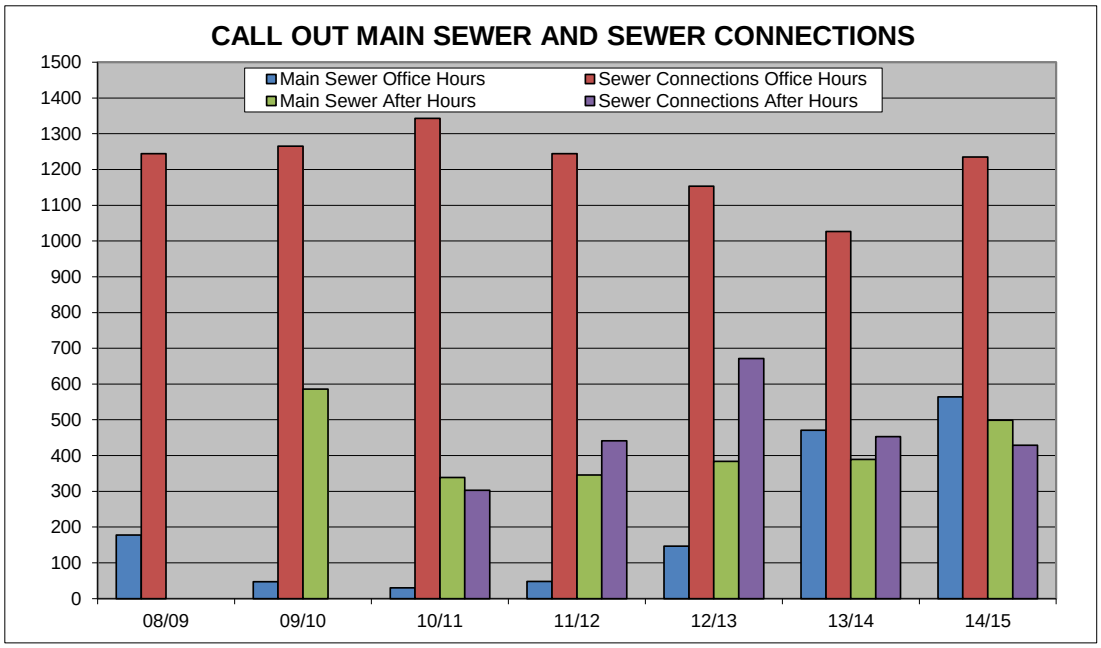


Figure A.23: Number of call outs for the main sewers and sewer connections for the last seven financial years.

SECTION B: STATE OF WATER SERVICES PLANNING

This WSDP is for 2017-2022 (First Cycle) and Beaufort West Municipality is committed to update their WSDP for the interim years and to compile a new WSDP every five years, as required by legislation. The 2017-2022 (First Cycle) WSDP will also be populated on the eWSDP website of the DWS.

Beaufort West Municipality also compiled annual WSDP Performance- and Water Services Audit Reports for the last number of years. The WSDP Performance- and Water Services Audit Report gives an overview of the implementation of the Municipality's previous year's WSDP and can be seen as an annexure to Beaufort West Municipality's Annual Report.

Beaufort West Municipality's Water and Sewer Master Plan process entails the establishment of computer models for the water systems and the sewer systems in Beaufort West Municipality, the linking of these models to the stand and water meter databases of the treasury financial system, evaluation and master planning of the networks and the posting of all the information to IMQS. The Water and Sewer Master Plans lists the analyses and findings of the study on Beaufort West Municipality's water distribution and sewer drainage systems.

The latest Water and Sewer Master Plans, which were available for inclusion in Beaufort West Municipality's WSDP, were as follows:

- Water Master Plan, Beaufort West Municipality, November 2008.
- Sewer Master Plan, Beaufort West Municipality, November 2008.

The other Water Services Planning studies recently completed were as follows:

- MIG Technical Reports were completed for the upgrading of the Nelspoort and Murraysburg oxidation pond systems.

SECTION C: WATER SERVICES EXISTING NEEDS PERSPECTIVE

The existing needs perspective as presented below was developed through a systematic and comprehensive review of the water services function in terms of the WSDP Guide Framework. The output from this process is presented below and includes compliance assessment in terms of:

- Quality: Assessment current status against compliancy requirements.
- Quantity: An indication of the representation of the total area to address the issue.
- Future plan assessment: Degree in which future demand has been established.
- Strategy assessment: Whether a Strategy is in place to address the need.

The water services situation analysis prompted the development of problem statements which formed the input for the development of the water services objectives and strategies which follows in Section D.

Business Element 1: Administration

Table C.1 : Business Element 1: Administration (Topic 1)						
Overview of Topic		**Status Quo and Knowledge Interpretation Statistics**				
This topic provides knowledge on the status of the WSA's 5-year WSDP as well as with the contact particulars of the key role-players which have contributed to the development of the WSDP.		**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
		n/a	n/a	n/a	n/a	n/a
		TOTAL for Topic	**n/a**	**n/a**	**n/a**	**n/a**
Problem Definition Statements						
Nr	**Statements - Short Comings**		**Possible Improvement / Project**			
1	Key issues raised in the WSDP need to be taken to the IDP		Ensure Executive Summary of WSDP (WSDP-IDP Water Sector Input Report) is included in the IDP.			

Community Participation: Public participation in Beaufort West is done in a structured way. The directive from national government on how community participation should be structured is the ward committee system. The Council set up Ward Committees and an IDP Representative Forum in order to ensure proper public participation. The purpose of the Ward Committee is:

- To get better participation from the community to inform Council decisions;
- To make sure that there is more effective communication between the Council and the community; and
- To assist the Ward Councillor with consultation and report-backs to the community.

The ward committees support the Ward Councillor who receives reports on development, participate in development planning processes, and facilitate wider community participation. To this end, the municipality constantly strives to ensure that all ward committees function optimally with community information provision; convening of meetings; ward planning; service delivery; IDP formulation and performance feedback to communities.

The Vision, Mission and Strategic Objectives of Beaufort West Municipality, as included in their 2012-2017 IDP, are as follows:

Vision: *"Beaufort West, land of space in the Great Karoo, strives to improve the lives of all its residents by being a sustainable, expanding and safe town"*

Mission:To reflect the will of the South African people as reflected in the Constitution and by Parliament:

- An affective municipal system, maintained at the highest standard.
- To create affordable and sustainable infrastructure for all residents and tourists.
- Business initiatives and the optimalisation of tourism (local and foreign).
- Empowerment of personnel, management and Council members for effective service delivery.
- Creating and maintaining an effective financial management system.
- To develop the region as the sport and recreational mecca of the Karoo.
- To create a crime-free, safe and healthy environment.
- Agricultural business to improve the potential for job creation.
- Creation of employment to reduce unemployment to acceptable levels.
- To reduce poverty and promote the empowerment of women.
- To involve HIV/Aids sufferers in economic and household responsibilities.

The **Strategic Objectives** of Beaufort West Municipality are as follows:

- Basic Service Delivery and Infrastructure Development
  - To improve and maintain current basic service delivery and infrastructure development through the provision of basic services and specific infrastructural development projects, and
  - To collaborate with other provincial and national government departments to respond to the current needs in the community around water, sanitation, housing, roads and sport and recreation.
- Institutional Development and Municipal Transformation
  - To embark on a radical turnaround strategy to address the administrative and financial challenges facing the municipality.
  - To implement structures, mechanisms and systems.
  - Fill budgeted vacant posts.
  - Monitoring and evaluation by implementing and effective organizational performance management and compliance systems.
  - Ongoing skills development of staff, and
  - The development of performance management contracts for all key managers.
- Financial Viability and Management.
  - As part of a turnaround strategy.
  - The development of financial policies, a budget management system, asset and liability control mechanisms and strategies to fund priorities projects, and
  - Ongoing skills development of staff.
- Good Governance and Public Participation
  - To educate and train staff to live the principles of “Batho Pele”
  - To develop mechanisms and processes where communities become aware of the pivotal role that they play in their own development.
  - To develop a communication strategy to inform and educate citizens.
  - To train and develop Ward Committees.
  - To train Councillors on the central role that they play in the effective consultation of ward committees and accountability to citizens.
  - To maintain a system of good governance and adhere to all legislated good governance practices.
- Local Economic Development
  - To foster intergovernmental relations Nationally and Provincially through the design and delivery of projects of that will make a significant impact in the life of citizens.
  - The development of an LED strategy with a prime focus on job creation – both skilled and sustainable jobs, short term jobs and jobs as part of the extended Public Works Programme.
  - To develop mechanisms and processes where communities become aware of the pivotal role that they play in their own development.
  - To harness the natural resources of the municipal area and collaborate with other organs of state, NGOs, business and other relevant stakeholders to respond to the environmental challenges and how the environment can be used to contribute to social and economic development.
  - Explore one big project to generate income directly for the municipality.

Business Element 2: Demographics

Table C.2 : Business Element 2: Demographics (Topic 2)						
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**					
This topic provides an overview of demographics of the WSA as sourced from the National Geo-Referenced Database, aligned to Census figures as well as the number of public amenities and private facilities within the jurisdictional area of the WSA.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**	
	Settlement Types (Urban, Rural , Farming)	Scores will be finalised once the new eWSDP website is fully populated.				
	Public Amenities Consumer types					
	TOTAL for Topic					
Problem Definition Statements						
Nr	**Statements - Short Comings**	**Possible Improvement / Project**				
1	Conservative approach is followed regarding the management of water sources, due to the possible impact 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. Establish assurance of supply levels of all water sources.				
2	Protect the existing critical endangered plant and animal species and repair the river systems.	Continue with the implementation of the recommended environmental strategies as included in the SDF. Support the Riparian Habitat Rehabilitation Project.				
3	Stimulate local economic development and social upliftment through the provision of housing.	Obtain verification of housing waiting list to reflect the actual beneficiaries. Submit application to National Treasury for assistance with regards to the housing function. Engage with SALGA. Appoint a Manager responsible for housing in the Municipality.				
4	Municipality needs to evaluate all land use planning applications against the broad SDF principles before recommendations for decision making are made.	Continue with the implementation of the reviewed and adopted SDF priority action plans for each of the towns and ensure new developments are in line with these priority action plans.				
5	Ensure the required bulk water and sewerage infrastructure are in place before housing projects are implemented.	Ensure that the provision of bulk water and sewerage infrastructure are aligned with the Integrated Human / Settlement Plan (Housing Pipeline) and that housing projects only continue once the required bulk water and sewerage infrastructure are in place.				

Beaufort West Municipality's 2013 reviewed and adopted SDF sets out broad principles for future developments, as well as where such developments can take place within the demarcated urban edges of all towns and in the rural areas. All land use planning applications will be evaluated against these broad principles before recommendations for decision making will be made.

The Beaufort West Municipality wants to stimulate local economic development and social upliftment through, inter alia, the provision of housing. In this regard, the municipality prioritised the identification, acquisition (if required), release and development of well-located land to ensure availability of land for housing and the spatial integration of towns. Furthermore, a strong and vibrant economy is required in the leader town, viz. Beaufort West.

The development of an Integrated Human / Settlement Plan underlines the Council's strategy to ensure that human settlements are integrated and sustainable, that housing backlogs are eliminated and that housing provision focuses on all income groups. The Council of Beaufort West Municipality approved a Housing Pipeline process as to address the backlog in housing.

The 2014/2015 Annual Report indicated the IRDP subsidy housing need (< R3 500 per month) at 4 841 units and the gap housing need (R3 501 – R15 000 per month) at 641 units. The table below gives an overview of the planned housing sites.

Table C.3: Beaufort West Municipality's Housing Pipeline

Housing Type	Priority	Site	Area	Units
IRDP Housing	1	S8	IRDP Project Linked Subsidy	234
	2	S1	Transnet	Not available at this stage
	3	S2	Commonage	850
GAP Housing	1	G2	Erf 2851 - POS	67

The housing challenges and the actions to address these challenges are summarised in the table below:

Table C.4: Beaufort West Municipality's housing challenges	
Housing Challenge	**Actions to address challenge**
Waiting list for housing	Obtain verification of waiting list to reflect the actual beneficiaries.
Annual funding allocation for housing	The Municipality finds it difficult to make enough funds available for the housing function. Applications to be submitted to National Treasury for assistance with regards to the housing function, especially in the case of small revenue municipalities.
Housing policy with regard to beneficiaries who are 40 years or younger are excluded with regards to housing.	National government to review the policy, municipality to engage with SALGA in this regard in the new financial year.
Position of manager not filled due to financial constraints.	Ensure that budget will be allocated in the new financial year for the appointment of a manager in the position.

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, funds and some bulk infrastructure upgrades.

Beaufort West Municipality is also committed to poverty alleviation through their subsidised services to indigent households. Free basic water services to indigent households have increased from 2 898 households as at June 2014 to 5 790 households as at June 2015.

Business Element 3: Service Levels

Table C.5: Business Element 3: Service Levels (Topic 3)						
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**					
Topic 3 information is presented in terms of the Department of Water and Sanitations' service level classification which considers the adequacy of services in establishing the service level profile. The profile is presented in terms of settlements, population and households.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**	
	Water - Below : No Services (Formal)	Scores will be finalised once the new eWSDP website is fully populated.				
	Water - Below : Infra. Needs					
	Water - Below : O&M Needs					
	Water - Below No Services (Informal)					
	Sanitation – Below : No Services (Formal)					
	Sanitation – Below : Infra. Needs					
	Sanitation – Below : O&M Needs					
	Sanitation – Below : No Services (Informal)					
	Residential, Public Institutions and Industries Amenities					
	TOTAL for Topic					
Problem Definition Statements						
Nr	**Statements - Short Comings**	**Possible Improvement / Project**				
1	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 still below RDP standard.				

As a priority it is the responsibility of Beaufort West 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 Beaufort West 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 Beaufort West 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 Beaufort West Municipality's Indigent Policy.

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

All the formal households in the urban areas of Beaufort West Municipality's Management Area are provided with water connections inside the houses (Higher level of service). Communal standpipes and ablution facilities are only provided as an emergency service. Beaufort West 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.

Beaufort West 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. Beaufort West Municipality is 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 viable 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 Central Karoo District Municipality responsible for environmental health and Beaufort West Municipality.
- Subsidising the operating and maintenance costs. If the basic service is to be provided free to the poor then Beaufort West Municipality must ensure that the costs of providing the service are covered by the local government equitable share and / or through cross-subsidies within Beaufort West 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 hospital in Beaufort West Municipality's Management Area have adequate and safe water supply and sanitation services. All the schools in Beaufort West Municipality's Management Area also have adequate and safe water supply and sanitation services. It is important for the schools in Beaufort West Municipality's Management Area to focus on Water Demand Management activities and for Beaufort West Municipality to support the schools with a WDM programme.

Business Element 4: Socio Economic

Table C.6 : Business Element 4: Socio-Economic (Topic 4)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
The socio-economic information contained in the WSDP provides a broad overview of the socio-economic status of the municipality in terms of population growth rates, age and gender profile, employment profile, migration patterns, household income and economics. The topic also contains a quick reference to water services affordability by expressing the typical monthly water bill in terms of average monthly income in the municipal area.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	General	Scores will be finalised once the new eWSDP website is fully populated.			
	Age and gender profile				
	Employment profile				
	Demographic trends and migration patterns				
	Household income				
	Water Affordability				
	Sanitation Affordability				
	Economics				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	Various socio economic needs in the Management Area.	Alleviation of poverty by means of the Municipality's Indigent support, Local Labour Promotion Projects, LED projects and the use of Supply Chain Management Policy as an instrument to enforce the maximum use of local labour.
2	High unemployment figures, low skills and limited economic opportunities.	Focus on initiatives to empower and develop skills in the labour force in order to improve the economy of the Municipality and to reduce the unemployment figures. Continue with the development of Youth Units to facilitate and enhance youth development and implement Youth Programmes.
3	Review the LED Strategy and appoint a dedicated LED Official	Review the LED Strategy and appoint a LED Official to continue with the intersectoral job creation opportunities including the EPWP programme, the Community Work Programme, Youth in Waste programme and Food for Waste.
4	Increase demand for low cost housing within the various towns and the Municipality will need to keep up with the demand for houses, which is subject to the availability of land and funds made available by the relevant Provincial Departments (Urbanisation).	Actively implement the Integrated Human / Settlement Plan (Housing Pipeline). Ensure adequate bulk water and sewerage infrastructure are in place before these developments continue (Implement Water and Sewer Master Plans).
5	Commission a skills audit and gap assessment within the communities.	Beaufort West Municipality needs to collaborate with the private sector and local non-profit organizations to provide needed skills at all levels and a skills development exercise focusing on specific priorities. The projects should focus on socio-economic upliftment, as part of Beaufort West Municipality's strategy to bring about poverty alleviation through job creation whilst enhancing the prospects of reducing outstanding municipal consumer debt.

