



WATER SERVICES DEVELOPMENT PLAN - INTERGRATED DEVELOPMENT PLAN SECTOR
INPUT REPORT: FY 2024/25

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Municipality

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WSDP – IDP WATER SECTOR INPUT REPORT

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ABBREVIATIONS AND DEFINITIONS

AADD	Average Annual Daily Demand
ADWF	Average Dry Weather Flow
AIDS	Acquired Immune Deficiency Syndrome
AMP	Asset Management Plan
AMR	Automatic Meter Reading
BGCMA	Breede-Gouritz Catchment Management Area
BGWMA	Breede-Gouritz Water Management Area
BNG	Breaking New Ground
BNR	Biological Nutrient Removal
BOCMA	Breede Overberg Catchment Management Agency
CBR	Central Breede River
CCT	City of Cape Town
CMA	Catchment Management Agency
COD	Chemical Oxygen Demand
CRC	Current Replacement Cost
CRR	Cumulative Risk Ratio
DRC	Depreciated Replacement Cost
DSVI	Diluted Sludge Volume Index
DWQ	Drinking Water Quality
DWS	Department of Water and Sanitation
FDA	Future Development Area
GAMAP	General Accepted Municipal Accounting Practice
GRAP	Generally Recognized Accounting Practice
HIV	Human Immunodeficiency Virus
IAM	Infrastructure Asset Management
IBT	Inclining Block Tariff
IDP	Integrated Development Plan
ILI	Infrastructure Leakage Index
IMQS	Infrastructure Management Query System
IRDP	Integrated Rural Development Program
IRIS	Integrated Regulatory Information System
IWA	International Water Association
km ²	Square Kilometre
KPI	Key Performance Indicator
LGTAS	Local Government Turn Around Strategy
m	Metre
MCC	Motor Control Center
MFMA	Municipal Finance Management Act
MIG	Municipal Infrastructure Grant
MISA	Municipal Infrastructure Support Agent
Ml	Mega Litre
Ml/a	Mega Litre per Annum
MLE	Modified Ludzack-Ettinger
MLSS	Mixed Liquor Suspended Solids
MSCOA	Municipal Standard Chart of Accounts
MTEF	Medium-Term Expenditure Framework
MTREF	Medium Term Revenue Expenditure Framework
NRW	Non-Revenue Water
NWRS	National Water Resource Strategy

ABBREVIATIONS AND DEFINITIONS

PAT	Progress Assessment Tool
PDD	Peak Daily Demand
PPE	Personnel Protective Equipment
PRV	Pressure Reducing Valve
PST	Pump Station
RAS	Return Activated Sludge
RDP	Reconstruction and Development Programme
RUL	Remaining Useful Life
SALGA	South African Local Government Association
SANS	South African National Standard
SAR	Sodium Absorption Ratio
SCADA	Supervisory Control and Data Acquisition
SCM	Supply Chain Management
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SST	Secondary Settling Tanks
SVI	Sludge Volume Index
TMG	Table Mountain Group
TSS	Total Suspended Solids
UISP	Upgrading of Informal Settlements Programme
VAT	Value Added Tax
VIP	Ventilated Improved Pit
WARMS	Water Authorisation Registration and Management System
WDM	Water Demand Management
WMA	Water Management Area
WSA	Water Services Authority
WSDP	Water Services Development Plan
WSIG	Water Services Infrastructure Grant
WSP	Water Services Provider
WTW	Water Treatment Works
WUA	Water User Association
WWTW	Waste Water Treatment Works

KEY TERMS AND INTERPRETATIONS

Climate Change	Changes in climatic conditions due to natural causes or to anthropogenic (man-made) effects such as emissions of greenhouse gases, e.g. carbon dioxide, nitrous oxide, and methane, from industry, transport, farming and deforestation, that are expected to have significant consequences for rainfall and water availability on earth.																							
Current replacement cost (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.																							
Depreciated Replacement Cost (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.																							
Financial Year	Financial year means in relation to- • a national or provincial department, the year ending 31 March; or • a municipality, the year ending 30 June.																							
Global Warming	The increase in the average surface temperatures across the globe, usually measured over long periods of time; reported to have increased by 1°C over the past hundred years.																							
Integrated Development Plan (IDP)	An IDP is a legislative requirement for municipalities, which identifies the municipality's key development priorities; formulates a clear vision, mission, and values; formulates appropriate strategies; shows the appropriate organisational structure and systems to realise the vision and the mission and aligns resources with the development priorities.																							
National Water Resource Strategy 2	Sets out how we will achieve the following core objectives: • Water supports development and the elimination of poverty and inequality. • Water contributes to the economy and job creation, and • Water is protected, used, developed, conserved, managed, and controlled sustainably andequitably.																							
International Water Association (IWA) Water Balance	<table><tr><td rowspan="8">System Input Volume</td><td rowspan="2">Authorised Consumption</td><td>Billed Authorised Consumption</td><td>Billed Metered Consumption</td><td rowspan="2">Revenue Water</td></tr><tr><td></td><td>Billed Unmetered Consumption</td></tr><tr><td rowspan="6">Water Losses</td><td>Unbilled Authorised Consumption</td><td>Unbilled Metered Consumption</td><td rowspan="6">Non-Revenue Water</td></tr><tr><td></td><td>Unbilled Unmetered Consumption</td></tr><tr><td>Commercial Losses</td><td>Unauthorised Consumption</td></tr><tr><td rowspan="3">Physical Losses</td><td>Customer Meter Inaccuracies and Data Handling Erros</td></tr><tr><td>Leakage on Transmission and Distribution Mains</td></tr><tr><td>Leakage and Overflows from the Utilities Storage Tanks</td></tr><tr><td></td><td></td><td>Leakage on Service Connections up to the Customer Meter</td><td></td></tr></table>	System Input Volume	Authorised Consumption	Billed Authorised Consumption	Billed Metered Consumption	Revenue Water		Billed Unmetered Consumption	Water Losses	Unbilled Authorised Consumption	Unbilled Metered Consumption	Non-Revenue Water		Unbilled Unmetered Consumption	Commercial Losses	Unauthorised Consumption	Physical Losses	Customer Meter Inaccuracies and Data Handling Erros	Leakage on Transmission and Distribution Mains	Leakage and Overflows from the Utilities Storage Tanks			Leakage on Service Connections up to the Customer Meter	
System Input Volume	Authorised Consumption			Billed Authorised Consumption	Billed Metered Consumption		Revenue Water																	
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				Leakage on Transmission and Distribution Mains																				
		Leakage and Overflows from the Utilities Storage Tanks																						
		Leakage on Service Connections up to the Customer Meter																						
System Input Volume	The volume of treated water input to that part of the water supply system to which the water balance calculation relates.																							
Authorised Consumption	The volume of metered and/or un-metered water taken by registered customers, the water supplier and others who are implicitly or explicitly authorised to do so by the water supplier, for residential, commercial, and industrial purposes. It also includes water exported across operational boundaries. Authorised consumption may include items such as fire-fighting and training, flushing of mains and sewers, street cleaning, watering of municipal gardens, public fountains, frost protection, building water, etc. These may be billed or unbilled, metered, or unmetered.																							
Water Losses	The difference between System Input and Authorised Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission or distribution schemes, or individual zones. Water Losses consist of Physical Losses and Commercial Losses (also known as Real Losses and Apparent Losses).																							
Billed Authorised Consumption	Those components of Authorised Consumption which are billed and produce revenue (also known as Revenue Water). Equal to Billed Metered Consumption plus Billed Unmetered Consumption.																							
Unbilled Authorised Consumption	Those components of Authorised Consumption which are legitimate but not billed and therefore do not produce revenue. Equal to Unbilled Metered Consumption plus Unbilled Unmetered Consumption.																							
Commercial Losses	Includes all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing), plus unauthorised consumption (theft or illegal use). Commercial losses are called “Apparent Losses” by the International Water Association and in some countries the misleading term “Non-Technical Losses” is used.																							

KEY TERMS AND INTERPRETATIONS

Physical Losses	Physical water losses from the pressurized system and the utility's storage tanks, up to the point of customer use. In metered systems this is the customer meter, in unmetered situations this is the first point of use (stop tap/tap) within the property. Physical losses are called "Real Losses" by the International Water Association and in some countries the misleading term "Technical Losses" is used.
Billed Metered Consumption	All metered consumption which is also billed. This includes all groups of customers such as domestic, commercial, industrial, or institutional and also includes water transferred across operational boundaries (water exported) which is metered and billed.
Billed Unmetered Consumption	All billed consumption which is calculated based on estimates or norms but is not metered. This might be a very small component in fully metered systems (for example billing based on estimates for the period a customer meter is out of order) but can be the key consumption component in systems without universal metering. This component might also include water transferred across operational boundaries (water exported) which is unmetered but billed.
Unbilled Metered Consumption	Metered Consumption which is for any reason unbilled. This might for example include metered consumption by the utility itself or water provided to institutions free of charge, including water transferred across operational boundaries (water exported) which is metered but unbilled.
Unbilled Unmetered Consumption	Any kind of Authorised Consumption which is neither billed nor metered. This component typically includes items such as fire-fighting, flushing of mains and sewers, street cleaning, frost protection, etc. In a well-run utility it is a small component which is very often substantially overestimated. Theoretically this might also include water transferred across operational boundaries (water exported) which is unmetered and unbilled – although this is an unlikely case.
Unauthorised Consumption	Any unauthorised use of water. This may include illegal water withdrawal from hydrants (for example for construction purposes), illegal connections, bypasses to consumption meters or meter tampering.
Customer Metering Inaccuracies and Data Handling Errors	Commercial water losses caused by customer meter inaccuracies and data handling errors in the meter reading and billing system.
Leakage on Transmission and /or Distribution Mains	Water lost from leaks and breaks on transmission and distribution pipelines. These might either be small leaks which are still unreported (e.g., leaking joints) or large bursts which were reported and repaired but did obviously leak for a certain period before that.
Leakage and Overflows at Utility's Storage Tanks	Water lost from leaking storage tank structures or overflows of such tanks caused by e.g., operational, or technical problems.
Leakage on Service Connections up to point of Customer Metering	Water lost from leaks and breaks of service connections from (and including) the tapping point until the point of customer use. In metered systems this is the customer meter, in unmetered situations this is the first point of use (stop tap/tap) within the property. Leakage on service connections might be reported breaks but will predominately be small leaks which do not surface and which run for long periods (often years).
Revenue Water	Those components of Authorised Consumption which are billed and produce revenue (also known as Billed Authorised Consumption). Equal to Billed Metered Consumption plus Billed Unmetered Consumption.
Non-Revenue Water	Those components of System Input which are not billed and do not produce revenue. Equal to Unbilled Authorised Consumption plus Physical and Commercial Water Losses.
Remaining useful life (RUL)	The time remaining over which an asset is expected to be used.
Re-use	Utilisation of treated or untreated wastewater for a process other than the one that generated it. For instance, the re-use of municipal wastewater for agricultural irrigation. Water re-use can be direct or indirect, intentional, or unintentional, planned, or unplanned, local, regional, or national in terms of location, scale, and significance. Water re-use may involve various kinds of treatment (or not) and the reclaimed water may be used for a variety of purposes.
Service Delivery Budget Implementation Plan (SDBIP)	The SDBIP is a management, implementation and monitoring tool that enable the City Manager to monitor the performance of senior managers, the mayor to monitor the performance of the City Manager, and for the community to monitor the performance of the municipality.
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.
Water Conservation	The minimisation of loss or waste, the care and protection of water resources and the efficient and effective use of water.
Water Demand Management	The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water to meet any of the following objectives: economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services, and political acceptability.