The needs of the communities in Beaufort West Municipality's Management Area reflected mainly on the following:

- Economic Development;
- Infrastructure Development;
- Health Services;
- Youth Development;
- Housing Delivery;
- SMME Development;
- Availability of Agricultural land;
- Sport and Recreation; and
- Skills development.

At present, economic development in the Beaufort West municipal area is based on the following four main growth factors:

- The location of the area along the N1 transport corridor connecting Cape Town with the northern parts of South Africa and serving as northern gateway to the Cape;
- Existing agriculture produce, practices and infrastructure;
- Tourism related opportunities, centred mainly on the Karoo National Park and game farming; and
- Local climatic conditions conducive to renewable energy generation.

There is a number of limiting issues that could impact on the extent of growth in the area, i.e.

- The different towns in the area are small and lack the potential for strong local development momentum;
- The tourism attractions do not draw large numbers of visitors;
- The transit traffic to Gauteng and the Cape mostly just passes through the area without much stopover activity;
- There are no significant (new) development projects in the area attracting (new) investors or supply chain additions – apart from renewable energy facilities;
- Sustainable land use changes and land reform opportunities;
- Water supply limitations (accelerated by longer run climate change) and new energy sources on evolving local economic activities;
- Existing structural deficiencies within all urban and rural configurations;
- Climate change that will affect South Western Africa quite significantly, implying lower rainfall and some dampening of the current pattern of agricultural production. At the same time efforts to better utilize local water resources, dams and other storage facilities should be intensified. The same is expected in the sphere of power generation and the utilization of alternative energy sources.

Initiatives to empower and develop skills in the labour force would be vital in improving the economy of the Municipality and reducing unemployment figures. Although Youth Development has been central to the priorities of the municipality through the development of the completed Youth Hub, the municipality experienced financial constraints to appoint a dedicated person to lead youth development in the municipality. The priority remains the development of Youth Units to facilitate and enhance youth development. A number of programmes have been implemented, including the Youth Hub, driver's licenses, learnerships, internships, computer training, general job creation and advocacy work.

A critical aspect of infrastructure development is the obligation and commitment to create jobs. Direct job creation takes place through the development, operation and management of water infrastructure, which indirect job creation flows from the associated water supplies to economic activities such as mining, manufacturing, power generation and agriculture.

Investment in infrastructure development could create employment for local workers and provide skills development and work experience at a number of levels, from the highly technical jobs to manual labour, particularly where labour-intensive construction methods are used. The operation and management of water infrastructure also offers opportunities for job creation.

Beaufort West Municipality is conscious of the challenges of poverty in the area and strives to contribute towards the alleviation thereof by means of e.g. their indigent support, Local labour Promotion Projects, LED projects and the use of Supply Chain Management Policy as in instrument to enforce the maximum use of local labour.

Urbanisation is likely to continue with more and more farmworkers moving to the nearest urban settlements. This trend will increase the demand for low cost housing within the various towns and the Municipality will need to keep up with the demand for houses, which is subject to the availability of land and funds made available by the relevant Provincial departments. The economy, job opportunities and the influx of people into the municipal area also impact on the need for houses and the provision of water and sanitation services. A Housing Strategy is in place to manage housing delivery in Beaufort West Municipality's Management Area.

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

Beaufort West Municipality's free basic services and indigent support caters for a proportion of the population not being able to afford water and sanitation services. The proportion of the population who cannot afford water and sanitation is also examined each year during the budgeting and tariff setting process and tariffs are adjusted accordingly. Households that cannot afford to pay can register as indigent on the Municipality's Indigent Register.

A LED Strategy is in place, but the Municipality currently does not have a dedicated LED official and needs to review the LED Strategy. The Municipality has been involved in some intersectoral job creation opportunities including the EPWP programme, the Community Work Programme, Youth in Waste programme and Food for Waste. Some of these programmes will not be continued due to a lack of funding whereas others will proceed.

Investing in infrastructure creates an enabling environment for economic growth and is an important precondition for sustainable growth. Failure to adequately budget for the rehabilitation and maintenance of the existing infrastructure poses a serious threat to the local economy. The deterioration of the existing networks and rapid development, which is not always matched by growing capital expenditure, further exacerbates the situation. Adequate rehabilitation and maintenance of the existing infrastructure is critical in order to ensure the medium to long term sustainability of the existing infrastructure.

Business Element 5: Water Services Infrastructure Management (Infrastructure)

Table C.7: Business Element 5: Water Services Infrastructure (Topic 5)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
Topic 5.1 provides an overview of the extent-, functionality- and asset status of the municipality's water services infrastructure. It also provides an overview of the municipality's compliance in terms of legislation- and regulations concerning asset management, disaster management, water quality management, water resource licensing, etc. It should be emphasized that the topic does not provide the detail per infrastructure element, but provides an overview per each main water services infrastructure component.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	General Information	Scores will be finalised once the new eWSDP website is fully populated.			
	Operation				
	Monitoring and sample failure				
	Functionality				
	Institutional status				
	Asset assessment spectrum				
	Type and capacity				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	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.
2	Inadequate capacities of water pump stations and reticulation networks.	Upgrade existing water pump stations and provide new pump stations for specific areas, as identified in the Water Master Plan. Upgrade sections of the reticulation network as proposed in the Water Master Plan.
3	Inadequate capacities of sewer pump stations and sewer drainage networks.	Upgrade existing sewer pump stations and provide new sewer pump stations for specific areas, as identified in the Sewer Master Plan. Upgrade sections of the drainage network as proposed in the Sewer Master Plan.
4	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.
5	Ensure that an appropriate asset management plan (AMP) is developed and implemented.	Develop an Asset Management Plan (AMP) from the 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.
6	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.
7	The O&M budget allocated to repairs and maintenance is low and additional budget should be allocated to address amongst other tasks the replacement of malfunctioning and old water and sewerage infrastructure. Beaufort West Municipality needs to differentiate between budget allocated towards the operation and maintenance of the water infrastructure and budget for the replacement of infrastructure.	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.
8	Ensure that all the assets, as listed under the various tables in this chapter, are included in the Asset Register.	Update the Asset Register to include all the assets.
9	The Water and Sewer Master Plans were last updated in 2008.	Update the Water and Sewer Master Plans

The table below gives an overview of the future water and sewerage infrastructure needs of Beaufort West Municipality, in order to accommodate development and population growth according to the SDF.

Table C.8: Future Water and Sewerage Infrastructure requirements							
Area	**Sources**	**WTWs**	**WWTWs**	**Water Master Plan**	**Sewer Master Plan**	**Projects to reduce UAW**	**Total**
Beaufort West	R60 000 000	-	R12 700 000	R18 017 479	R8 493 464	R1 890 000 *	
Merweville	-	-	-	R3 892 049	R4 932 907	R1 000 000 *	
Nelspoort	-	R6 300 000 *	-	R699 056	R1 332 846	R1 000 000	
Murraysburg	R1 250 000 *	R500 000 *	R7 073 114	R3 950 000*	-	R1 250 000*	

Note: * Identified through CIP process (February 2011, BKS)

WATER TREATMENT WORKS INFRASTRUCTURE

The capacity of the **Beaufort West WTW** is adequate, with regard to the treatment of the water from the Gamka Dam (license meets design capacity). The following condition assessment of Beaufort West WTW was done as part of the CIP (BKS, February 2011).

Table C.9: Condition assessment of Beaufort WTW during the CIP (February 2011)

Item	Condition
Inlet works	Poor condition need emergency maintenance
Chemical handling facilities (building and equipment)	Poor condition need emergency maintenance
Sedimentation tanks	Fair condition need future maintenance
Flocculation tanks	Fair condition need future maintenance
Filters	Fair condition need future maintenance
Disinfection	Fair condition need future maintenance
Sludge drying beds	Fair condition need future maintenance
Valves and steel pipe work	Poor condition need emergency maintenance
Electrical and Control equipment	Fair condition need future maintenance

The WTW was designed on a duty standby basis for the various treatment stages and is in a reasonable condition, although several pieces of equipment have aged and are / will be in need of refurbishment and / or replacement in the near future. Electrical and control equipment need special mention as they are intricate high cost items that are often overlooked. The CIP recommended a refurbishment project of the entire WTW, but especially the chemical handling facilities, electrical and control elements (within the next five years).

Groundwater from the boreholes is only disinfected by means of chlorination (gaseous chlorine installation) before being distributed directly into the water supply system. This treatment is basic, but acceptable, in terms of the treatment of water supplied from boreholes. If the groundwater sources are managed well and the quality of the water don't deteriorate, then the current level of treatment is acceptable.

The following condition assessment of **Merweville WTW** was done as part of the CIP (BKS, February 2011).

Table C.10: Condition assessment of Merweville WTW during the CIP (February 2011)

Item	Condition
Disinfection	Very poor condition need total replacement / refurbishment
Valves and steel pipe work	Poor condition need emergency maintenance
Electrical and control equipment	Poor condition need emergency maintenance
General condition of civil works / buildings	Poor condition need emergency maintenance

Groundwater from the boreholes is only disinfected by means of chlorination (gaseous chlorine installation) before being distributed directly into the water supply system. This treatment is basic, but acceptable, in terms of the treatment of water supplied from boreholes. If the groundwater sources are managed well and the quality of the water don't deteriorate, then the current level of treatment is acceptable. The CIP recommended that the disinfection installation will have to be replaced or refurbished to ensure that the required level of service is maintained.

The following condition assessment of **Nelspoort WTW** was done as part of the CIP (BKS, February 2011).

Table C.11: Condition assessment of Nelspoort WTW during the CIP (February 2011)

Item	Condition
Inlet works	Fair condition need future maintenance
Chemical handling facilities (building and equipment)	Fair condition need future maintenance
Filters	Fair condition need future maintenance
Disinfection	Good / excellent condition need preventative maintenance
Valves and steel pipe work	Poor condition and need emergency maintenance

Table C.11: Condition assessment of Nelspoort WTW during the CIP (February 2011)	
Item	**Condition**
Electrical and control equipment	Fair condition need future maintenance
General condition of civil works / buildings	Poor condition and need emergency maintenance

The old aerator is crucial, with regard to the treatment of the borehole water. The CIP indicated that the asset is in a poor condition and replacement plans will have to be made in the near future (next five years).

The CIP indicated that with regard to the treatment of water from the Salt River and borehole water combination (filtration and chlorination), there is currently no backlog in infrastructure (licence meets design capacity), however, the results in bacteriological failures will have to be investigated to see if the disinfection (at present) is sufficient.

Traditional full scale treatment comprising of coagulation (aluminium sulphate and lime), flocculation and sedimentation, filtration and disinfection, is recommended to remove the minerals and other impurities. This could replace the current treatment if additional aeration of borehole water is also provided.

The following condition assessment of **Murraysburg WTW** was done as part of the CIP (BKS, February 2011).

Table C.12: Condition assessment of Murraysburg WTW during the CIP (February 2011)	
Item	**Condition**
Valves, meters and steel pipe work	Fair condition need future maintenance
PVC pipes	Poor condition need emergency maintenance
Electrical and control equipment	Fair condition need future maintenance
General condition of civil works / buildings	Very poor condition needs total replacement / refurbishment

The informal chlorination practise is insufficient to ensure that the water supplied to end users meets the bacteriological requirements for drinking water. A formal disinfection installation is required.

RESERVOIR INFRASTRUCTURE

The condition of all the reservoirs in Beaufort West Municipality's Management Area is good and the reservoirs are well maintained. The levels of the reservoirs are monitored through a telemetry system. The storage capacities of the Merweville and Murraysburg reservoirs are insufficient, with storage capacities of 17.5 hours and 19 hours of the PDD currently available for these towns. The storage factors of the reservoirs, based on 1 x PDD (24 hours storage capacity), are as follows:

Table C.13: Future reservoir storage capacities required		
Town	**Storage Factor**	**Recommendations included in the Water Master Plan**
Beaufort West	1.35	When additional storage capacity is required, a new 3 Ml reservoir should be constructed at the existing Beaufort West reservoirs site.
Merweville	0.73	When additional storage capacity is required, a new 0.5 Ml reservoir should be constructed at the existing Merweville reservoir site.
Nelspoort	1.12	No new reservoirs are required in future
Murraysburg	0.79	Replace existing 0.25 Ml reservoir due to its poor condition, abandon old 0.2 Ml reservoir, and provide 0.5 Ml additional storage i.e. 1 Ml in total (CIP)

WATER PUMP STATIONS AND WATER RETICULATION INFRASTRUCTURE

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

The operational staff indicated no operational problems within the reticulation system, when the Water Master Plan was compiled. The Water Master Plan also indicated the capacities of the three water pump stations in Beaufort West as unknown and that it may possible require upgrading.

Recommendations included in the Water Master Plan were as follows:

Table C.14: Future water pump stations and water reticulation infrastructure required

Proposed distribution zones	Proposed future system and required works	Bulk System	Pump Stations
BEAUFORT WEST			
• The boundaries of the Beaufort West reservoir zone are increased to accommodate future development areas in the zone. • A new Rustdene PRV zone is proposed for water demand management purposes.	• 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 Beaufort West distribution network. • When pressure problems occur in the northern erven of the Kwa Mandlenkosi PRV zone the static and residual pressures can be improve by changing the PRV setting to 35m head.	• 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 pump station from the proposed 100 kl balancing tank to the Beaufort West water network is proposed when the balancing tank is constructed.
MERWEVILLE			
• There are no changes to the existing distribution zone.	• The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario.	• Existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario	• No future pump stations are required.
NELSPOORT			
• The only change to the existing distribution zone is that the existing boundary of the existing zone is increased to accommodate future development areas.	• 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.	• Existing bulk water supply system has sufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development area.	• No future pump stations are required.

Note: Water Master Plan for Murraysburg is not available

SEWER PUMP STATIONS AND SEWER RETICULATION

The operational staff indicated no operational problems within the sewer reticulation system, when the Sewer Master Plan was compiled. Recommendations included in the Sewer Master Plan were as follows:

Table C.15: Future sewer pump stations and sewer reticulation infrastructure required

BEAUFORT WEST	MERWEVILLE	NELSPOORT
• A new main outfall sewer (Items BWS 2.1 & BWS 2.2) is proposed for future development areas B8 & B9. • The outfall sewers in the Blyth Street drainage area should be upgraded according to the master plan, if overflow problems occur when future development areas B1 – B5 develops. • The existing pump stations were modelled with assumed scouring velocities in the accompanying rising mains and it is recommended that the duty points of these pump stations be verified by field pumping tests.	• The existing drainage area is increased to accommodate the existing erven in Merweville that are not currently incorporated in the existing sewer system. • A new outfall sewer (Items BMS 1.1 & BMS 1.2) is proposed for the existing erven in the Merweville drainage area that are currently not connected to the existing sewer system. A new syphon (Item BMS 1.3) is proposed to cross the river.	• The existing Nelspoort Main pump station drainage area is increased to accommodate future development areas N1-N4 that fall within this drainage area. • The existing Nelspoort Main pump station should be upgraded to a capacity of 15 l/s when it reaches its capacity. • The existing pump stations were modelled with assumed scouring velocities in the accompanying rising mains and it is recommended that the duty points of these pump stations be verified by field pumping tests.

The telemetry system whereby the pump stations are closely monitored should be upgraded and utilized to its full potential in order to assist with the operation and management of the systems. Anticipated full development and existing developed areas not currently served by a sewer reticulation system were incorporated into the existing sewer systems for each town or drainage area in the Sewer Master Plans.

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 C.16: Existing capacities and flows at each of the WWTWs (Ml/d)

WWTW	Existing Hydraulic Capacity	Peak Month Average Daily Flow	Average Daily Flow (July 2014 – June 2015)	Average Wet Weather Flow (Oct – Dec 2014)
Beaufort West	4.659	3.115	2.794	2.986
Merweville	0.111	Unknown	0.071*	Unknown
Nelspoort	0.434	0.214	0.169	0.147
Murraysburg	0.400	Unknown	Unknown	Unknown

Note: * Estimated from billed metered consumption data

The **Beaufort West WWTW** was constructed in approximately 1980 and is in a reasonable good condition and is well maintained. The condition of the concrete in the works raises concern and concrete spalling on the aeration bridges and some other structures were visible during the CIP inspection process. The cause of water ingress is often poor construction, but could also be accelerated by hydrogen sulphide attack to the concrete at the WWTW. Rehabilitation of the concrete needs to be carried out to ensure the structural integrity of the bridges, tanks, etc. The WWTW has sufficient capacity to treat the current flow received at the works.