KEY TERMS AND INTERPRETATIONS

Water Services Authority (WSA)	A water services authority means a municipality with the executive authority and the right to administer water services as authorised in terms of the Municipal Structures Act, 1998 (Act No.117 of 1998). 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.
Water Services Development Plan (WSDP)	A plan to be developed and adopted by the WSA in terms of the Water Services Act, 1997 (Act No.108 of 1997)
WSDP Guide Framework	Modular tool which has been developed by the DWS to support WSAs in complying to the Water Services Act with respect to Water Services Development Planning and which is also used by the DWS to regulate such compliance.
Water Services Provider (WSP)	A WSP means any person or institution that provides water services to consumers or to another water services institution, but does not include a water services intermediary.

WSDP – IDP Water Sector Input Report (Executive Summary)

Introduction

Every WSA has a duty to progressively ensure efficient, affordable, economical, and sustainable access to water services to all customers or potential customers in its area of jurisdiction, to 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 set of WSDP guidelines to assist WSAs with the WSDP process and to provide a framework for the capturing of the data. The topics included in the guidelines and addressed in detail in Langeberg Municipality's WSDP are as follows:

- Settlements and Demographics
- Service Levels
- Water Services Infrastructure Management (Infrastructure)
- Water Services Infrastructure Management (O&M)
- Conservation and Demand Management
- Water Resources
- Financial
- Institutional Arrangements and Customer Care

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

- All WSAs must develop a WSDP.
- A new plan must be developed every five years and the plan should be updated as necessary and appropriate in the interim years.
- The WSDP must be integrated with the IDP of the municipality, as required in terms of the Municipal Systems Act.
- The WSDP must integrate water supply planning with sanitation planning.
- The WSDP must integrate technical planning with social, institutional, financial, and environmental planning. The planning of capital expenditures must also be integrated with the associated operation and maintenance requirements and expenditures.
- The WSDP must be informed by the business plans developed by water services providers and with the plans of any regional water services providers, as relevant.
- The plan must consider the impact of HIV/Aids on future water demand.
- The WSDP must integrate with the catchment management strategy.
- The planning process must consider 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 2017-2022 WSDP for Langeberg Municipality includes the following documents.

- WSDP-IDP Sector Input Report (Executive Summary Report that can be used for Council approval and the Public Participation Process)
- Water Services Development Plan: Administration, Information and Comprehensive Overview Report
- Water Services Development Plan: Future Demand and Functionality Requirements Report

The WSDP was approved by Council on the 1st of December 2020.

The purpose of this report is to provide relevant and summarised WSDP inputs for incorporation into Langeberg 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 Langeberg Municipality.

Section C: Water Services Existing Needs Perspective: Gives an overview of Langeberg 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 to meet the water services strategies of Langeberg Municipality, as aligned to the outflow from the situation analysis per water services business element.

SECTION A: STATUS QUO OVERVIEW

Langeberg Municipality is situated within the newly established Breede-Gouritz Water Management Area (WMA) and is located within the Cape Winelands District of the Western Cape Province, in which the following Municipalities are also located:

- Witzenberg Municipality;
- Drakenstein Municipality;
- Stellenbosch Municipality; and
- Breede Valley Municipality.

The Cape Winelands District Municipal Area covers an approximate area of 22 309 km² and the Langeberg Municipality Management Area covers an approximate area of 4 517.4 km², which includes 1 184.54 km² of the former Cape Winelands District Municipality's Management Area. The former District Management Area consists mostly of extensive farming, natural veld, and large game farms. Langeberg Municipality consists of twelve (12) individual wards and is the only WSA within this municipal area and is also the bulk Water Services Provider. Langeberg Municipality's Management Area includes the following towns and urban areas (**Water Distribution Systems**):

- Robertson – **Robertson Water Distribution System**;
- McGregor – **McGregor Water Distribution System**;
- Bonnievale – **Bonnievale Water Distribution System**;
- ☐ Ashton – **Ashton Water Distribution System**;
- ☐ Montagu – **Montagu Water Distribution System**;
- ☐ The rural farm areas

The most significant challenges, from a Water Services perspective, are the augmentation of the existing water sources in Bonnievale, Ashton and Montagu, the refurbishment and upgrading of the WTWs, WWTWs, water and sewer pump stations, water distribution networks and sewer drainage networks to accommodate future development, the provision of sustainable basic services to informal settlements and to ensure the provision of basic services to rural communities located on private farms. Strategies and action plans will need to be developed and implemented, in collaboration with farm owners, for the Municipality to fulfil its legal obligations and responsibilities as WSA, regarding the provision of basic services once clear and practical policy guidelines are made available from the DWS and funding is made available.

Physical Perspective:

The Mediterranean climate allows for many outdoor activities and plays an important role in fruit export from the Langeberg Municipality region. The area experiences winter-rainfall, with hot and dry summers. Snow is common on the high mountains during winter, with no prevalence of snow in any of the towns or agricultural areas. The graph below gives an overview of the Annual Rainfall for the last eight financial years for the five towns.