To ensure robustness of the works' operational reliability, it was advised in the CIP that the second archimedean screw pump and a second screen be installed. This will ensure a duty standby setup, eliminating downtime to establish temporary measures to deal with the failures if and when they occur.

Merweville WWTW: The capacity of the WWTW was upgraded during 2010/2011. The current capacity of the WWTW is 0.111 Ml/d.

Nelspoort WWTW: A recent assessment of the hydraulic and organic loading design capacities of the WWTW indicated that the primary ponds are slightly under capacity, but that the secondary and tertiary ponds have sufficient capacity. Beaufort West Municipality is currently busy with the upgrading of the Nelspoort WWTW. The upgrade includes the following activities:

- Modify screen at pump station;
- New screen and grit channels ahead of flow diversion chamber;
- Modifications at flow division chamber;
- De-sludge existing ponds;
- Construction of new primary pond;
- Construction of new evaporation pond;
- Temporary rehabilitation of flow links between ponds;
- Repair and extend security fence;
- Groundwater monitoring boreholes;
- Lining of existing primary ponds;
- Re-construction of flow links, overflow chambers and valve chambers between ponds.

Murraysburg WWTW: The oxidation ponds are unlined and the conditions of the pond walls are poor, with regular failures being experienced. A wall reinforcement or reconstruction project was completed with the DWS funding in the 2008/2009 financial year, but concern still exists. Animals excavating tunnels in the pond embankments and vegetation growth on the pond embankments continue to deteriorate the condition of the embankments for the ponds.

The WWTW site needs to be fenced to limit free access of animals and people to this potentially hazardous environment. Warning signs of drowning risks and unsafe water to drink and swim in should be added.

To ensure the oxidation ponds remain functional, it is proposed that the ponds be lined to ensure structural integrity and to limit pollution to surrounding farms and underlying watercourses. Regular removal of vegetation growth in the ponds needs to continue. Small quantities of chlorine can be dosed in the first oxidation pond after the anaerobic ponds to try to limit the algae growth.

A recent assessment of the hydraulic and organic loading design capacities of the WWTW indicated that the existing single primary pond at the WWTW is the limiting factor, with regard to required organic loading design capacity. Beaufort West Municipality therefore plans to upgrade the Murraysburg WWTW in the nearby future. The upgrade will include the following activities:

- Upgrade screen at offsite sewage pump station;
- Construct new inlet works;
- De-sludge anaerobic ponds;
- Upgrade / reconstruct anaerobic ponds;
- De-sludge primary ponds;
- Re-shape, line and change configuration to primary ponds;
- Cement stabilise unlined portion of pond embankments;
- Construct anaerobic- and primary pond linkages to suit new configuration;
- Construct irrigation network system to available budget;
- Install fencing and site lighting;
- Construct remaining linkages between ponds; and
- Construct disinfection system – if indicated by the effluent quality.

Beaufort West Municipality regularly review the capacity and suitability of the WWTWs to meet the requirements of DWS for the quality of the final effluent being discharged to the receiving water bodies. When the water quality requirements for the final effluent becomes stricter and / or when the inflow to the WWTW has increased to such an extent that the capacity of the plant needs to be increase, the Municipality appoints reputed consulting engineering firms to undertake feasibility studies to perform technical and economical evaluation of the different options available for upgrading or extending the capacity of the treatment works.

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

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

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

Asset Management Assessment:

A proxy for asset consumption can be considered the level of depreciation each asset incurs on an annual basis. Preserving the investment in existing infrastructure needs to be considered a significant strategy in ensuring the future sustainability of infrastructure and the Municipality's revenue base.

Beaufort West Municipality needs to differentiate between budget allocated towards the operation and maintenance of the water and sewerage infrastructure and the budget allocated towards the replacement of the water and sewerage infrastructure. A budget of approximately 2% of the total asset value per annum should be allocated towards the replacement of the existing water and sewerage 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 Beaufort West 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.

The AMP 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. Beaufort West Municipality must ensure that the maintenance and rehabilitation plan is part of the WSDP and that the plan is implemented. Assets must be rehabilitated and / or replaced before the end of their economic life and the necessary capital funds must be allocated for this purpose. The potential renewal projects for water and sewerage infrastructure need to be identified from the Asset Register. All assets with a condition grading "Poor" and "Very Poor" need to be prioritised.

Business Element 6: Water Services Infrastructure Management (O&M)

Table C.17 : Business Element 6: Operation and Maintenance (Topic 6)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
This topic provides an overview of the sufficiency of resources and processes in place to effectively operate and maintain the water services. It reflects whether the municipality has an Operation and Maintenance Plan in place. The topic also illustrates whether the WSA has implemented good practice as directed in the Blue- and Green Drop certification processes	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	Operation & Maintenance Plan	Scores will be finalised once the new eWSDP website is fully populated.			
	Resources				
	Information				
	Activity Control & Management				
	Water Supply & Quality				
	Waste Water Supply & Quality				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	It is important for Beaufort West Municipality to classify all the 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.
2	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 Beaufort West Municipality to compile a Legal Compliance Audit of their WTWs and WWTWs, which will provide the management of Beaufort West 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.
3	The Municipality's existing Water Quality Operational Sampling Programme needs to comply with the minimum SANS241:2011 monitoring frequency for process indicators.	Upgrade existing Operational Water Quality Sampling Programme in order to comply with SANS241:2011 requirements. Some additional microbiological samples also need to be taken on a monthly basis at Merweville.
4	All incidents need to be recorded and the specific Incident Management Protocols need to be followed.	All incidents at the WTWs and WWTWs and on the water reticulation networks and sewer drainage networks need to be recorded and the Incident Management Protocols, as included in the Water Safety Plan and W_2RAP, need to be followed.
5	Shortcomings were identified as part of the Water Safety Plan and W_2RAP.	Implement Improvement / Upgrade Plans of the Water Safety Plan and W_2RAP

The Water Safety Plan and W_2RAP Teams of Beaufort West 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 Beaufort West Municipality to classify all the WTWs and WWTWs 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.

Beaufort West Municipality is also committed to manage and operate sewage pump stations effectively to prevent any possible spillages. It is important for Beaufort West 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.

It is important for Beaufort West Municipality to establish a mentoring role for operators ensuring an adequately trained and classified workforce with dedicated training programmes for supervisors and operators. Budgets also 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 Beaufort West Municipality to compile a Legal Compliance Audit of their WTWs and WWTWs, which will provide the management of Beaufort West Municipality with the necessary information to establish whether the Municipality is in compliance with the legislation or not.

Beaufort West Municipality is committed to work with the DWS and the other role-players in order to improve on their 2014 Blue Drop Score for the various distribution systems. The Improvement / Upgrade Plan, which was compiled as part of the Water Safety Plan process, will be implemented in order to address the potential risks identified through the Water Safety Plan process.

Beaufort West Municipality is also committed to work with the DWS and the other role-players in order to improve on their 2013 Green Drop Score and to reduce the Wastewater Risk Ratings for the various WWTWs and to get the Municipality ready for the next round of assessments. The W_2RAP that are in place for all the WWTWs will assist in reducing the current CRRs for the various WWTWs. The following will also further assist in the process of reducing the CRRs.

- 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 support 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.

Business Element 7: Associated Services

Table C.18: Business Element 7: Associated Services (Topic 7)						
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**					
This topic has been established to ensure adequate focus on the water services levels and needs of educational and health facilities. The water services planner will use this information to establish short-term solutions and to prioritize water services infrastructure projects to educational- and health facilities.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**	
	Water services – Education	Scores will be finalised once the new eWSDP website is fully populated.				
	Water services - Hospitals					
	Water services – Health Centers					
	Water services - Clinics					
	Sanitation - Education					
	Sanitation - Hospitals					
	Sanitation – Health Centers					
	Sanitation - Clinics					
	TOTAL for Topic					
Problem Definition Statements						
Nr	**Statements - Short Comings**	**Possible Improvement / Project**				
1	-	-				

Education: All education facilities in Beaufort West Municipality's Management Area are provided with adequate water services and no specific strategies, with regard to the provision of water services to these facilities, were therefore identified. Beaufort West Municipality is however committed to work with the Education Department to address any possible shortcomings with regard to the provision of water services that might exist.

Health: The environmental health function is currently with the Central Karoo District Municipality. Typical functions of the Central Karoo District Municipality, with regard to health services, include the following:

- Households to meet the minimal health and safety requirements
- Monitoring water quality (Including recreational waters)
- 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 Central Karoo 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 Central Karoo District Municipality and Beaufort West Municipality with regard to environmental health issues and that a good communication protocol is followed between the District Municipality and Beaufort West Municipality.

The health profile in relation to treated water is good. Within the urban context, drinking water throughout the municipal area is considered to be of a high quality. The most vulnerable groups within Beaufort West Municipality's Management Area are the persons living in informal areas with shared services. It is therefore of outmost importance that the communal standpipes are properly maintained, to promote better health and hygiene among users. It is necessary to:

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

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

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

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.

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

Beaufort West Municipality will therefore endeavour to improve their efforts to foster partnership-driven development in planning and implementation where partnerships include community members, CBOs, NGOs, the private sector and other spheres of government. In this regard the Department of Health is considered a particularly important partner whose collaboration is much needed.

Business Element 8: Conservation and Demand Management

Table C.19: Business Element 8: Conservation and Demand Management (Topic 8.1)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
The topic provides an overview of the activities pursued by the WSA in the past financial year towards water conservation and demand management. It also contains an overview of the water sources of the WSA.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	Reducing unaccounted water and water inefficiencies	Scores will be finalised once the new eWSDP website is fully populated.			
	Reducing high pressures for residential consumers				
	Leak and meter repair programmes				
	Consumer/end-use demand management				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	The existing NRW for all the systems are extremely high.	Implement newly developed WC/WDM Strategy. Ensure all consumer connections are metered, water meters are accurate and that the new financial system record the free basic water, as well as all pre-paid water.
2	The meters that need to be replaced or repaired were identified through the detail water meter audits.	Start with the phased pro-active replacement of the old water meters. The faulty meters and the meters with existing leaks need to be replaced first.
3	It is important for Beaufort West Municipality to continue with the implementation of their Leakage Management Programme (Measure the volume of water that is lost, Identify and quantify losses, Conduct operational and network audits, Improve performance: network upgrade, design actions plans and sustain performance with good staffing / organization structures).	Actively implement the existing WC/WDM Strategy measures and the planned future measures. Ensure that adequate funding is allocated under their Capital and Operational budgets towards the implementation of the WC/WDM initiatives.
4	The WC/WDM Strategy of Beaufort West Municipality and the comprehensive list of WDM activities included in the WSDP needs to be used by Beaufort West Municipality to prioritise those activities that can be implemented within the available funding and personnel resources of the Municipality.	Prioritise from the list of WDM activities those activities that can be implemented with the available budget and personnel and the activities which will have the biggest impact.
5	Leak detection should be conducted by means of a specialized leak detection company in areas of high MNF. The activity can be performed after the MNFs were calculated and the specific areas with high MNFs were determined.	Continue with the calculation of MNFs for the different zones and implement leak detection for areas with high MNFs.
6	Beaufort West Municipality needs to investigate all leaks at domestic properties in poor areas with consumption above 15 kl / month.	Implement leaks repair assistance programmes in poor areas.
7	Implement an extensive schools WDM programme. Schools should be encouraged to make WDM programmes part of a long term project, where learners should be actively involved.	Beaufort West Municipality can focus on the implementation of an extensive schools WDM programme, which can include annual competitions between schools (Say with a prize for the lowest consumption, the lowest per capita consumption and for the best WDM Strategy poster design, etc.). A schools WDM programme should receive a high priority.
8	Beaufort West Municipality needs to continue to focus on the installation of water saving devices (specific water efficient toilets). The Municipality also needs to focus on raising awareness regarding conservation projects and the installation of water efficient devices in order to reduce the water demand and their percentage of non-revenue water.	In order to reduce the water demand and the percentage non-revenue water in the future it is important for the Municipality to raise awareness regarding conservation products and the installation of these products.

Table C.20: Business Element 8: Conservation and Demand Management - Water Balance (Topic 8.2 & 8.3)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
The topic provides an overview of the activities pursued by the WSA in the past financial year towards water conservation and demand management. It also contains an overview of the water sources of the WSA.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	Surface water purchased	Scores will be finalised once the new eWSDP website is fully populated.			
	Surface water abstraction				
	Ground water abstraction				
	Raw water supplied				
	Total Influent				
	Total treated TW				
	Potable water to other Neighbours				
	Purchased Treated water				
	Ground water not treated				
	Authorised consumption				
	Total losses				
	Billed unmetered				
	Apparent losses				
	Waste water treatment works				
	Recycled				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	Water Balance data is not available for Murraysburg	Ensure meters are installed at all the boreholes and that readings are regularly taken, as well as at reservoirs.
2	Murraysburg WWTW's flow is not monitored	Ensure a flow meter is installed at the new inlet works of the WWTW, once upgraded.
3	WWTW flow meter readings are not available for Merweville	Install a flow meter at the Merweville WWTW if there is not already a flow meter.

Beaufort West Municipality has responded to the need to address water losses and NRW within their jurisdiction by developing a Long-Term WC/WDM Strategy and actively implementing specific WC/WDM measures to reduce the current extremely high percentage of NRW and improve the water use efficiency within the various distribution systems. The table below gives an overview of the current NRW and the commitment w.r.t the reduction of NRW over the next number of years.

Table C.21: Commitment for the reduction in NRW			
Distribution System	**2014/2015 (%/a)**	**2019 (%/a)**	**2039 (%/a)**
Beaufort West	52.0% (25% Used in Model)	20.0%	15.0%
Merweville	45.3%	30.0%	15.0%
Nelspoort	74.8% (45% Used in Model)	30.0%	15.0%
Murraysburg	Water Balance Model not yet in place		

All surface and groundwater sources are supplied with bulk water meters, which are read monthly. Beaufort West Municipality is also currently busy with the establishment of comprehensive water management zones in Beaufort West, which will enable the Municipality to better monitor and manage their NRW. The comprehensive set of bulk meter readings of Beaufort West Municipality enables the Municipality to monitor their NRW accurately and to identify the specific areas for the implementation of WC/WDM activities in order to address the specific problems causing high NRW.

The Long-Term WC/WDM Strategy was approved by Council and the way forward for Beaufort West Municipality with the implementation of their newly developed WC/WDM Strategy is as follows:

- Allow for budget required to implement the various measures;
- Implement projects as required;
- Set up KPIs;
- Monitor the impact of WC/WDM measures and KPIs; and
- Review WC/WDM Strategy as necessary.

Beaufort West Municipality continues with the implementation of their pipeline replacement programme for all the priority areas with old reticulation networks and frequent pipe failures. It is important for Beaufort West Municipality to also continue with the implementation of their Leakage Management Programme (Measure the volume of water that is lost, Identify and quantify losses, Conduct operational and network audits, Improve performance: network upgrade, design actions plans and Sustain performance with good staffing / organization structures).

The MNFs will be monitored for specific zones in order to identify areas for the implementation of specific WDM measures (Pressure Management, Repair of leaks, etc.) The minimum night flow / average daily demand ratio needs to be used to prioritize leak detection for cost effectiveness (Note: 80% of losses come from 20% of leaks). Leak detection should be conducted by means of a specialized leak detection company in areas of high MNF. The activity can be performed after the MNFs were calculated and the specific areas with high MNFs were determined. The leakage management programme should focus on system operations by considering each of the following:

- **Raw water supply and treatment.** The focus should fall on bulk water metering, reduced filtration loss at the WTWs and staff training.

- **Distribution system:** The focus should fall on pressure management, leak repair, consumer metering and billing and staff training.

- **End-users.** The focus should fall on awareness campaigns (to encourage high-income users to reduce on-property leaks) and on water audits and leak repair at individual properties (for low-income users in the free-basic water category).

All consumer water meters that are not working or leaking should be replaced or repaired immediately and a phased approach should be followed for the replacement of all old water meters. Replacing all meters after a certain age is not economically feasible and a more sophisticated approach needs to be developed and implemented, which recognises that certain meters under certain conditions may be accurate for several more years than others.

A rough estimate of the number of meters that need to be replaced every year is the number of meters divided by 12, assuming that the life of the meters is not more than 12 years. Although it is assumed that the average lifespan of a meter is 12 years for budgeting purposes, it is necessary to carry out research to determine the most optimal replacement of age for each type of meter in various circumstances. The research should identify the different types of meters, in different pressure zones and carry out accuracy tests for a number of samples at different ages. In this way a policy can be developed of when each type of meter under various circumstances should be replaced. It is also recommended that, where deemed necessary new meters should be specified with AMR capacity to allow for remote meter reading. Such meters will assist in reducing meter-reading errors significantly.

The monthly consumption of all consumers should be checked to immediately identify a problem meter (where a reading suddenly becomes very high) and have it inspected. This will ensure that faulty or leaking meters are replaced as soon as possible and thus resulting in less water wastage and a greater income for the Municipality. Volume controllers can also be installed in areas where people cannot afford to pay for water. This ensures less water being wasted in the event of a leak or a tap left running.

The 2012/2013 Water Meter Audit in Beaufort West indicated that a total of 686 houses are currently with no water meter or the meter is faulty. The recommendations from the detail Water Meter Audit were as follows:

- The Water Meter Audit needs to be extended to also include the other areas in BWM's Management Area (Murraysburg, Merweville and Nelspoort).
- All meters removed or by-passed need to be replaced and repaired.
- All faulty meters need to be repaired immediately.
- The billing system for indigent supply by pre-paid water meters and billed by journal must be stopped immediately.
- Free water for indigents, with prepaid water meters, needs to be supplied by a token "selling". This will mean that the volume of water will be recorded correct in the Financial System.
- The engineering token must be reprogrammed so that the pre-paid meter can be programmed before free water is sold by the tag, in conjunction with the change in billing system.

An extensive schools programme, which might also include annual competitions between schools (say with a prize for the lowest consumption, the lowest per capita consumption and for the best WDM-strategy poster design, etc.) needs to be implemented. 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. A schools WDM programme should receive a high priority.

A Leak Repair and Assistance Programme that investigates and repairs leaks at all domestic households in low cost housing developments and poor areas with consumption above 15 kl / month should be implemented. Mechanisms for ensuring the customer repairs new water leaks, maintains an affordable consumption and does not build up arrears need to be addressed in the early stages of such a project, in order to ensure a sustainable solution (on-going water and cost savings) is achieved. The consumptions of the repaired properties need to be monitored so that rapid action can be taken should leaks re-occur. Further efforts should be made to ensure that those who qualify as "Indigent" on an income basis will also qualify on a water consumption basis.

Beaufort West Municipality also needs to focus on raising awareness regarding conservation projects and the installation of these products in order to reduce the water demand and their percentage of NRW. The use and installation of these fittings should be included as a condition for the approval of building plans as well as provided for in the Water Services Bylaws.

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.

Beaufort West Municipality is committed to continue with the allocation of budget towards the implementation of their WC/WDM Strategy. The 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 Beaufort West Municipality for this purpose should be sourced.

Beaufort West Municipality's current water information database appears adequate from a water services management perspective. The Municipality is committed to continue with the metering of all the influent received at their WWTWs, the quantity of treated effluent re-used and the quantity of treated effluent returned to the Water Resource System. This information is critical for planning purposed with regard to WWTWs upgrading.

Beaufort West Municipality is also committed to keep on updating the water balance models on a monthly basis in order to determine locations of wastage and to enable Beaufort West Municipality to actively implement their Long-Term WC/WDM Strategy to reduce the percentage of NRW and water losses. 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.

Business Element 9: Water Resources

Table C.22: Business Element 9: Water Resources (Topic 9)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
The volumes and sources of raw water supply to the WSA are presented in this topic, which also presents the status of the WSA's abstraction licenses and future needs. An overview of the WSA's monitoring programme for its raw water sources is presented. The topic also outlines the degree of industrial and 'raw' water use and effluent discharge within the WSA.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	Sources and Volumes	Scores will be finalised once the new eWSDP website is fully populated.			
	Monitoring				
	Water Quality				
	Wet Industries				
	Raw Water consumers				
	Industrial Consumer Units				
	Permitted effluent releases				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	Yield of existing resources are inadequate to meet long-term future water requirements of Beaufort West.	Continue with the planned augmentation of Beaufort West groundwater resources.
2	The dropping water levels observed over the past few years at the wellfields, and in particularly Brandwag, are disconcerting and need to be addressed.	Investigate the potential for recharge to increase the groundwater storage. Water in times of water surplus can be used to recharge aquifers thereby increasing their storage prior to the low rainfall periods.
3	Continue with the active implementation of the existing Groundwater monitoring programme.	Ensure that the key groundwater management functions are implemented. The monitoring data must be analysed by a geohydrologist on an annual basis in order to assess the effects of abstraction and recharge on the boreholes and aquifer. Groundwater monitoring must continue on at least a monthly basis. Monthly monitoring of water levels, water chemistry and abstraction must be conducted by the Municipal staff. Beaufort West Municipality needs to ensure that all electronic data (i.e. dataloggers) are downloaded once quarterly by a geohydrologist. Monitoring data must be annually reviewed by a geohydrologist.
4	Effluent monitoring (Quality and quantity) needs to be implemented for three abattoirs in Beaufort West.	All industrial consumers need to apply for the discharge of industrial effluent into the sewer system. The quality of effluent discharged from the three abattoirs needs to be monitored in order to determine whether it comply with the quality standards included in the Municipality's Bylaw.

Metering of all water supplied is one of the most significant steps in order to properly plan and manage water sources. Without metering no management is possible. Beaufort West Municipality needs to continue with the monthly reading of all their existing bulk water meters, which is a valuable source of information.

The uncertainty in projected water-related climate change impacts is one of the biggest challenges facing water managers. The managers must understand how this uncertainty influences the management decisions to be made and that decisions must be appropriate to a possible range of scenarios. A critical tool in this regard is adaptive management, in which water resource systems are carefully monitored and management actions are tailored and revised in relation to the measured changes on the ground. One cannot predict climate change impacts with any certainty, and the recognition of this uncertainty must be built into all climate change response strategies.

Detail future water requirement projection models were developed for each of the distribution systems in Beaufort West Municipality's Management Area. These models include the future projections up to 2039 and were calibrated by using historic consumption data and bulk abstraction data. The projected future water requirements are indicated in the table below for each of the systems.

Table C.23: Projected future water requirements per distribution system

Distribution System (Yield)	Model	PROJECTED FUTURE WATER REQUIREMENTS (Ml/a)				
		2019	2024	2029	2034	2039
Beaufort West (Yield 3 556.936 Ml/a)	2% Annual Growth	2 932.982	3 238.249	3 575.288	3 947.407	4 358.257
	3.5% Annual Growth	3 155.079	3 747.244	4 450.551	5 285.858	6 277.941
	WSDP Model	**2 674.477**	**2 823.212**	**2 982.215**	**3 152.241**	**3 334.101**
	Yield surplus (+) / shortfall (-)	**+ 882.459**	**+ 733.724**	**+ 574.721**	**+ 404.695**	**+ 222.835**
Merweville (Yield 322.464 Ml/a)	1% Annual Growth	124.148	130.481	137.137	144.133	151.485
	2% Annual Growth	130.417	143.991	158.978	175.525	193.793
	WSDP Model	**98.361**	**99.524**	**100.988**	**102.739**	**104.769**
	Yield surplus (+) / shortfall (-)	**+ 224.103**	**+ 222.940**	**+ 221.476**	**+ 219.725**	**+ 217.695**
Nelspoort (Yield 411.670)	1% Annual Growth	181.990	191.273	201.030	211.284	222.062
	2% Annual Growth	191.179	211.077	233.047	257.302	284.082
	WSDP Model	**143.815**	**142.540**	**141.664**	**141.145**	**140.949**
	Yield surplus (+) / shortfall (-)	**+ 267.855**	**+ 269.130**	**+ 270.006**	**+ 270.525**	**+ 270.721**
Murraysburg	1% Annual Growth	Historical measured raw water data is not available to accurately project the future water requirements.				
	2% Annual Growth					
	WSDP Model					
	Yield surplus (+) / shortfall (-)					

The table below gives an overview of the years in which the annual water requirement is likely to exceed the safe yields from the various resources.

Table C.24: Years in which the annual water requirement will exceed the sustainable yield from the various resources

Distribution System	Total sustainable Yield (x 10^6 m^3/a)	Annual Growth on 2014/2015 Demand (1% or 2%)	Annual Growth on 2014/2015 Demand (2% or 3.5%)	WSDP Projection Model
Beaufort West (Incl. Hansrivier and Small Hansrivier)	3.557	2028 (2%)	2022 (3.5%)	> 2039
Merweville	0.322	> 2039 (1%)	> 2039 (2%)	> 2039
Nelspoort (Incl. Weir borehole)	0.412	> 2039 (1%)	> 2039 (2%)	> 2039
Murraysburg (Incl. MB Rugby Bh3 & MB Hostel Bh4)	0.198	Future Water Requirement Projection Model not yet in place		

The existing water sources in Beaufort West are under constant pressure to meet the future water requirements and further exploitation of additional groundwater resources is taking place.

GEOSS was tasked to conduct several hydrogeological investigations to identify areas where additional groundwater could be sourced for Beaufort West town supply. A water balance study carried out by GEOSS during 2007 estimated that the current municipal well fields of Beaufort West are already over utilised and that no additional groundwater is available for further development. The latter resulted in a wider regional hydrogeological assessment that could possibly identify new areas for groundwater development.

The reliance on groundwater supply for the towns of Beaufort West, Merweville and Nelspoort highlights the need for Beaufort West Municipality to keep on focussing on aquifer protection, groundwater monitoring and well-field management. Additional water sources need to be identified for Beaufort West to enable the town to meet its water demand particularly in times of low groundwater recharge.

Based on the investigations conducted by GEOSS the following were recommended in their *"A Regional reconnaissance investigation to identify areas for groundwater development in Beaufort West, May 2007"* Report:

- Proceed with the utilisation of Brandwag 5. Brandwag 5 must be pumped at a maximum yield of 2.0 l/s for 12 hours – short term option **(Was started by Beaufort West Municipality in November 2007**).

- Conduct a monthly water quality monitoring programme together with the routine monthly water level monitoring– short term option **(Implemented by Beaufort West Municipality)**.

- Re-drill a new borehole next to G29877L; Pump test the newly drilled borehole and scientifically assess its groundwater potential; Assess the Droërivier area to determine whether there are any existing boreholes that can be used for augmentation; Depending on the outcome of the assessment, decide to site and drill additional boreholes here – short term option **(Implemented by Beaufort West Municipality)**.

- Conduct a groundwater exploration programme to source additional groundwater in sub areas D, B, C and A in order of priority – medium term option **(Busy with implementation).**

- Consider the desalinisation of treated sewage water – medium term option **(Implemented by Beaufort West Municipality).**

- Investigate future desalinisation options in the eastern parts of the Hans River cadastral farm property – medium term option **(Implemented by Beaufort West Municipality).**

- Investigate future desalinisation options in the Lower Plaatdoorns area – long term option.

In essence, the Beaufort West water supply is in a dire situation. The groundwater levels in the vicinity of production boreholes are dropping by an average of 1m per year. This is due to a combination of over-abstraction and reduced groundwater recharge. Over the past eight years the rainfall has been below the long term average (267mm/a) for seven of those years. The groundwater from the town wellfield is the best of all the wellfields, yet it is the most prone to contamination from anthropogenic sources.

In October 2011, GEOSS completed a hydrocensus as the first step in the medium to long term groundwater development for the town of Beaufort West. The hydrocensus targeted three areas (Target Area 1, 2 and 3) and found the most favorable target area to be Target Area 3, an area south of the town including the farms Steenrotsfontein and Lombaard's Kraal. Target Area 3 was identified as the most favorable target area based on its proximity to the town, the relatively high groundwater potential and the support of the two farmers concerned (namely Natie Nel and Ian Taylor). Numerous boreholes exist in this area, as well as undeveloped land with the potential for geophysical groundwater exploration. Target Area 3 was therefore targeted first, with Target Areas 1 (Renosterkop) and 2 (along the south western border of the Karoo National Park) possibly targeted at a later stage, depending on obtained results and available budget.

The recommendations and considerations included in the GEOSS's *Hydrocensus Report (26 October 2011)* pertaining to the further development of groundwater resources, were as follows:

- It is of paramount importance that permissions are put in place prior to commencing groundwater exploration and development on the farmer's land.

- There are two springs in the area identified for groundwater exploration; these reportedly did not dry up during the previous year's dry summer months. There are groundwater dependant ecosystems linked to these springs and Ian Taylor stated that animals drink at the spring on his farm during the dry water scarce periods. For this reason it is important that monitoring of these springs takes place prior to borehole drilling and abstraction. This will enable an evaluation of whether borehole abstraction does impact the springs in the case that this accusation is made in the future. Any drilling of boreholes must also not result in any surface-based contamination affecting these springs and best practice drilling measures must be implemented.

- Geophysics should be conducted in order to identify suitable drilling targets for boreholes at the identified land in Target Area 3. Once the driller has been appointed these borehole sites can be drilled.

- Existing boreholes on the relevant farmer's land that have been identified as possible municipal supply boreholes can be tested for yield and quality.

- Dependant on the success of the groundwater exploration and development at Target Area 3 and available budget other target areas can be considered. Target Area 2, despite being located relatively far from Beaufort West and having numerous farmers opposed to municipal abstraction, appears to offer some targets for groundwater exploration. Borehole sitings can take place along the road if permission from land owners is a problem.

- The high yielding borehole at Renosterkop can be considered for Municipal supply should the problems related to the very poor water quality be dealt with. Wallie Nigrini, the land owner, has stated that he is prepared to make this borehole's water available to Beaufort West. This borehole must be pump tested.

- In addition to developing more groundwater resources it is advised that Beaufort West Municipality considers managed or artificial recharge to increase the groundwater storage. The dropping water levels observed over the past few years at the wellfields, and in particularly Brandwag, are disconcerting and need to be addressed. Artificial recharge has been successfully implemented in other South African low rainfall areas. The means of artificial and managed recharge can vary but the concept is relatively simple and involves using water in times of water surplus (as recently experienced in Beaufort West) to recharge aquifers thereby increasing their storage prior to the low rainfall periods.

Following on from the recommendations of the Hydrocensus Report, GEOSS was appointed to conduct borehole drilling and testing at locations sited based on the hydrocensus and geophysics. A total of nine boreholes were drilled, and a total of 11 boreholes (newly drilled and existing) were identified for yield testing. With the exception of borehole RK1 (Target Area 1) all the drilled and tested boreholes are located in Target Area 3. Of the 11 boreholes identified for testing, only 4 boreholes had sufficiently high yields and sufficient recovery to be utilised. In addition to these, there are an additional 2 existing boreholes in the Target Area 3 which have been tested previously (GEOSS, 2011) and can be utilised as a groundwater source.

The six (6) future production boreholes are indicated in the table below.

Table C.25: Further potential production boreholes drilled in Beaufort West

New Production Boreholes	Recommended yield (l/s)	Pump duration (Hrs)	EC (mS/m)	Comment
RK1	4.6	16	445	Borehole quality quite poor. High yielding
SR5	4.5	16	285	High yielding borehole
SR4	4.5	16	253	High yielding borehole
SR9	2	16	240	Good recovery
QA2	3	16	83	Existing borehole (GEOSS, 2011)
SR10	5	16	182	Existing borehole (GEOSS, 2011)

The recommendations and considerations included in GEOSS's *"Medium and Long Term Groundwater Development for Beaufort West, 20 June 2012"* Report, are as follows:

- 6 Boreholes can be equipped and utilised at the recommended rate pumping of 16 hours per day and resting for 8 hours per day.

- The groundwater is very hard and should preferably be treated prior to use. Borehole RK1 has a poor water quality and would definitely require some form of treatment prior to municipal use.

- In addition to developing more groundwater resources it is advised that Beaufort West Municipality considers managed or artificial recharge to increase the groundwater storage. The dropping water levels observed over the past few years at the wellfields, and in particularly Brandwag, are disconcerting and need to be addressed. Artificial recharge has been successfully implemented in other South African low rainfall areas. The means of artificial and managed recharge can vary but the concept is relatively simple and involves using water in times of water surplus (as recently experienced in Beaufort West) to recharge aquifers thereby increasing their storage prior to the low rainfall periods.