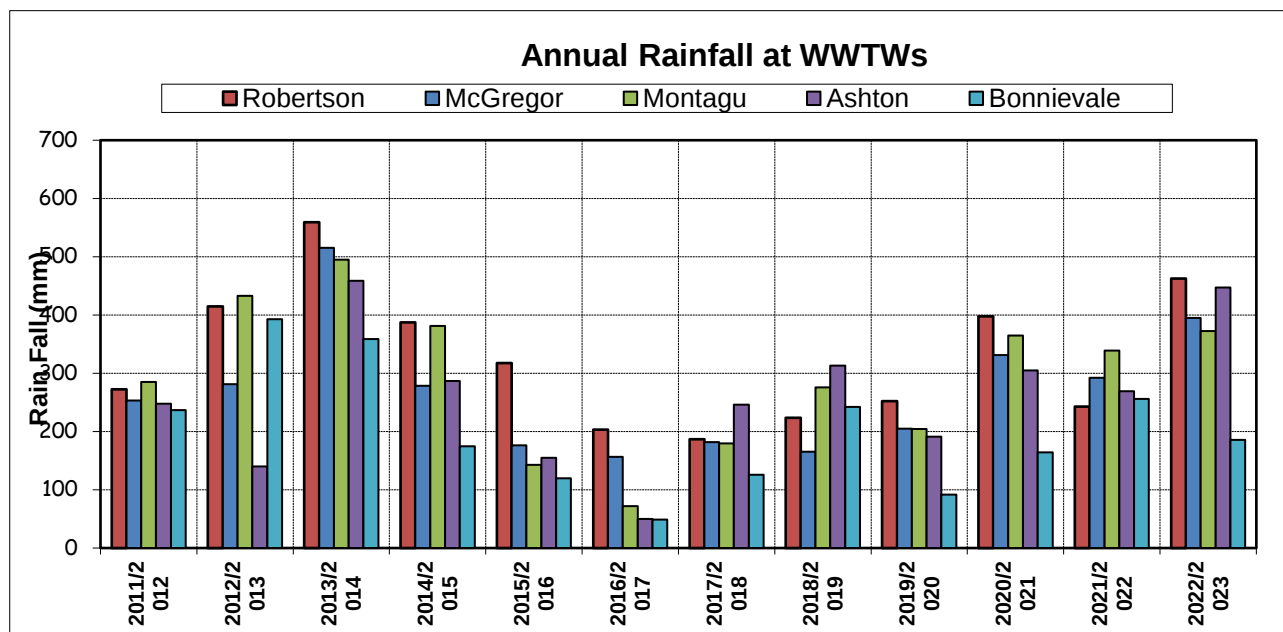


Figure A.1: Annual Rainfall per town.

Climate change: It is necessary for WSAs to develop climate response strategies and include these in their WSDPs, implement WC/WDM measures and reduce levels of NRW and Water Losses. 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.

In terms of adapting for climate change, water systems will need to be more robust and newer / alternative sources of supply may need to be found. Increased skills will be required from water managers and long-term water projections are required. Although an overall decrease in rainfall is generally not forecasted, increased variability in the climate and frequency of extreme events, as well as increased temperature and wind could have an impact on water sources, particularly surface waters. Almost all the bulk water supplied to the towns in Langeberg Municipality's Management Area is from surface water sources.

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

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

- 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 cultural diversity, scenic beauty, unique natural environment, and rich agricultural possibilities make Langeberg Municipality's Management Area one of the most attractive areas in the country – especially to tourists.

The five bio-regions that can be distinguished in terms of the natural environment and economy in Langeberg Municipality's Management Area are as follows:

- Anysberg – the northern Karoo plains much of it within the Anysberg Nature Reserve (Cape Nature);
- The Koo – high lying valley well known for fruit, fruit processing and tourism;
- Keisies Valley – high lying scenic valley with intensive agriculture and start of the R62 tourism route beginning in Montagu.
- Breede River Valley – Intensely farmed, mainly vineyards wine producing area with strong tourism attractions – festivals, accommodation, restaurants, wine tasting. One of the most popular wine routes. Contains main settlements Robertson, Ashton and Bonnievale.
- Riviersonderend Mountain Valleys – high lying series of three valleys – also intensive agriculture, mainly vineyards and tourism, but at a reduced level compared to the activities in the Breede River Valley. McGregor is the main settlement, albeit the smallest in the municipality.

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

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

- Anysberg Nature Reserve, Rooikrans and Drie Kuilen Private Nature Reserves and Matroosberg Mountain Catchment area (taking care to retain the dryland farming area between Drie Kuilen Private Nature Reserve and Matroosberg Mountain Catchment Area;
- Extending the Langeberg Wes Mountain Catchment Area (Waboom mountains) eastwards; and
- Creating formal or informal protected corridors across the Breede River Valley linking the Langeberg range to the Riviersonderend Mountains. These are likely to be the most challenging.

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

TOPIC 1: SETTLEMENTS AND DEMOGRAPHICS

The tables below give an overview of the population and households in Langeberg Municipality's Management Area.

Table A.1.1: Settlement Summary		
Section	Value	Assessment Score
1.1 Total Population	121 704	80%
1.2 Total Number of Households (Permanent)	31 051	80%
1.3 Average Household Size	3.87	80%
1.4 Total Number of Settlements	22	80%

Table A.1.2 Summary by Settlement Group (Urban / Rural Split)				
Settlement Type	Settlements	Population	Households	Assessment Score
Rural	2	32 431	8 004	80%
Urban	20	89 273	23 047	80%

Table A.1.3 Assessment Score by Settlement Type						
Main Type	Settlement Type	Settlements	Population	Households	Avg. Household Size	Assessment Score
Rural	Farming	2	32 431	8 004	4.05	80%
Urban	Urban - Informal Settlements (Squatter Camp)	7	10 064	2 528	3.98	80%
Urban	Urban - Formal Town	12	79 049	20 506	3.85	80%
Urban	Working Towns and Services Centres – Mines, Prisons etc.	1	160	13	12.3	80%

Table A.1.4 Amenities Summary (Health & Educational facilities)		
Amenity Type	Number of Amenities	Assessment Score
Health Facilities	17	80%
Educational facilities	70	80%

The size of the population provides an indication of the volume of demand for government services in a particular area. It also serves as a planning measure to assist budget planners to match available resources to the relative demand for infrastructural and social services including water, sanitation, electricity, housing, and health care.

Langeberg Municipality's IDP, Review 2022/23, indicates the current population at 121 704 persons and the 2025 estimated population at 126 464 persons which equates to an average annual growth rate of 1.3%. The number of households based on average household size of 3.9 persons/household (based on Community Survey of 2016 from Statistics South Africa of households and household size in the Langeberg Municipality) is 31 051.

Table A.1.5: Estimated Future Annual Population Growth Percentages per Distribution System	
Town	Estimated future annual Population Growth %
Robertson	2.50%
McGregor	2.50%
Bonnievale	2.50%
Ashton	2.00%
Montagu	3.50%
Farms	1.00%
Total	2.15%

The table below gives an overview of the population and households and the water service level categories in Langeberg Municipality's Management Area.

Table A.1.6: Water Services Overview (Water)														
Settlement Type	2022/2023		2021/2022		Water category									
	Households	Population	Households	Population	Adequate: Formal	Adequate: Informal	Adequate: Shared 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			
Sub-Total	0	0	0	0										
Formal Town					Adequate		Below RDP				None			
Robertson	8,321	32,381	8,320	31,380	P		P							
McGregor	1,095	3,775	1,095	3,775	P		P							
Bonnievale	2,381	9,141	2,381	9,003	P		P							
Ashton	3,503	14,065	3,503	13,889	P		P							
Montagu	5,219	19,847	5,219	19,595	P		P							
Sub-Total	20,519	79,209	20,518	77,642	5	0	5	0	0	0	0	0	0	0
Townships					Adequate		Below RDP				None			
Sub-Total	0	0	0	0										
Informal Settlements					Adequate		Below RDP				None			
Robertson	1,127	4,395	1,077	4,308		P								P
McGregor	32	175	32	128		P								
Bonnievale	588	2,352	588	2,352		P								
Ashton	509	2,054	509	2,036										P
Montagu	272	1,088	272	1,088		P								
Sub-Total	2,528	10,064	2,478	9,912	0	4	0	0	0	0	0	0	0	2
Working towns & service centres					Adequate		Below RDP				None			
Sub-Total	0	0	0	0										
Sub-Total: (Urban)	23,047	89,273	22,996	87,554	5	4	5	0	0	0	0	0	0	2
RURAL														
Rural / Farming					Adequate		Below RDP				None			
Langeberg Rural	8,004	32,431	8,004	32,408	P		P							P
Sub-Total	8,004	32,431	8,004	32,408	1	0	1	0	0	0	0	0	0	1
Informal Settlements					Adequate		Below RDP				None			
Sub-Total	0	0	0	0										
Sub-Total (Rural)	8,341	32,431	8,004	32,408	1	0	1	0	0	0	0	0	0	1
TOTAL	31, 051	121,704	31,000	119,962	6	4	6	0	0	0	0	0	0	3

TOPIC 2: SERVICE LEVELS

The National Norms and Standards for Domestic Water and Sanitation Services, as published in the Government Gazette No.41100 of 8 September 2017, make provision for the following norms and standards for levels of water supply and sanitation services:

Table A.2.1: Norms and Standards for Levels of Water Supply Services			Interim provision: People access a minimum of 25 l/c/d of acceptable quality water within 24 hours of disruption, normal service to be restored within 7 days.
Full level of service: People access and pay for more than 90 l/c/d at high pressure.	Interim Full	Full provision: People access a minimum of 50 l/c/d of SANS241 quality water on demand at the boundary of the yard, metered and tarified.	
Middle level of service: People access and pay for 51-90 l/c/d at medium pressure.	Interim Upper	Upper provision: People access a maximum of 90 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tarified.	
	Interim Intermediate	Intermediate provision: People access more than 50 l/c/d but less than 90 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tarified.	
Minimum level of service: People access 25-50 l/c/d at low to medium pressure, use of more than 25 l/c/d is paid for.	Interim Basic Plus	Basic Plus provision: People access more than 25 l/c/d but less than 50 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tarified.	
	Interim Basic	Basic provision: People access a minimum of 25 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered and tarified.	
	Interim Free Basic	Free basic provision: People access a minimum of 25 l/c/d of SANS241 quality water from an improved source at the boundary of the yard, metered.	
	Intermittent	Intermittent provision: People access a minimum of 1500 l/household/week of acceptable quality water on a weekly basis within 100m, which is metered.	
Bulk service: Source of potable water to be provided to people, which is metered in all circumstances.			
No service / provision = backlog: People access water from insecure or unimproved sources, or sources that are too distant, too time consuming or are of poor quality.			

Table A.2.2: Norms and Standards for Levels of Sanitation Services		
Hygiene promotion; Prevention of pollution; Re-use / recycle; Operation and Maintenance; Metering and tariffing; Solid Waste Management; Asset Management		
Full level: Full concern for human health, environment, and sustainability of interconnected systems.	Full services	In-house facility: Storm water, wastewater/excreta, greywater, solid waste are collected and managed to achieve maximum benefits from treatment and re-use of water and nutrients.
		In-house facility: Access to a pleasant, safe, reliable and properly maintained facility for 24 hours a day, with control of nutrients in human excreta, wastewater and greywater.
Basic level: Remove excreta from the environment through treatment, pathogen reduction, resource recovery and nutrient reuse.	Free basic services	Toilet with functional hand washing facility in the yard: Access to a pleasant, safe and reliable facility for 24 hours a day, including privacy, personal safety and shelter through a subsidy for free. Maintenance of the facility is for free and is the responsibility of services provider.
	Basic services	Toilet with functional hand washing facility in the yard. Access to a pleasant, safe and reliable facility for 24 hours a day, including privacy, personal safety and shelter through a capital subsidy. Maintenance of the facilities is not for free and is the responsibility of the household / owner.
Interim level: Blocking the spread of faecal-oral diseases through proper excreta containment at a fixed point.	Excreta containment	Household, shared or communal toilets with functional hand washing facilities: Access to safe, reliable and properly maintained toilet and hand washing facility, free of charge, within 200m of the dwelling, which at a minimum safely contains human excreta. Maintenance is the responsibility of the services provider. To be phased out by 2030.
No service / provision = backlog: People practice open defecation or access an unimproved sanitation facility, such as pit toilets and bucket toilets. To be eliminated by 2030.		