- While some geophysics was carried out at Target Area 2, the lack of support from the farmers and access restrictions limited the study. Further investigations and exploration can be done in this area if permissions are obtained from local land owners.

Murraysburg:

GEOSS was also appointed to analyse yield test and chemistry data for two boreholes at Murraysburg. Park_BH1 is an existing borehole at the Park and Rugby_BH3a is a re-drilled borehole at the rugby fields, drilled a few meters from the existing blocked borehole, Rubgy_BH3. The results of the pumping test analysis are summarised in the table below.

Table C.26: Pumping test results for two boreholes tested in Murraysburg

Borehole	Recommended yield (l/s)	Pump duration (Hrs)
Park_BH1	1.5	16
Rugby_BH3a	3.8	16

A complete geohydrological exploration with geophysics should be completed if additional groundwater resources are to be developed in Murraysburg.

The DWS also updated their 2010/2011 All Towns Reconciliation Strategies during 2015 and the table below gives an overview of the recommended potential future water resources as included in the updated All Towns Reconciliation Strategies of Beaufort West Municipality:

Table C.27: Potential future water resources for the various towns (DWS's All Towns Reconciliation Strategies)

Distribution System	Option	Potential
Beaufort West	Re-use of water	• The reclamation plant is fully operational and the Municipality continue to use the plant on a daily basis. The re-use of the treated effluent is therefore a suitable resource for Beaufort West. • The hydraulic capacity of the reclamation plant is currently 1.210 Ml/day and the Municipality will continue to upgrade the capacity at 10% per year up to 2.100 Ml/day.
	Groundwater	Continue with the development of the following six future production boreholes: • RK1: Recommended yield 4.6 l/s (water quality quite poor, high yield) • SR5: Recommended yield 4.5 l/s (high yield) • SR4: Recommended yield 4.5 l/s (high yield) • SR9: Recommended yield 2 l/s (good recovery) • QA2: Recommended yield 3 l/s (existing borehole) • SR10: Recommended yield 5 l/s (existing borehole).
	Surface Water	• The Gamka Dam is the only major dam located in close proximity to Beaufort West and it is already fully utilised.
	Other Sources	• Rainwater harvesting is not a suitable option for the area, because the mean annual precipitation is considered too low.
	Summary	**The current water supply will meet the future water requirements for all growth scenarios if the implementation of the WC/WDM Strategy is successful. The following interventions are recommended for implementation, in order of priority and implementation sequence:** • Full implementation of the WC/WDM Strategy. • Integration of recently drilled and developed boreholes. • Development and implementation of integrated operating rules for the dam, the wellfields and the reclamation scheme to possibly increase the yield of the whole system. • Further incremental groundwater development.

Table C.27: Potential future water resources for the various towns (DWS's All Towns Reconciliation Strategies)		
Distribution System	**Option**	**Potential**
Merweville	Re-use of water	• The provision of treated waste water as irrigation water to nearby farm holdings and for recreational purposes is not a feasible option owing to the relatively low yield and current treatment processes at the WWTW.
	Groundwater	• Merweville relies entirely on groundwater supplied by seven boreholes that are situated within the Abrahamskraal Formation. No future water shortfalls up to 2040 are expected. • The Abrahamskraal Formation is the only geological unit that can be targeted in the region for groundwater, and hence similar yields (0.5 l/s per borehole) and water qualities (Class 2-3 due to the dominant mudstone lithology) can be expected if further boreholes are drilled for the town supply. Slightly higher yields may be present at the intersection of the river course (possible NNE-SSW orientated fracture) and the E-W orientated syncline (possible increased fracturing along the fold axis). Desalinisation of the groundwater may be required in some instances to make it potable.
	Surface Water	• As the current sources are more than adequate to cater for future water requirements, additional and optional surface water sources have not been considered in detail. However the Vanderbijlskraal River could be considered as a potential source in the future when the requirement exceeds the current source supply. • The Vanderbijlskraal River runs through the town but this river appears to be non-perennial and direct abstraction throughout the year will not be an option. It may, however, be possible to abstract water from the Vanderbijlskraal River in the summer months when the river is flowing, store this water and subsequently use this to recharge the boreholes on which Merweville relies. The quality of water in the river is unknown and therefore pre-treatment may be required.
	Other Sources	• Rainwater harvesting is not a suitable option for Merweville, considering the low MAP of the area.
	Summary	**The yields from the existing groundwater resources are adequate to meet the future growth scenarios. The existing water losses and NRW for the town are however extremely high, and there should be a major drive to reduce the existing losses. The following interventions are recommended for implementation, in order of priority and implementation sequence:** • Full implementation of the WC/WDM Strategy measures. • Further Groundwater development • Artificial recharge of groundwater from Vanderbijlskraal River.
Nelspoort	Re-use of water	• The provision of treated waste water as irrigation water to nearby farm holdings and for recreational purposes is not a feasible option owing to the relatively low yield and current treatment processes at the WWTW.
	Groundwater	• Nelspoort currently makes use of two existing boreholes and the Municipality is busy to connect a third newly drilled borehole to the existing network. The only NGDB registered boreholes in the vicinity of the town are present within the Teekloof Formation, and it is presumed the town boreholes intersect the same geological unit. • There are no predicted future water shortfalls for Nelspoort, with the newly drilled borehole incorporated. The intrusive contact zone between the Teekloof Formation and inclined dolerite sills can also be targeted to the north and north-east of Nelspoort if further water resources are required. Yields are also likely to be in the range of 1-2 l/s, although water quality is likely to be poor due to the mudstone-rich nature of the Teekloof Formation. Desalinisation of the groundwater may therefore be required in some instances to make it potable.
	Surface Water	• The Sout River runs through Nelspoort and is one of the major water sources for the town. No information is available on whether more water could be abstracted from the river and thus further investigation is required.
	Other Sources	• Rainwater harvesting is not a suitable option for Nelspoort, considering the low MAP of the area.
	Summary	**The current water sources have adequate supply to cater for the medium and longer-term future water requirements. However existing water losses and NRW for the town are extremely high and there should be a major drive to reduce existing losses. The following interventions are recommended for implementation, in order of priority and implementation sequence:** • Full implementation of the newly developed WC/WDM Strategy. • Incremental groundwater development. • Further abstraction from the Sout River.
Murraysburg	Re-use of water	• Water re-use is not a feasible augmentation option, since the wastewater treatment process relies on evaporation ponds, where the return to the system is effectively zero.
	Groundwater	• Murraysburg currently makes use of five boreholes, which are stated to be near the river and most likely target the Quaternary alluvium. The total yield from these five boreholes is given as

Table C.27: Potential future water resources for the various towns (DWS's All Towns Reconciliation Strategies)		
Distribution System	**Option**	**Potential**
		1 234 kl/d (0.450 million m³/a). • The Quaternary alluvium could be targeted again if additional water is needed, provided any future boreholes are situated away from the current boreholes, in order to prevent water-level drawdown interference. The intrusive contact between dolerite dykes/inclined sills and the Teekloof Formation could also yield 1-2 l/s boreholes. This would require geophysical sitting however, in order to determine the position of the intrusive contact zone. Water quality may also be poorer in comparison to the alluvial aquifer, due to the mudstone-rich nature of the Teekloof Formation.
	Surface Water	• The non-perennial Buffels River is located on the outskirts of Murraysburg. Considering that this is a non-perennial river, there may be potential to recharge surrounding boreholes by abstracting seasonal flows from the river into an off-channel storage facility. This option will require further investigation, and be highly dependent on the minimum annual flow that can be assured.
	Other Sources	• Rainwater harvesting is not a suitable option for Murraysburg as the rainfall is very little.
	Summary	**If the implementation of the Water Conservation and Water Demand Management Strategy measures is successful to reduce water consumption by more than 20%, the current yield should be adequate to cater for the future water requirements. The following interventions are recommended for implementation, in order of priority and implementation sequence:** • Implement WC/WDM Strategy measures. • Compile a drought plan, monitor abstraction and recharge against preset warning points and manage the borehole abstraction. • If and when needed a further borehole can be developed.

Water Quality:

The table below indicates the compliance of the E.Coli monitoring frequency in the water distribution systems of the Beaufort West Municipality, in terms of the minimum requirements of SANS:241-2: 2011 (Table 2). The period assessed was for samples taken from July 2014 to June 2015.

Table C.28: Current and required monthly sampling for E.Coli (or faecal coliforms) in the distribution systems			
Distribution System	**Population Served**	**Required number of monthly samples (SANS 241-2:2011: Table 2)**	**Average Number of monthly Microbiological samples taken by Mun during 2014/2015**
Beaufort West	35 641	7.1	12
Merweville	1 665	2	1
Nelspoort	1 750	2	2
Murraysburg	5 301	2	2.2

From the above table it can be noted that the number of microbiological samples taken by Beaufort West Municipality over the last year for the Merweville system was not adequate.

Operational monitoring of process indicators shall comply with the minimum requirement specified in SANS 241:2011 for characterising raw water quality, on-going levels of operational efficiency in a water treatment system and acceptable final water quality to the point of delivery, as summarised below.

Table C.29: Minimum monitoring frequency for process indicators (SANS241-2:2011: Table 1)			
Determinand	**Intake Water**	**Final Water**	**Distribution System**
Conductivity or total dissolved solids	Daily	Daily	-
pH value	Daily	Once per shift [a]	Fortnightly
Turbidity	Daily	Once per shift [a]	Fortnightly
Disinfectant residuals [b]	Not applicable	Once per shift [a]	Fortnightly
E.Coli (or faecal coliforms) [c]	Not applicable	Weekly	Fortnightly but dependent on population served [d]
Heterotrophic plate count [c]	Not applicable	Weekly	Fortnightly
Treatment chemicals	Not applicable	Weekly	Fortnightly
a: A shift is defined as an eight-hour work period.			

Table C.29: Minimum monitoring frequency for process indicators (SANS241-2:2011: Table 1)			
Determinand	**Intake Water**	**Final Water**	**Distribution System**
b: Disinfection shall be sustained at a value defined by the water services institution and water services intermediary throughout the distribution system such that the water services institution and water services intermediary ensure that all microbiological indicators listed in SANS 241-1:2011, table 1, are achieved on a continuous basis.			
c: If non-compliant with the numerical limits specified in SANS 241-1, implement corrective action and instigate immediate follow-up sampling at an increased sampling frequency.			

It can be noted from the above table and Table A.27 that the following additional operational samples need to be taken by Beaufort West Municipality.

- Beaufort West:
  - Conductivity of raw water needs to be taken daily.
  - Conductivity of final water daily.
  - E.Coli of final water weekly.
- Merweville, Nelspoort and Murraysburg:
  - Conductivity, pH and Turbidity of raw water need to be taken daily.
  - Conductivity, pH, Turbidity and Free Chlorine of final water daily.
  - E.Coli of final water weekly.
- All Distribution Systems: pH, Turbidity, Free Chlorine and E.Coli fortnightly.

Industrial Consumers:

Beaufort West Municipality is committed to ensure that all persons apply for the discharge of industrial effluent into the sewer system and that a specific set of parameters to be monitored for the discharge of industrial effluent into the sewer system of Beaufort West Municipality is compiled. The quality of industrial effluent discharged from the abattoirs will also be monitored, in order to determine whether the quality comply with the required standards and criteria.

The following gaps with regard to industrial consumers and their discharge of effluent into Beaufort West Municipality's sewer system were identified:

- Industrial effluent discharge into the sewer system needs to be metered.
- All persons to formally apply for the discharge of industrial effluent into the sewer system.
- Beaufort West Municipality's by-law, with regard to the discharge of industrial effluent into the sewer system, needs to be implemented.
- Regular sampling of the quality of industrial effluent discharged into the sewer system is necessary.
- Any returns from the industries direct to the Water Resource System needs to be metered.

Beaufort West Municipality is committed to ensure that all persons apply for the discharge of industrial effluent into the sewer system, to monitor the quality of industrial effluent and to ensure that the industrial consumers comply with the developed by-law, with regard to the discharge of industrial effluent into the sewer system (Consent to discharge industrial effluent, alternative disposal of industrial effluent, charges in respect of industrial effluent).

Business Element 10: Financial

Table C.30: Business Element 10: Financial Profile (Topic 10)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
The financial profile is aligned with the Water Services Standard Chart of Accounts [SCOA] which addresses the expenditure, revenue & capex for the water services function.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	Capital Expenditure	Scores will be finalised once the new eWSDP website is fully populated.			
	Operation and Maintenance Budget				
	Tariff & Charges				
	Free Basic Services				
	Metering, Billing, Income and Sales				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	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. Expenditure on repairs and maintenance does not keep track with the increase in asset values as well as the ageing of the infrastructure.	An Integrated Maintenance Plan is necessary that optimises maintenance activities, appropriate to its specific needs and the local environment, and identifies the systems and resources required to support this. A regime of planned preventative maintenance should be established for all infrastructure assets classified as critical and important in the Asset Register. Consideration should be given to the establishment of a maintenance management system to enable Beaufort West 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.
2	The Municipality needs to remain financially viable for the foreseeable future while also ensuring that current and future service delivery needs of the community are met.	Continue with the development, approving and implementation of the Long Term Financial Plan to address the health and financial performance of the municipality.
3	Beaufort West Municipality experience various financial challenges.	Improve credit control and debtors management in respect of overdue debtors and write off uncollectible debts. Implement strict revenue collection procedures. Implement processes to attract suitably skilled officials. Tighter budget control and further improve debt collection. Training and recruitment of skilled staff and capacitating personnel. Amend organogram and budget accordingly. Appointment of skilled staff and capacitating of existing staff and interns. Investigation options to simplify data retrieval. Grow the economy by attracting investments.
4	Sustain a satisfactory level of municipal services to the citizens of Beaufort West Municipality.	Implement the Financial Revenue Raising Strategies and Expenditure Management Strategies as included in the IDP.
5	Investigate the possibility of linking the sewerage tariffs to the volume of water use. Volumetric usage, whereby charges are determined according to water usage with maximum ceilings and charged accordingly.	Investigate the financial impact of linking the sewerage tariffs to the water usage.
6	It is important for Beaufort West Municipality to enforce their indigent qualification criteria rigorously in order to ensure that those who do not qualify are removed from the allocation list. The Municipality needs to determine whether the current Indigent Policy is not too generous and creates a situation where too many citizens in Beaufort West Municipality's Management Area are making no monetary contribution toward the cost of delivering services to the community.	Investigate the current indigent qualification criteria in order to determine whether the existing criteria is not too generous.

The major financial challenges for Beaufort West Municipality include the following:

- Filling of critical vacancies;
- Inability to attract certain skilled officials;
- Small revenue base;
- Cash flow problems;
- Grant dependency;

- Capacity shortages; and
- Low revenue collection.

Beaufort West Municipality achieved an average collection rate of 91.5% in 2014/2015. The financial viability challenges and actions to address these challenges were indicated as follows in the Municipality's 2014/2015 Annual Report.

Table C.31: Financial viability challenges and actions to address these challenges	
Challenge	**Action to address challenge**
The municipality recorded significant amounts of overdue debtors at year end.	Improve credit control and debtors management in respect of overdue debtors and write off uncollectible debts.
Low revenue collection.	Implement strict revenue collection procedures.
Capacity shortages and the inability to attract skilled officials.	Processes will be implemented to attract suitably skilled officials.
Financial Viability	Tighter budget control and further improve debt collection.
Lack of capacity in Budget and Treasury Office	Training and recruitment of skilled staff and capacitating personnel. Amend organogram and budget accordingly.
Difficulty with GRAP compliance	Appointment of skilled staff and capacitating of existing staff and interns.
Ineffective systems, management and data retrieval for reporting.	Investigation options to simplify data retrieval, e.g. migration to new systems or modules.
Low revenue base	Grow the economy by attracting investments.

Beaufort West Municipality's financial viability and management performance in terms of the National Key Performance Indicators is summarised in the table below (2014/2015 Annual Report):

Table C.32: Financial viability and management performance in terms of the National Key Performance Indicators		
KPA and Indicator	**2014/2015**	**2013/2014**
Debt coverage ((Total operating revenue-operating grants received):debt service payments due within the year)	33.3%	31.0%
Service debtors to revenue – (Total outstanding service debtors: revenue received for services)	38.3%	31.8%
Cost coverage ((Available cash + investments): Monthly fixed operating expenditure	1:0.5	1:0.7

Capital Budget:

Beaufort West Municipality in cooperation with the Provincial Treasury drafted a Long-Term Financial Plan to address the health and financial performance of the municipality. The long term plan must ensure that the municipality remains financially viable for the foreseeable future while also ensuring that current and future service delivery needs of the community are met. The municipality remains highly dependent on grants from National and Provincial Government to fund their capital budget.