Emergency level: People access pleasant, safe, reliable and properly maintained improved toilets and hand washing facility on the premises in close proximity to the temporary dwelling within 24 hours and for duration of event.

All residents on formal erven in the urban areas of Langeberg Municipality's Management Area have access to water and sanitation services and free basic water and sanitation services are provided to all indigent registered households. Households in informal areas are provided with communal services as an intermediary measure. There are some informal settlements without basic water and sanitation services and at some informal settlements the ratios of communal water and sanitation services is higher than 25hh/tap and 5hh/toilet facility. It is also estimated that there might still be households on the farms in the rural areas with existing service levels below RDP standards, which can only be verified through a detail survey.

The table and graph below give an overview of the water service delivery access profile of Langeberg Municipality.

Table A.2.3: Residential Water Services Delivery Access Profile: Water

Census Category	Description	Year 0 FY2022/23		Year - 1 FY2021/22		Year - 2 FY2020/21	
		Nr	%	Nr	%	Nr	%
	WATER (ABOVE MIN LEVEL)						
Piped (tap) water inside dwelling/institution	House connections	20,958	67%	20,957	67%	20,786	67%
Piped (tap) water inside yard	Yard connections	7,194	23%	7,194	23%	7,046	23%
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	Standpipe connection < 200 m	966	4%	966	4%	1,138	4%
	Sub-Total: Minimum Service Level and Above	29,118	94%	29,117	94%	28,970	94%
	WATER (BELOW MIN LEVEL)						
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	Standpipe connection: > 200 m < 500 m	162	1%	162	1%	162	1%
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /Institution	Standpipe connection: > 500 m < 1 000 m	6	0%	6	0%	6	0%
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	Standpipe connection: > 1 000 m	6	0%	6	0%	6	0%
No access to piped (tap) water	No services	1 759	6%	1,709	6%	1,709	6%
	Sub-Total: Below Minimum Service Level	1,933	6%	1,883	6%	1,883	6%
	Total number of households	31,051	100%	31,000	100%	30,853	100%

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

Table A.2.4: Residential water service levels							
Service Level	Robertson	McGregor	Bonnievale	Ashton	Montagu	Farms	Total
No Water Services	0	0	0	0	0	76 ²⁾	76
Below RDP: Infrastructure Upgrade	0	0	0	0	0	0	0
Below RDP: Infrastructure Extension	0	0	0	0	0	174 ³⁾	174
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0
Total Basic Need (RDP)	0	0	0	0	0	250	250
Below Housing Interim ⁴⁾	1002	0	0	509	0	0	1 461
Adequate Housing Permanent ⁵⁾	125	32	588	0	272	0	1 017
Total Housing Need	1 127	32	588	509	272	0	2 528
Standpipes	0	0	0	0	0	121	121
Yard Connections ⁶⁾	2 342	0	655	771	2 020	1 406	7 194
House Connections ¹⁾	5 979	1 095	1 726	2 732	3 199	6 227	20 957
Total Adequate	8 321	1 095	2 381	3 503	5 219	7 754	28 273
Total	9 448	1 127	2 969	4 012	5 491	8 004	31 051

Notes: 1) Estimated number of households with water inside houses, as projected from Census 2011 data.

2) Census 2011: Number of households with no access to piped (tap) water 76

3) Census 2011: Number of households with communal services (200m – 500m) 162, (500m – 1000m) 6 and (>1000m) 6.

4) Below Housing Interim in the above table is the number of households in informal areas without basic water services, as confirmed by the Municipality (June 2023).

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

6) Estimated number of backyard dwellers (Projected number of households – residential CUs – households in informal areas)

7) There are no households on formal erven in the urban areas with water services below RDP standard. All formal erven are supplied with water connections inside the erven.

Table A.2.5: Improvement in Eradicating the Water Backlog					
Settlement	Urban / Rural	2018/19		2017/18 (-Y1)	
		Water backlog HH	Water Backlog Population	Water backlog HH	Water Backlog Population
Robertson	Urban	1 118	4 472	1 118	4 472
McGregor	Urban	0	0	0	0
Bonnievale	Urban	0	0	0	0
Ashton	Urban	414	1 656	414	1 656
Montagu	Urban	0	0	0	0
Farms	Rural	250	1 020	250	1 020
		1 782		1 782	

Table A.2.6: Water Supply Level Profile		
Water Profile	Totals	Assessment Score
Total Households with a water need (Irrelevant the type of need)	1 782	80%
Total Households below RDP	1 782	80%
Piped water inside the dwelling/house-Households	22 997	80%
Piped water inside yard-Households	3 754	60%
Piped water distance <200m - Households	698	80%
Piped water distance >200m - Households	174	80%
Borehole in the yard - Households	0	80%
Rain-water tank in yard - Households	0	80%
Water vendor-carrier/tanker - Households	0	80%
Stagnant water - dam/pool - Households	0	80%
Flowing water/spring/ stream/river - Households	0	80%
Water Other – Households (Include not water)	1 608	60%

Table A.2.7: Water Reliability Profile		
Section: Water Reliability Profile	Totals	Assessment Score
Total Number of Households having Reliable Service	27 449	80%
Total Number of Households NOT having Reliable Service	1 782	80%

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

Table A.2.8: Residential Water Services Delivery Access Profile: Sanitation							
Census Category	Description	Year 0 FY2022/23		Year - 1 FY2021/22		Year - 2 FY2020/21	
		Nr	%	Nr	%	Nr	%
	SANITATION (ABOVE MIN LEVEL)						
Flush toilet (connected to sewerage system)	Waterborne	19,917	64%	19,916	64%	19,745	64%
	Waterborne: Low Flush	0	0%	0	0%	0	0%
Flush toilet (with septic tank)	Septic tanks / Conservancy	7,557	24%	7,557	24%	7,417	24%
Chemical toilet	Non-waterborne (above min. service level)	48	0%	48	0%	48	0%
Pit toilet with ventilation (VIP) and UDS		41	0%	41	0%	41	0%
Other / Communal Services		770	3%	770	3%	942	3%
	Sub-Total: Minimum Service Level and Above	28,333	91%	28,332	91%	28,193	91%
	SANITATION (BELOW MIN LEVEL)						
Pit toilet without ventilation	Pit toilet	79	0%	79	0%	79	0%
Bucket toilet	Bucket toilet	194	1%	194	1%	194	1%
Other toilet provision (below min. service level)	Other	220	1%	220	1%	212	1%
No toilet provisions	No services	2,225	7%	2,175	7%	2,175	7%
	Sub-Total: Below Minimum Service Level	2,718	9%	2,668	9%	2,660	9%
	Total number of households	31,051	100%	31,000	100%	30,853	100%

The existing sanitation service levels in Langeberg Municipality's Management Area are estimated as follows (June 2023):

Table A.2.9: Residential Sanitation Service Levels							
Service Levels	Robertson	McGregor	Bonnievale	Ashton	Montagu	Farms	Total
No Sanitation Services	0	0	0	0	0	467 ²⁾	467
Below RDP: Infrastructure Upgrade	0	0	0	0	0	533 ³⁾	533
Below RDP: Infrastructure Extension	0	0	0	0	0	0	0
Below RDP: Infrastructure Refurbishment	0	0	0	0	0	0	0
Below RDP: O&M Needs	0	0	0	0	0	0	0
Below RDP: Water Resource Needs	0	0	0	0	0	0	0
Below RDP: Infrastructure and O&M Needs	0	0	0	0	0	0	0
Below RDP: Infrastructure, O&M and Water Resource Needs	0	0	0	0	0	0	0
Total Basic Need (RDP)	0	0	0	0	0	1 000	1 000
Below Housing Interim ⁴⁾	1 077	0	0	509	0	0	1 536
Adequate Housing Permanent ⁵⁾	50	32	588	0	272	0	942
Total Housing Need	1 127	32	588	509	272	0	2 528
No Waterborne (VIP)	0	0	0	0	0	41	41
Waterborne Low Flush	0	0	0	0	0	0	0
Septic Tanks / Conservancy Tanks	0	541	53	8	0	6 963	7 557
Waterborne	8 320	554	2 328	3 495	5 219	0	19 916
Total Adequate ¹⁾	8 320	1 095	2 381	3 503	5 219	7 004	27 522
Total Residential Households	9 448	1 127	2 969	4 012	5 491	8 004	31 051

Notes: 1) Include Backyard dwellers

2) Census 2011: Number of households with no toilet facility in rural areas 467.

3) Census 2011: Number of households in rural areas with existing buckets 194, chemical toilets 48, pit toilets without ventilation 79 and "other" 212.

4) Inadequate Housing Interim in the above table is the number of households in informal areas without basic sanitation services, as confirmed by the Municipality (June 2023).

5) Inadequate Housing Permanent in the above table is the number of households in informal areas with communal ablution facilities. The number of households with communal services in informal areas was confirmed by the Municipality.

6) There are no households on formal erven in the urban areas with sanitation services below RDP standard.

Table A.2.10: Improvement in Eradicating the Sanitation Backlog

Settlement	Urban / Rural	2018/19		2017/18 (-Y1)	
		Sanitation backlog HH	Sanitation Backlog Population	Sanitation backlog HH	Sanitation Backlog Population
Robertson	Urban	1 193	4 394	1 193	4 394
McGregor	Urban	0	0	0	0
Bonnievale	Urban	0	0	0	0
Ashton	Urban	414	1 643	414	1 643
Montagu	Urban	0	0	0	0
Farms	Rural	1 000	4 078	1 000	4 078
		2 607		2 607	

Table A.2.11: Sanitation Level of Service

Section: Sanitation Service Infrastructure Supply Level Profile	Totals	Assessment Score
Bucket toilet - Households	194	60%
Pit without ventilation - Households	79	60%
Pit toilet with ventilation (VIP) - Households	253	60%
Chemical Toilet - Households	48	60%
Flush toilet (with septic / conservancy tank) - Households	7 557	80%
Flush toilet (connected to sewerage system) - Households	19 917	80%
None - Households	2 225	60%

Table A.2.12: Sanitation Reliability Profile

Section: Sanitation Reliability Profile	Totals	Assessment Score
Total number of households having reliable service	26 624	80%
Total number of households not having reliable service	2 607	60%
Infrastructure to be upgraded: None to VIP (HH)	679	60%
Infrastructure requirement: Bucket to VIP (HH)	194	60%
Infrastructure requirement: None to waterborne	1 607	60%
Infrastructure to be upgraded: Pit to VIP (HH)	79	60%
Number of households NOT having reliable service due to: Functionality	41	60%

Table A.2.13: Direct Backlog (Water and Sanitation)

Direct Backlog (Water & Sanitation)	Totals	Assessment Score
Direct settlement backlog water households. Total household of settlement with a water need (irrelevant the type of need)	1 782	60%
Direct settlement backlog water population. Total population of settlement with a water need (irrelevant the type of need)	7 148	60%
Direct settlement backlog sanitation households. Total household of settlement with a sanitation need (irrelevant the type of need)	2 607	60%
Direct settlement backlog sanitation population. Total population of settlement with a sanitation need (irrelevant the type of need)	10 115	60%

The total number of households in informal areas is currently 2 478. The table below gives a summary of the communal services levels in the informal areas in Langeberg Municipality's Urban Management Areas.