The recommendations for Beaufort West Municipality, with regard to their Capital Funding, are as follows:

- To focus strongly on revenue collection, in order to improve the Municipality's own funding sources, because most of the funds for the current water and sewerage capital projects come from grants from National and Provincial Government. The Municipality also needs to actively implement their Credit Control and Debt Collection measures in order to minimize the percentage of non-payment of municipal services.
- To identify all possible sources of external funding over the next three years to assist Beaufort West Municipality to address the bulk infrastructure backlogs that exist in the various towns.
- 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. The renewals burden is set to increase sharply over the next 20 years and it is therefore important for Beaufort West Municipality to commit to a substantial and sustained programme of capital renewal works.

Operational Budget:

Services charges relating to electricity, water, sanitation and refuse removal constitutes the biggest component of the revenue basket of the Municipality's revenue budget. The Revenue Raising Strategies and Expenditure Management Strategies of Beaufort West Municipality is summarised in the table below:

Table C.33: Revenue Raising Strategies and Expenditure Management Strategies of Beaufort West Municipality

Revenue Raising Strategies	Expenditure Management Strategies
• The guidance on how to improve the payment ratio of the area can be found in the Credit Control and Debt Collection Policy. This Policy highlights the procedures to be followed in the collection of all moneys owed to the Municipality.	• To reduce expenditure on non-core functions, by considering Public Private Partnerships.
• To ensure through LED that employment opportunities are generated which will enable families to start paying for services.	• To limit operating and capital expenditure to essential items.
• To create a climate for investment in the area, this will in turn also generate employment opportunities.	• To investigate and limit water and electricity losses.
• To ensure that the figures in respect of families that qualify in terms of the indigent policy are correct so as to qualify for an increased amount from national government.	• To limit employee related expenditure, by introducing a fingerprint time and attendance system.
• To introduce a system through which services payment by employed people is guaranteed by having such payments deducted by their employers before salaries are paid out.	• To introduce a fleet management system to reduce fuel and other operating vehicle related costs.
• The installation of prepaid meters is essential in securing future payment for services by residents.	• To reduce interest and redemption expenditure by exploring alternative ways (possible grant funding) to pay off the long-term loans.
• To enlarge the revenue base of the municipality by ensuring that all properties are correctly zoned (The property rates tariffs are based on the zoning).	
• To enlarge the revenue base of the municipality, by implementing an alternative energy project where energy can be supplied to citizens and surplus fed into the grid, resulting in an on-going source of revenue for the municipality.	

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. Expenditure on repairs and maintenance does not keep track with the increase in asset values as well as the ageing of the infrastructure.

An Integrated Maintenance Plan is necessary that optimises maintenance activities, appropriate to its specific needs and the local environment, and identifies the systems and resources required to support this. A regime of planned preventative maintenance should be established for all infrastructure assets classified as critical and important in the Asset Register. Consideration should be given to the establishment of a maintenance management system to enable Beaufort West 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.

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

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

- The new depreciation charges will have to form part of the operating budget and subsequent tariffs, linked to a ring-fenced asset replacement fund.

- The operational income for water and sanitation services was more than the expenditure for the last two financial years. It is expected that this trend will continue in the future. It is critical for Beaufort West Municipality to ensure that sufficient funding is allocated towards an asset replacement fund, in order to ensure adequate rehabilitation and maintenance of the existing infrastructure. A financial sustainability strategy is necessary, which needs to include the implementation of an aggressive revenue management framework for ongoing revenue enhancement.

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

- Beaufort West Municipality needs to ensure that the Credit Control and Debt Collection Policy and By-laws are strictly enforced.

Tariff and Charges:

Beaufort West Municipality's current four block step water tariff structure adequately promotes the efficient use of water by consumers and discourages the wastage of water. Higher tariffs are charge for the higher consumption blocks.

The table below gives some comments on the specific blocks, with regard to Beaufort West Municipality's water tariff structure for the last three financial years.

Table C.34: Comments on the Municipality's block step tariff structure

Block (kl/month)	15/16	14/15	13/14	Comments
0 - 6	R10-21	R9-55	R8-93	Free Basic Water
7 - 15	R11-71	R10-95	R10-23	Low volume use
16 - 20				Typical use volume, including garden irrigation
21 - 30	R12-74	R11-90	R11-13	
31 - 50				Above average use, including garden irrigation
51 - 60	R13-96	R13-05	R12-18	
61 - 100				Wasteful use and/or severe garden irrigation
> 100				Significant waste and/or unnecessary garden irrigation

Wasteful or inefficient use of water is discouraged through increased tariffs. It is suggested that the following tariff structure characteristics should remain in Beaufort West Municipality's Structure in order to ensure efficient water use.

- Maintain a rising block tariff structure.

- Keep number of blocks in the tariff to a minimum. One block to address free basic water (the first step) and another to address the "cut-off" volume where consumers are discouraged to use water above this monthly volume (highest block) are required. In addition another three blocks could be used to distinguish between low users, typical use of high water use.

- The volumetric steps should be kept the same for all the areas within Beaufort West 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.

- Develop tariff codes, which adequately differentiate between the different types of consumers, for example residential, commercial, churches, schools, departmental, old age homes, etc.

The Municipality should investigate the possibility of volumetric usage for their sanitation tariffs, whereby charges are determined according to water usage with maximum ceilings and charged accordingly. Beaufort West Municipality will continue to re-evaluate the tariffs they charge for their water and sanitation services on an annual basis in order to put the Municipality in a better financial position to address the bulk infrastructure backlogs and to ensure the adequate rehabilitation and maintenance of all existing water and sewerage infrastructure within the various towns.

Beaufort West 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 Beaufort West Municipality's Indigent Policy and all indigent households receive free basic water and sanitation services.

It is important for Beaufort West Municipality to enforce their indigent qualification criteria rigorously in order to ensure that those who do not qualify are removed from the allocation list. The Municipality needs to determine whether the current Indigent Policy is not too generous and creates a situation where too many citizens in Beaufort West Municipality's Management Area are making no monetary contribution toward the cost of delivering services to the community.

It is important for Beaufort West Municipality to continue with the reading of all their bulk water meters. The bulk meters and meter chambers also need to be properly maintained and the meters need to be protected from possible vandalism. Beaufort West Municipality is committed to ensure that all water used for irrigation purposes are metered.

Beaufort West Municipality's Credit Control and Debt Collection By-laws provide a framework to enable Beaufort West Municipality to proactively manage and collect all money due for services rendered and outstanding property taxes, subject to the provisions of the Municipal Systems Act of 2000 and any other applicable legislation and internal policies of Council. The By-laws provides for credit control procedures which are fair and equitable, provide for warnings and adequate notice, provide for consumer representations, allow alternative payment arrangements and set out fair procedures that will be applied in the event of non-payment. The By-laws further allows for actions that will limit the Municipality's financial loss and promote good payment habits, where a consumer continues to fail to pay for services provided after the application of such procedures and a fair warning.

The Technical Department needs to continue to work with the Financial Department in order to ensure that all water used is metered, which include the free basic water, pre-paid water and also the water used for irrigation purposes on the parks.

Business Element 11: Water Services Institutional Arrangements

Table C.35: Business Element 11: Water Services Institutional Arrangements (Topic 11)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
The institutional arrangements profiles presents an overview of the WSA's compliance with respect to water services regulations and policy and as aligned also with the Regulatory Performance Monitoring System. It also provides an overview of the water services provider arrangements which are in place, including the WSA's perception of the sufficiency of WSP staffing levels.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	Policy development	Scores will be finalised once the new eWSDP website is fully populated.			
	Regulation and tariffs				
	Infrastructure development (projects)				
	Performance management and monitoring				
	WSDP				
	Bulk and Retail functions				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	All critical vacant water and sanitation positions as indicated on the approved Organogram needs to be filled as soon as possible. Beaufort West Municipality needs to review the skills needed at each of their 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.	Filling the vacant positions will ensure the adequate operation and maintenance of the existing infrastructure. 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.
2	Beaufort West 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.	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. With such a program a source of specific resources of skilled operational personnel, technicians and managers will be established.
3	Beaufort West 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.	Beaufort West 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 Beaufort West 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.

It is important for Beaufort West Municipality to develop a schedule of all policies and bylaws, which needs to indicate an annual rotation plan for the reviewing of all policies and by-laws. This process will assist the Municipality to be developmental and innovative in doing business.

Mechanisms are in place to effectively monitor the compliance of consumers with regard to the Water Supply, Sanitation Services and Industrial Effluent By-laws

Beaufort West 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). Water Services Audit Reports were completed annually for the last number of financial years and were approved by Council as part of the Annual Report.

Beaufort West Municipality needs to focus strongly on the rehabilitation and the maintenance of the existing infrastructure; augmentation of their existing water sources and all planning for new services should be guided

by the Water and Sewer Master Plans. Water and sanitation services are currently effectively managed by Beaufort West Municipality.

Beaufort West 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.

All critical vacant water and sanitation positions as indicated on the approved Organogram needs to be filled as soon as possible. Beaufort West Municipality needs to review the skills needed at each of their 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.

The training of Beaufort West Municipality's personnel involved in the management of water and sanitation services is the most important factor that determines the ability of Beaufort West 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.

Beaufort West 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. Beaufort West 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 Beaufort West 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.

Business Element 12: Social and Customer Service Requirements

Table C.36: Business Element 12: Social and Customer Service Requirements (Topic 12)					
Overview of Topic	**Status Quo and Knowledge Interpretation Statistics**				
This topic provides an overview of the quality of the water services provision function when considered from a customer perspective including the summary of the WSA's responsiveness to customer complaints and queries.	**Item**	**Quality (%)** assessment of current status against compliancy requirements	**Quantity (%)** an indication of the representation of the total area to address the issue	**Future Plan Assessment**	**Strategy Assessment**
	Resources available to perform this function	Scores will be finalised once the new eWSDP website is fully populated.			
	Attending to complaints for water				
	Attending to complaints for Sanitation: Discharge to treatment works				
	Attending to complaints for Sanitation: Pit/ tank pumping				
	TOTAL for Topic				

Problem Definition Statements		
Nr	**Statements - Short Comings**	**Possible Improvement / Project**
1	Beaufort West Municipality needs to continue to record and monitor on a monthly basis all critical water and sanitation stats (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.

Beaufort West Municipality is committed to maintain the existing high levels of customer service in their urban areas and to record all the necessary information for the WSDP on an annual basis. The present Customer Services and Complaints System adequately allow for the recording and management of all water and sanitation related complaints. The Municipality is committed to ensure that all water and sanitation related complaints are recorded and that the complaints are addressed within the time period stipulated in the Client Services Charter.

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. Beaufort West Municipality is therefore committed to ensure that their water quality always complies with national safety standards.

The Water Safety Plan of Beaufort West 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 Beaufort West Municipality against contamination and deteriorating water quality include the following:

- Participate in catchment management and water source protection issues.
- Groundwater Monitoring Programme to ensure the sustainable management of all groundwater resources.
- Correct operation and maintenance of the WTWs.
- Protection and maintenance of the distribution system. This includes ensuring an adequate disinfectant residual at all times, rapid response to pipe bursts and other leaks, regular cleaning of reservoirs, keeping all delivery points tidy and clean, etc.

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

- A well informed Council and municipal managers that understand the extreme importance of and are committed to providing adequate resources for continuous professional operation and maintenance of the water supply system.
- Competent managers and supervisors in the technical department who are responsible for water supply services lead by example and are passionate about monitoring and safeguarding drinking water quality.
- Well informed community members and other consumers of water supply services that know how to protect the water from becoming contaminated once it has been delivered, that have respect for water as a precious resource and that adhere to safe hygiene and sanitation practices.

SECTION D: WATER SERVICES OBJECTIVES AND STRATEGIES

The water services objectives and strategies presented below were derived from the water services situational analysis as summarised in Section C “Water Services Existing Needs Perspective” and presents the 5-year Water Services Objectives and Strategies as established in the WSA’s WSDP.

The water services objectives and strategies presented below are however a summary of the KPIs developed from the water services situational analysis as summarised under Section C “Water Services Existing Needs Perspective” and as taken from the Municipality’s approved SDBIP and presents the 5-year Water Services Objectives and Strategies as established in the WSA’s WSDP.

Table D.1: WSDP FY2016/17: Water Services Objectives and Strategies

Nr	Objective / Strategy	Key Performance Indicator	Baseline (FY2014/15 status quo)	WSDP Year 1 FY2015/16 Target	WSDP Year 2 FY2016/17 Target	WSDP Year 3 FY2017/18 Target	WSDP Year 4 FY2018/19 Target	WSDP Year 5 FY2019/20 Target
WSDP Topic 1: Administration								
	Ensure integrated development and implementation of water services plans							
1.1 (New)	Compile Annual WSDP performance- and Water services Audit Report	▪ Compile Annual WSDP Performance- and Water Services Audit Report ▪ Take Annual WSDP Performance- and Water Services Audit Report to Council for approval	▪ Compile Annual WSDP Performance- and Water Services Audit Report ▪ Take Annual WSDP Performance- and Water Services Audit Report to Council for approval	▪ Compile Annual WSDP Performance- and Water Services Audit Report ▪ Take Annual WSDP Performance- and Water Services Audit Report to Council for approval	▪ Compile Annual WSDP Performance- and Water Services Audit Report ▪ Take Annual WSDP Performance- and Water Services Audit Report to Council for approval	▪ Compile Annual WSDP Performance- and Water Services Audit Report ▪ Take Annual WSDP Performance- and Water Services Audit Report to Council for approval	▪ Compile Annual WSDP Performance- and Water Services Audit Report ▪ Take Annual WSDP Performance- and Water Services Audit Report to Council for approval	▪ Compile Annual WSDP Performance- and Water Services Audit Report ▪ Take Annual WSDP Performance- and Water Services Audit Report to Council for approval
1.2 (New)	Ellicit ownership of the WSDP	▪ Compile an updated WSDP (eWSDP)	▪ Compile 2016/2017 updated WSDP. ▪ Advertise for public comment. ▪ Take WSDP to Council for approval (WSDP-IDP Water Sector Input Report)	-	▪ Update the eWSDP as necessary ▪ Update the WSDP-IDP Water Sector Input Report and take it to Council with the updated IDP.	▪ Update the eWSDP as necessary ▪ Update the WSDP-IDP Water Sector Input Report and take it to Council with the updated IDP.	▪ Update the eWSDP as necessary ▪ Update the WSDP-IDP Water Sector Input Report and take it to Council with the updated IDP.	▪ Update the eWSDP as necessary ▪ Update the WSDP-IDP Water Sector Input Report and take it to Council with the updated IDP.
WSDP Topic 2: Demographics								
2.1 (New)	Sustainable Integrated Human Settlements	Implement SDF priority action plans for each of the towns and ensure new developments are in line with these priority action plans.	Targets to be set by other Department					
WSDP Topic 3: Service levels								
TL38	Number of formal residential properties that receive piped water	Number of residential properties which are billed for water or have prepaid meters.	11938	13069	13069	13069	13069	13069
TL40	Number of formal residential properties connected to the municipal sewerage network for sanitation services.	Number of residential properties which are billed for sewerage.	11542	13402	13402	13402	13402	13402
TL43	Provide free basic water to indigent households in terms of the approved indigent policy.	Number of households receiving free basic water.	5682	6139	6139	6139	6139	6139
TL44	Provide free basic sanitation to indigent households in terms of the approved indigent policy.	Number of households receiving free basic sanitation.	2661	4327	4327	4327	4327	4327
3.1 (New)	Ensure all households on farms are provided with at least basic water services	Support all applications received for basic water services on farms (Subject to availability of financial resources and sustainability of type of service)	-	-	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)
3.2 (New)	Ensure all households on farms are provided with at least basic sanitation services	Support all applications received for basic sanitation services on farms (Subject to availability of financial resources and sustainability of type of service)	-	-	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)	100% of applications received are supported (Subject to availability of funding and sustainability of type of service)

Nr	Objective / Strategy	Key Performance Indicator	Baseline (FY2014/15 status quo)	WSDP Year 1 FY2015/16 Target	WSDP Year 2 FY2016/17 Target	WSDP Year 3 FY2017/18 Target	WSDP Year 4 FY2018/19 Target	WSDP Year 5 FY2019/20 Target
WSDP Topic 4: Socio economic								
TL11	Create temporary job opportunities in terms of EPWP projects	Number of temporary jobs opportunities created.	500	500	500	500	500	500
4.1 (New)	Reduce poverty and unemployment in the area	Alleviation of poverty and unemployment by means of Policies and Programmes	-	-	Alleviate poverty and unemployment by means of: Indigent Support, Local Labour Promotion Projects, LED projects and Supply Chain Management Policy as an instrument to enforce the max. use of local labour.	Alleviate poverty and unemployment by means of: Indigent Support, Local Labour Promotion Projects, LED projects and Supply Chain Management Policy as an instrument to enforce the max. use of local labour.	Alleviate poverty and unemployment by means of: Indigent Support, Local Labour Promotion Projects, LED projects and Supply Chain Management Policy as an instrument to enforce the max. use of local labour.	Alleviate poverty and unemployment by means of: Indigent Support, Local Labour Promotion Projects, LED projects and Supply Chain Management Policy as an instrument to enforce the max. use of local labour.
WSDP Topic 5: Water Services Infrastructure								
TL 26	Approved project budget spent to install the sewerage pipeline and pump station in Buitekant Street Beaufort West by end June	% of Budget spent	95%	100%	-	-	-	-
TL 27	95% of the approved project budget spent to upgrade the water supply to Murraysburg by end June	% of Budget spent	95%	95%	-	-	-	-
TL 32	95% of the approved project budget spent to construct the new bulk water supply to Nelspoort by end June	% of Budget spent	95%	95%	-	-	-	-
	Complete Phase 1 of the Nelspoort WWTW by 30 June 2016	Project completed by 30 June 2016	-	1	-	-	-	-
	Install water pressure reducing valves for central Beaufort West by 30 June 2016	Project completed by 30 June 2016	-	1	-	-	-	-
5.1 (New)	Implement recommendations from detail WTW Technical Process Audits.	% Of recommendations, as included in the WTW Process Audits, implemented.	-	-	45% of recommendations implemented.	60% of recommendations implemented.	75% of recommendations implemented.	90% of recommendations implemented.
5.2 (New)	Implement recommendations from detail WWTW Technical Process Audits.	% Of recommendations, as included in the WWTW Process Audits, implemented.	-	-	45% of recommendations implemented.	60% of recommendations implemented.	75% of recommendations implemented.	90% of recommendations implemented.
5.3 (New)	Implement recommendations included in the Improvement / Upgrade Plan of the Water Safety Plan	% Of recommendations, as included in the Improvement / Upgrade plan of the Water Safety Plan, implemented.	-	-	45% of recommendations implemented.	60% of recommendations implemented.	75% of recommendations implemented.	90% of recommendations implemented.
5.4 (New)	Implement recommendations included in the Improvement / Upgrade Plan of the W_2RAP	% Of recommendations, as included in the Improvement / Upgrade Plan of the W_2RAP, implemented.	-	-	45% of recommendations implemented.	60% of recommendations implemented.	75% of recommendations implemented.	90% of recommendations implemented.
5.5 (New)	Ensure adequate storage capacity	Ensure adequate storage capacity for all towns (At least 48hrs AADD)	-	-	All towns with storage capacity above 48 hrs AADD	All towns with storage capacity above 48 hrs AADD	All towns with storage capacity above 48 hrs AADD	All towns with storage capacity above 48 hrs AADD
5.6 (New)	Implement projects included in the Water Master Plan	Ensure adequate water pump station and water reticulation capacity.	-	-	Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.	Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.	Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.	Upgrade existing water pump stations and provide new pump stations as identified in the Water Master Plan. Upgrade water reticulation networks as proposed in the Water Master Plan.
5.7 (New)	Implement projects included in the Sewer Master Plan	Ensure adequate sewer pump station and drainage network capacity.	-	-	Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.	Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.	Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.	Upgrade existing sewer pump stations and provide new pump stations as identified in the Sewer Master Plan. Upgrade sewer drainage networks as proposed in the Sewer Master Plan.

Nr	Objective / Strategy	Key Performance Indicator	Baseline (FY2014/15 status quo)	WSDP Year 1	WSDP Year 2	WSDP Year 3	WSDP Year 4	WSDP Year 5
				FY2015/16	FY2016/17	FY2017/18	FY2018/19	FY2019/20
				Target	Target	Target	Target	Target
5.8 (New)	Proper Water and Sewer Master Planning	Ensure the Water and Sewer Master Plans are updated regularly.	-	-	Update Water and Sewer Master Plans.	-	-	Update Water and Sewer Master Plans.
5.9 (New)	Ensure adequate budget for the replacement of old water and sewerage infrastructure.	Ensure a budget of at least 2% of the total value of the water and sewerage assets is allocated towards the replacement of existing infrastructure per annum.	-	-	A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.	A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.	A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.	A budget of 2% or more of the value of the water and sewerage assets is allocated towards the replacement of existing infrastructure.
5.10 (New)	Ensure adequate budget for the O&M of the existing water and sewerage infrastructure.	Ensure a budget of at least 1% of the total value of the water and sewerage assets is allocated towards the annual O&M of the systems.	-	-	A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.	A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.	A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.	A budget of 1% or more of the value of the water and sewerage assets is allocated towards the O&M of the systems.
5.11 (New)	Up to date Asset Register	Ensure all water and sewerage infrastructure assets are included in the Asset Register, with accurate CRC, DRC, RUL and conditions of assets.	-	-	Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and condition in the Asset Register are not correct.	Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and condition in the Asset Register are not correct.	Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and condition in the Asset Register are not correct.	Annual reporting to the Financial Department on water and sewerage assets not yet included in the Asset Register and assets for which the CRC, DRC, RUL and condition in the Asset Register are not correct.
WSDP Topic 6: Operation and Maintenance								
TL14	Maintain water quality as per SANS:241 physical and micro parameters	% water quality level	95% Compliance	95% Compliance	95% Compliance	95% Compliance	95% Compliance	95% Compliance
TL15	Maintain quality of final waste water outflow	% final waste water quality level	90% Compliance	90% Compliance	90% Compliance	90% Compliance	90% Compliance	90% Compliance
6.1 (New)	Proper water quality management	Achieve Blue Drop Status	-	-	Overall Blue Drop Score above 90%	Blue Drop Risk Rating of less than 20%	Overall Blue Drop Score above 90%	Blue Drop Risk Rating of less than 20%
6.2 (New)	Proper wastewater quality management	Achieve Green Drop Status	-	-	Green Drop Risk Rating of less than 40% for all plants	Overall Green Drop Score above 85%	Green Drop Risk Rating of less than 40% for all plants	Overall Green Drop Score above 90%
6.3 (New)	Proper water quality monitoring	Ensure that the Municipality's Water Quality Sampling Programmes comply with the minimum SANS241:2011 monitoring frequency for process indicators.	-	-	100% Compliance	100% Compliance	100% Compliance	100% Compliance
6.4 (New)	Reporting on water quality and wstewater quality compliance percentages.	Report at least annually on the percentage of water quality and wastewater quality compliance.	-	-	At least annual publication of water quality and wastewater quality compliance percentages.	At least annual publication of water quality and wastewater quality compliance percentages.	At least annual publication of water quality and wastewater quality compliance percentages.	At least annual publication of water quality and wastewater quality compliance percentages.
6.5 (New)	Ensure proper process control at the WTWs.	Ensure proper process control at all the WTWs. Ensure all forms (checks) as included in the O&M Manuals of the WTWs are implemented by the Process Controllers	-	-	60% Compliance	70% Compliance	80% Compliance	90% Compliance
6.6 (New)	Ensure proper process control at the WWTWs.	Ensure proper process control at all the WWTWs. Ensure all forms (checks) as included in the O&M Manuals of the WWTWs are implemented by the Process	-	-	60% Compliance	70% Compliance	80% Compliance	90% Compliance
WSDP Topic 7: Associated services								
-	-	-	-	-	-	-	-	-

Nr	Objective / Strategy	Key Performance Indicator	Baseline (FY2014/15 status quo)	WSDP Year 1	WSDP Year 2	WSDP Year 3	WSDP Year 4	WSDP Year 5
				FY2015/16	FY2016/17	FY2017/18	FY2018/19	FY2019/20
				Target	Target	Target	Target	Target
WSDP Topic 8.1: Conservation and Demand management - Water Resource Management								
TL13	Limit unaccounted water to less than 15% between source and sector meters	% of water unaccounted for between source and sector meters	15%	15%	15%	15%	15%	15%
TL20	95% of the approved project budget spent to implement WC/WDM Plan with the replacement of water meters.	% of Budget spent	95%	-	-	-	-	-
8.1.1 (New)	Implement Long Term WC/WDM Strategy	Implement projects as included in the newly developed WC/WDM Strategy	-	-	At least 10% of the recommended WC/WDM projects implemented.	At least 15% of the recommended WC/WDM projects implemented.	At least 20% of the recommended WC/WDM projects implemented.	At least 25% of the recommended WC/WDM projects implemented.
WSDP Topic 8.2 & 8.3: Conservation and Demand management - Water Balance								
8.3.1 (New)	Metering of all water usage	Ensure all bulk water is metered at source, at WTW (incoming and outgoing) and at all bulk storage reservoirs.	-	-	80% Compliance	85% Compliance	90% Compliance	100% Compliance
8.3.2 (New)	Metering of all wastewater	Ensure all incoming flow and outgoing flow at WWTWs are metered, as well as final effluent re-used for irrigation purposes.	-	-	80% Compliance	85% Compliance	90% Compliance	100% Compliance
WSDP Topic 9: Water Resources								
9.1 (New)	All water sources are authorised	% of Abstraction from sources registered and authorised by the DWS.	-	-	85% Compliance	90% Compliance	95% Compliance	100% Compliance
9.2 (New)	Ensure adequate yield and allocations from water resources to meet the projected future water requirements.	Ensure adequate yield and allocations to meet the projected five year water requirements for all four towns.	-	-	100% Adequate supply to meet water requirements for all four towns.	100% Adequate supply to meet water requirements for all four towns.	100% Adequate supply to meet water requirements for all four towns.	100% Adequate supply to meet water requirements for all four towns.
9.3 (New)	Continue with the implementation of the Groundwater Monitoring / Management Programme.	Ensure groundwater monitoring / management programme for boreholes are implemented and raw water quality is monitored at least annually.	-	-	Implement Groundwater Management Programme and monitor raw water quality at least annually.	Implement Groundwater Management Programme and monitor raw water quality at least annually.	Implement Groundwater Management Programme and monitor raw water quality at least annually.	Implement Groundwater Management Programme and monitor raw water quality at least annually.
9.4 (New)	Monitor effluent quality and quantity at the three abattoirs in Beaufort West.	% Monitoring of effluent discharged by abattoirs (Quantity and Quality)	-	-	Monitor effluent at one of the three abattoirs	Monitor effluent at two of the three abattoirs	Monitor effluent at all three abattoirs	Monitor effluent at all three abattoirs
WSDP Topic 10: Financial profile								
TL17	90% of the sanitation assets maintenance budget spent	% of Budget spent	90%	90%	90%	90%	90%	90%
TL19	90% of the water assets maintenance budget spent	% of Budget spent	90%	90%	90%	90%	90%	90%
TL34	Financial viability measured in terms of the municipality's ability to meet it's service debt obligations.	Ratio achieved	2	2	2	2	2	2
TL35	Financial viability measured in terms of the outstanding service debtors.	% Achieved.	32%	32%	32%	32%	32%	32%
TL36	Financial viability measured in terms of the available cash to cover fixed operating expenditure.	Ratio achieved	0.2	0.2	0.2	0.2	0.2	0.2

Nr	Objective / Strategy	Key Performance Indicator	Baseline (FY2014/15 status quo)	WSDP Year 1	WSDP Year 2	WSDP Year 3	WSDP Year 4	WSDP Year 5
				FY2015/16	FY2016/17	FY2017/18	FY2018/19	FY2019/20
				Target	Target	Target	Target	Target
TL37	Achieve an annual average payment percentage of not less than 85%.	Payment % achieved.	85%	85%	85%	85%	85%	85%
10.1 (New)	Review tariffs charge for sewerage services.	Investigate the possibility of linking the sewerage tariffs to the volume of water use. Volumetric usage, whereby charges are determined according to water usage with maximum ceilings and charged accordingly.	Targets to be set by other Department					
WSDP Topic 11: Institutional Arrangements profile								
TL46	0.1% of the Municipality's operational budget spent on implementing its workplace skills plan.	(Actual amount spent on training / total operational budget) x 100	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
	Develop a Policy on the appointment of temporary staff and submit to Council by 30 June 2016.	Policy on the appointment of temporary staff developed and submitted to Council by 30 June 2016.	-	1	-	-	-	-
11.1 (New)	Ensure adequate Process Controllers at the WTWs	% Compliance w.r.t the number of existing Process Controllers at the WTWs and the required number of Process Controllers.	-	-	50 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	60 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	70 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	80 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.
11.2 (New)	Ensure adequate Process Controllers at the WWTWs	% Compliance w.r.t the number of existing Process Controllers at the WWTWs and the required number of Process Controllers.	-	-	50 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	60 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	70 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.	80 % Of plants meeting the requirements, w.r.t. the number of Process Controllers per shift.
WSDP Topic 12: Social and Customer service requirements								
-	-	-	-	-	-	-	-	-

SECTION E: WATER SERVICES MTEF PROJECTS

The Water Services Medium-Term Expenditure Framework (MTEF) projects are presented below and outline the water services projects which are funded for implementation within the next three years. Table E.2a provides the projects identified for implementation in FY2015/16, Table E.2b provides the projects identified for implementation in FY 2016/17 and Table E.2c provides the projects identified for implementation in FY2017/18. The table below gives an overview of the water services projects, as included in the MTEF.

The draft 2016/2017 three year Capital Budget of Beaufort West Municipality was not yet available when this report was compiled.

Table E.1: Summary of MTEF Projects

Project Main Category	FY2016/17		FY2017/18		FY2018/19		MTEF Total	
	Nr	Value (R'000)	Nr	Value (R'000)	Nr	Value (R'000)	**Nr**	**Value (R'000)**
Water Projects	1	R100	2	R1,275	2	R1,052	**4**	**R2,427**
Sewerage Projects	2	R6,658	1	R415	4	R8,893	**6**	**R15,967**
Combined Water & Sewerage Projects	**3**	**R6,758**	**3**	**R1,690**	**6**	**R9,945**	**10**	**R18,394**

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Table E.2a: Water Services MTEF Projects - FY2016/17 (1st year MTEF period)

`	Project Reference Number	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources										MTEF Project Source
								Prev spent FY2015/16	FY2016/17 Budget	Own	MIG	RBIG	ACIP	DR	MWIG	Other	Total Cost	
1. Infrastructure Projects								**R0**	**R6,758**								**R6,758**	
1.1	MIG 212729	New Total Pressure Reduction of Water Network	Implement last phase of pressure reduction in Beaufort	Pressure Reduction (WC/WDM Strategy)	Water	Internal	Reticulation		**R100**		R100						**R100**	WC/WDM Strategy
1.2	MIG 211853 & 1145	Rehabilitate Sanitation: Oxidation Ponds Murraysburg	Upgrade Murraysburg oxidation ponds	Ensure adequate treatment capacity and compliance with effluent quality	Sanitation	Bulk	WWTW		**R6,658**	R423	R6,235						**R6,658**	WWTW Process Audits
2. Source Development Projects								**R0**	**R0**								**R0**	
																	R0	
3. Demand Management projects								**R0**	**R0**								**R0**	
																	R0	
4. O&M Commitments								**R0**	**R0**								**R0**	
Operations																	**R0**	
																	R0	
Maintenance																	**R0**	
																	R0	
5. Institutional								**R0**	**R0**								**R0**	
																	R0	
6. Water Services Programmes								**R0**	**R0**								**R0**	
Awareness Programs																	**R0**	
																	R0	
WASH Programs																	**R0**	
																	R0	
		Total						**R0**	**R6,758**								**R6,758**	

Table E.2b: Water Services MTEF Projects - FY2017/18 (2nd year MTEF period)

Nr	Project Reference Number	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources									MTEF Project Source
								Prev spent FY2015/16	FY2017/18 Budget	Own	MIG	RBIG	ACIP	DR	MWIG	Other	Total Cost	
1. Infrastructure Projects								**R0**	**R497**								**R497**	
1.1	MIG 209615	Upgrade & Extend Water Supply Murraysburg	Upgrade bulk water supply	Ensure adequate bulk infrastructure capacity	Water	Bulk	Bulk Pipelines		**R82**		R82						**R82**	WSDP and Master Plans
1.2	MIG 211853	Rehabilitate Sanitation: Oxidation Ponds Murraysburg	Upgrade Murraysburg oxidation ponds	Ensure adequate treatment capacity and compliance with effluent quality standards	Sanitation	Bulk	WWTW		**R415**		R415						**R415**	WWTW Process Audits
																	R0	
2. Source Development Projects								**R0**	**R1,193**								**R1,193**	
2.1	MIG 195857	Investigation for New Aquifers	Further groundwater development for Beaufort West	Ensure adequate yield from existing sources to meet future water requirements	Water	Bulk	Sources		**R1,193**		R1,193						**R1,193**	WSDP
3. Demand Management projects								**R0**	**R0**								**R0**	
																	R0	
4. O&M Commitments								**R0**	**R0**								**R0**	
Operations																	**R0**	
																	R0	
Maintenance																	**R0**	
																	R0	
5. Institutional								**R0**	**R0**								**R0**	
																	R0	
6. Water Services Programmes								**R0**	**R0**								**R0**	
Awareness Programs																	**R0**	
																	R0	
WASH Programs																	**R0**	
																	R0	
		Total						**R0**	**R1,690**								**R1,690**	

Table E.2c: Water Services MTEF Projects - FY2018/19 (3rd year MTEF period)

Nr	Project Reference Number	Project Name	Description	Project Driver	Main Category "W" or "S"	Sub Category	Component type	Project Budget / Funding Sources									MTEF Project Source
								Prev spent FY2015/16	FY2018/19 Budget	Own	MIG	RBIG	ACIP	DR	MWIG	Other	Total Cost	
1. Infrastructure Projects								**R0**	**R8,893**								**R8,893**	
1.1	MIG 217821	External Sewerage Pipeline - Rustdene Buitekant Street (Ph4 Housing) Budget Maintenance	Install new bulk sewer pipeline	Bulk Infrastructure for housing delivery	Sanitation	Bulk	Bulk sewer pipeline		**R36**		**R36**						**R36**	Sewer Master Plan
1.2	MIG 228454	New External Sewerage Pipeline Ph2	Install new bulk sewer pipeline	Bulk Infrastructure for housing delivery	Sanitation	Bulk	Bulk sewer pipeline		**R6,164**		**R6,164**						**R6,164**	Sewer Master Plan
1.3	MIG 211513	Rehabilitate Sanitation: Oxidation Ponds: Nelspoort	Upgrade Nelspoort oxidation ponds	Ensure adequate treatment capacity and compliance with effluent quality	Sanitation	Bulk	WWTW		**R2,135**		**R2,135**						**R2,135**	WWTW Process Audits
1.4	MIG 229827	Rehabilitate Sanitation: Oxidation Ponds: Nelspoort Ph2	Upgrade Nelspoort oxidation ponds	Ensure adequate treatment capacity and compliance with effluent quality	Sanitation	Bulk	WWTW		**R558**		**R558**						**R558**	WWTW Process Audits
2. Source Development Projects								**R0**	**R1,052**								**R1,052**	
2.1	MIG 195518	New Bulk Water Supply: Nelspoort	Bulk water pipeline to connect new borehole to existing system and upgrade of WTW	Ensure security of supply from groundwater resources	Water	Bulk	Bulk water pipeline and WTW		**R700**		**R700**						**R700**	WSDP and Water Master Plan
2.2	MIG 195857	Investigation for New Aquifers: Beaufort West	Further groundwater development for Beaufort West	Ensure adequate yield from existing sources to meet future water requirements	Water	Bulk	Sources		**R352**		**R352**						**R352**	WSDP
3. Demand Management projects								**R0**	**R0**								**R0**	
3.1																	**R0**	
4. O&M Commitments								**R0**	**R0**								**R0**	
Operations																	**R0**	
4.1																	**R0**	
Maintenance																	**R0**	
																	R0	
5. Institutional								**R0**	**R0**								**R0**	
																	R0	
6. Water Services Programmes								**R0**	**R0**								**R0**	
Awareness Programs																	**R0**	
																	R0	
WASH Programs																	**R0**	
																	R0	
		Total						**R0**	**R9,945**								**R9,945**	

SECTION F: WSDP PROJECTS

The identification of projects necessary to ensure the provision of adequate levels of water and sanitation services is based primarily on the findings of the Water and Sewer Master Plans, in consultation with the Municipality's town planning consultants. Master Planning is typically based on a forward planning horizon of 20 years, but is usually updated every three to five years, taking into account improved water demand estimates and subsequent infrastructure developments which may have taken place. Water and Sewer Master Plans were drafted for Beaufort West Municipality by during November 2008. The recommended projects from these Master Plans were incorporated into the WSDP.

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

- Water and Sewer Master Plans for the internal water reticulation and sewer drainage networks and Water and Waste Water Treatment Works Master Plans and Process Audits.
- Infrastructure replacement needs (Asset Register)
- Budget proposals
- Asset Management Plans

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

- Augmentation of Beaufort West groundwater resources.
- Upgrading of the Murraysburg oxidation ponds.

The new NWRS 2 list the following steps to raise the water profile in development planning:

- Water must be placed at the centre of integrated planning and decision-making, with a specific aim to respond to and support the achievement of national development and sector goals.
- Current budgets need to adequately provide for water, which might mean they have to be doubled to cater for the present needs.
- Current financial values need to appreciate water as a scarce resource and should thus reflect the real value of water. This requires a new value system across all sectors and stakeholders.
- Water efficiency and curbing water losses should be high on the agenda of each individual and institution in the country.
- Water management must be formally embedded in the sector businesses with associated accountability.

The DWS will insist in the future that all water infrastructure which they fund is value engineered against the life-cycle cost with a specific emphasis on energy costs. Evidence will be required that the technical design is appropriate for the nature of the resource and that operation and maintenance of the assets is reasonably within the capability of the responsible institution. New water resources infrastructure will also not be developed or authorized unless effective WC/WDM interventions have been put in place in the affected area.

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

- Take the recommended projects, as identified through the Water and Sewer Master Plans and the WSDP, into account during the planning and prioritization process for new infrastructure. Prioritize from the desired list, those items which can be implemented from available funding in the particular financial year.

- Undertake revised master planning at least every three to five years and to use the Master Plans to list the desired infrastructure development requirements and reflect these in the IDP.

- Assign a high priority to the implementation of the approved WC/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. The costs of physical water loss, the capital requirements for new water resources infrastructure, and the constraints of poor water availability on water dependent economic growth means that WC/WDM is a critical management priority for stretching the financial resources of the Municipality. WC/WDM is almost always a more cost-effective solution than the implementation of new infrastructure, and no new infrastructure should be developed until unauthorized water has been reduced to manageable volumes.

- To adopt appropriate technology solutions for the water and sewerage infrastructure challenges. Techniques such as value engineering should also be adopted to ensure that investments in infrastructure and other solutions are cost effective over the full life-cycle and designed to be fit for purpose.

- To ensure adequate funding for the full lifecycle cost of the new water and sewerage infrastructure, which will include funds for the operation and maintenance of the infrastructure and regular refurbishment.

- 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.

The current needs projects are estimated at R29.542 million of which 62.26% are funded, as included in the draft 2016/2017 MTEF project list. It should however be emphasised that additional funding will be required to address the full achievement of the water services strategies as outlined in Sections C and D, but that the extent of such additional funding can only be determined, once initial investigations and activities have been concluded.

Table F.1: WSDP FY2016/17: LIST OF CONCEPTUAL PROJECTS										
Nr	Situation Assessment (Problem Definition)	Solution description as defined by topic situation assessment (Strategy)	Conceptual project	Is there an existing project addressing this problem?	Existing Projects Information			Does this current listed project address the problem totally?	Approved by Council, in project database and part of 5 year IDP cycle projects?	Project listed in 3yr MTEF - cycle?
					Project Number	Project Title	Project Cost R'000			
CURRENT NEEDS										
Water Services Development Planning										
1.1	WSDP Performance and Water Services Audit Report needs to be drafted annually	Compile annual WSDP Performance and Water Services Audit Report	WSDP	Yes	O&M	Compile annual WSDP Performance and Water Services Audit Report	R175	Yes	Yes	Yes
1.2	Regular updating of WSDP	Update WSDP every two to three years	WSDP	Yes	O&M	Regular updating of WSDP	R250	Yes	Yes	Yes
1.3	The existing Water and Sewer Master Plans need to be updated.	Ensure up to date Water and Sewer Master Plans	WSDP	No	WSDP	Upgrade existing Water and Sewer Master Plans	R600	No	No	No
Business Element 2: Demographics (Topic 2)										
	Done by other Department									
Business Element 3: Service Levels (Topic 3)										
3.1	Some households on the farms without basic water services.	Ensure all households on farms are provided with at least basic water services, subject to DWS guidance.	WSDP	No	WSDP	Provide basic water services on the farms in the rural areas without basic water services.	R504	Yes	No	No
3.2	Some households on the farms without basic sanitation services.	Ensure all households on farms are provided with at least basic sanitation services, subject to DWS guidance.	WSDP	No	WSDP	Provide basic sanitation services on the farms in the rural areas without basic sanitation services.	R4,160	Yes	No	No
Business Element 4: Socio-Economic Background (Topic 4)										
	Done by other Department									
Business Element 5: Water Services Infrastructure Management (Topic 5)										
5.1	Capacity of existing bulk sewer pipeline is inadequate	Bulk Infrastructure for housing delivery	MTEF Project	Yes	MIG 217821	Rehabilitate Sanitation: Oxidation Ponds: Nelspoort	R36	Yes	Yes	Yes
5.2	Existing oxidation ponds need to be rehabilitated	Ensure adequate treatment capacity and compliance with effluent quality standards	MTEF Project	Yes	MIG 211513	Rehabilitate Sanitation: Oxidation Ponds: Nelspoort	R2,135	Yes	Yes	Yes
5.3	Existing oxidation ponds need to be rehabilitated	Ensure adequate treatment capacity and compliance with effluent quality standards	MTEF Project	Yes	MIG 229827	Rehabilitate Sanitation: Oxidation Ponds: Nelspoort Ph2	R558	Yes	Yes	Yes
5.4	Existing oxidation ponds need to be rehabilitated	Ensure adequate treatment capacity and compliance with effluent quality standards	MTEF Project	Yes	MIG 211853 & 1145	Rehabilitate Sanitation: Oxidation Ponds: Murraysburg	R7,073	Yes	Yes	Yes
5.5	Capacity of existing bulk water infrastructure is inadequate to meet future requirements	Ensure adequate bulk infrastructure capacity	MTEF Project	Yes	MIG 209615	Upgrade & Extend Water Supply: Murraysburg	R82	Yes	Yes	Yes
5.6	Capacity of existing bulk sewer pipeline is inadequate	Bulk Infrastructure for housing delivery	MIG list	Yes	MIG 228454	New External Sewerage Pipeline Ph2 - Rustdene Buitekant Street (Ph4 Housing)	R6,164	Yes	Yes	Yes
Business Element 6: Operation and Maintenance (Topic 6)										
6.1	WTW Process Audits need to be done annually	Sustainable operation	WSDP	Yes	O&M	Annual WTW Process Audits	R120	Yes	Yes	Yes
6.2	WWTW Process Audits need to be done annually	Sustainable operation	WSDP	Yes	O&M	Annual WWTW Process Audits	R120	Yes	Yes	Yes
Business Element 7: Associated Services (Topic 7)										
Business Element 8: Conservation and Demand Management - Water Resource (Topic 8.1, 8.2 and 8.3)										
8.1	The existing NRW and Water Losses are very high	Implement last phase of pressure reduction in Beaufort West to reduce NRW and Water Losses	MTEF Project	Yes	MIG 212729	New Total Pressure Reduction of Water Network: Beaufort West	R100	Yes	Yes	Yes
8.2	The existing NRW and Water Losses are very high	Implement WC/WDM Strategy	WSDP	Partly		Implement WC/WDM measures as identified in the WC/WDM Strategy	R5,140	No	No	No

Table F.1: WSDP FY2016/17: LIST OF CONCEPTUAL PROJECTS

Nr	Situation Assessment (Problem Definition)	Solution description as defined by topic situation assessment (Strategy)	Conceptual project	Is there an existing project addressing this problem?	Existing Projects Information			Does this current listed project address the problem totally?	Approved by Council, in project database and part of 5 year IDP cycle projects?	Project listed in 3yr MTEF - cycle?
					Project Number	Project Title	Project Cost R'000			
CURRENT NEEDS										
Business Element 9: Water Resources (Topic 9)										
9.1	Capacity of existing resources is inadequate to meet future water requirements	Ensure adequate yield from existing sources to meet future water requirements	MTEF Project	Yes	MIG 195857	Investigation for New Aquifers: Beaufort West	R1,545	No	Yes	Yes
9.2	Capacity of existing resources is inadequate to meet future water requirements	Ensure security of supply from groundwater resources	MTEF Project	Yes	MIG 195518	New Bulk Water Supply: Nelspoort	R700	Yes	Yes	Yes
9.3	Effluent discharged by abattoirs is not yet monitored	Ensure all effluent discharged by abattoirs are monitored (Quality and Quantity)	WSDP	No	O&M	Monthly monitoring of effluent discharged by abattoirs	R80	Yes	No	No
Business Element 10: Financial Profile (Topic 10)										
Business Element 11: Water Services Institutional Arrangements (Topic 11)										
Business Element 12: Social and Customer Service Requirements (Topic 12)										
TOTAL: CURRENT NEEDS							**R29,542**			
	Funded						R18,394			
	% Funded						62.26%			
FUTURE NEEDS										
Infrastructure										
	Sections of the existing water reticulation infrastructure need to be upgraded	Implement items identified in the Water Master Plan	Water Master Plan	No	Various	Implement Water Master Plan items within the various towns	R10,559	Yes	No	No
	Sections of the existing sewerage drainage networks needs to be upgraded	Implement items identified in the Sewer Master Plan	Sewer Master Plan	No	Various	Implement Sewer Master Plan items within the various towns	R12,158	Yes	No	No
	Capacity of existing bulk sewer pipeline is inadequate	Sections of the existing water reticulation infrastructure need to be upgraded	WSDP	No	Ensure adequate reservoir storage capacity to meet future requirements	Reservoir storage capacity is inadequate to meet future requirements	R2,300	Yes	No	No
	Capacity of existing sewer pump station is inadequate to meet future requirements	Ensure adequate sewer pump station capacity	WSDP	No	New 0.5 Ml reservoir for Merweville	Water Master Plan	R302	Yes	No	No
	Concrete at Beaufort West WWTW needs to be rehabilitated	Rehabilitation of existing WWTW	WSDP	No	New 0.5 Ml/d WTW for Nelspoort	Nr	R3,300	Yes	No	No
	Capacity of WWTW needs to be upgraded to meet future requirements.	Ensure adequate treatment capacity and compliance with effluent quality standards	WSDP	No	Geohydrological exploration with geophysics should be completed for Murraysburg	Nr	R12,700	Yes	No	No
	Reservoir storage capacity is inadequate to meet future requirements	Ensure adequate reservoir storage capacity to meet future requirements	WSDP	No	New 0.5 Ml/d WTW for Nelspoort	Various	R8,815	Yes	No	No
	Reservoir storage capacity is inadequate to meet future requirements	Ensure adequate reservoir storage capacity to meet future requirements	WSDP	No	BW1415013	New 0.5 Ml reservoir for Merweville	R2,709	Yes	No	No
	Capacity of existing WTW is inadequate to treat additional groundwater from newly developed borehole	Ensure adequate water treatment capacity and compliance with water quality standards	WSDP	No	BW1415017	New 0.5 Ml/d WTW for Nelspoort	R6,300	Yes	No	No
Resources										
	Geohydrological exploration with geophysics should be completed for Murraysburg	Ensure adequate yield from existing sources to meet future water requirements	WSDP	No		Develop additional groundwater resources for Murraysburg	R1,250	Yes	No	No
	Capacity of existing resources is inadequate to meet future water requirements	Ensure adequate yield from existing sources to meet future water requirements	WSDP	Partly	BW1415001	Develop new groundwater resources for Beaufort West	R60,000	Yes	Partly	Partly
TOTAL: FUTURE NEEDS							**R124,868**			