Table A.2.14: Communal Service Levels in the Informal Areas						
Area	Informal Settlement	No. of Households	Number of Toilets	Household / Toilet	Number of Taps	Households / Tap
Robertson	Nkqubela (Enkanini & Kanana)	1 005	10	100.5	5	201.0
	Robertson North	72	0	0	6	40.6
McGregor	McGregor	32	28	1.1	18	1.8
Bonnievale	Boekenhoutskloof	588	29	20.3	18	32.7
Ashton	Cogmanskloof	135	0	0	-	67.2
	Zolani	374	0	0	-	187.0
Montagu	Mandela Square	272	7	38.9	9	30.2
Total		2 478	74	160.8	60	560.5

The table below gives a summary of the number of monthly accounts that went out for the last seven financial years (pre-paid water and Availability included).

Table A.2.15: Summary of Number of Monthly Accounts that went out for the Last Seven Financial Years								
Year	Water Services				Sanitation Services			
	Residential	Informal	Other	Total	Residential	Informal	Other	Total
2012/2013	14 546			16 066	14 755			14 829
2013/2014	14 382	291		16 236	14 627	290		15 275
2014/2015	14 554	262	1 597	16 413	14 792	261	342	15 395
2015/2016	15 090	235	1 625	16 950	14 902	234	334	15 470
2016/2017	15 134	234	2 596	17 964	14 944	234	303	15 481
2017/2018	15 177	200	2 596*	17 973	15 114	200	413	15 727
2018/2019	15 217	200	2 596	18 013	15 154	200	413	15 767

Note: 2018/2019 CUs were estimated, because data is not available in the same format anymore.

Public Amenities

Table A.2.16: Water Service Levels: Education and Health Facilities				
Associated services facility	Number of facilities	Facilities with No Services	Facilities with Inadequate Services	Total Potential Cost (basic level) (RM)
Water				
Education Plan				
Primary school	42	-	-	-
Secondary school	4	-	-	-
Tertiary	10	-	-	-
Combined	5	-	-	-
Special needs	-	-	-	-
Other	9	-	-	-
Total	70	-	-	-
Health Plan				
Hospitals	2	-	-	-
Health Centres	-	-	-	-
Clinics and Mobile Clinics	13	-	-	-
Other	2	-	-	-
Total	17	-	-	-

Table A.2.17: Sanitation Service Levels: Education and Health Facilities				
Associated services facility	Number of facilities	Facilities with No Services	Facilities with Inadequate Services	Total Potential Cost (basic level) (RM)
Sanitation				
Education Plan				
Primary school	42	-	-	-
Secondary school	4	-	-	-
Tertiary	10	-	-	-
Combined	5	-	-	-
Special needs	-	-	-	-
Other	9	-	-	-
Total	70	-	-	-
Health Plan				
Hospitals	2	-	-	-
Health Centres	-	-	-	-
Clinics and Mobile Clinics	13	-	-	-
Other	2	-	-	-
Total	17	-	-	-

All the schools and Community Learning Centres in the urban areas are supplied with higher levels of water and sanitation services. The water and sanitation service levels of the schools in the rural areas need to be verified. All the hospitals and clinics in the urban areas are supplied with higher levels of water and sanitation services.

TOPIC 3: WATER SERVICES ASSET MANAGEMENT

Table A.3.1: Infrastructure Components										
Assets	Boreholes	Abstraction Points	WTW	Water Pump Stations	Sewer Pump Stations	Water Pipelines	Sewer Pipelines	Reservoirs	WWTW	Assessment Score
Total number of components / km of pipeline / units	5	14	5	9 (RW) 21 (PW)	20	266.424km (Ret.) 42.288km (Bulk)	17.1km (Rising) 247.6km (Gravity)	26	5	80%

The table below gives an overview of the major **water infrastructure** components, for the various distribution systems, in Langeberg Municipality's Management Area.

Table A.3.2: Summary of Existing Main Water Infrastructure					
Water Distribution System	Bulk Supply (Resources)	WTW (Capacity in Ml/d)	Bulk and Network Reticulation (km)	Number of Water Pump Stations in Network	Number of reservoirs (Total Storage, Ml)
Robertson	Langeberg Mountains (Dams)	10.140	1.766 (Bulk) 90.632 (Ret.)	2 (RW) 4 (TW)	5 (14.700)
	Brandvlei Irrigation Canal				
	Hoops River				
McGregor	Houtbaais River	0.600	0.596 (Bulk) 12.561 (Ret.)	3 (RW) 1 (TW)	2 (2.450) 1 (Not in use)
Bonnievale	Zanddrift Irrigation Canal	5.000	1.921 (Bulk) 48.839 (Ret.)	1 (RW) 4 (TW)	3 (6.750)
	Direct abstraction from Breede River				
Ashton	Robertson Irrigation Canal	11.910	13.937 (Bulk) 47.208 (Ret.)	3 (RW) 4 (TW)	4 (8.900)
	Cogmanskloof Irrigation Scheme				
	Breede River				
Montagu	Kruis River	5.180	24.068 (Bulk) 67.184 (Ret.)	8 (TW)	11 (10.220)
	Rietvlei River				
	Cogmanskloof Irrigation Scheme				
	Breede River (Supply from Ashton)				
Total		32.830	42.288 (Bulk) 266.424 (Ret.)	30	26 (43.020)

The table below gives an overview of the major **sewerage infrastructure** components, for the various drainage systems, in Langeberg Municipality's Management Area.

Sewer Distribution System	Sewer Drainage Reticulation (km)	Number of Sewer Pump Stations	WWTW (Capacity in Ml/d)
Robertson	3.3 (Rising), 80.4 (Gravity)	3	4.300
McGregor	0.0 (Rising), 18.9 (Gravity)	0	0.300
Bonnievale	6.1 (Rising), 37.6 (Gravity)	9	1.800
Ashton	3.2 (Rising), 41.3 (Gravity)	4	2.450
Montagu	4.5 (Rising), 69.4 (Gravity)	4	3.500
Total	17.1 (Rising), 247.6 (Gravity)	20	12.350

Component	Refurbishment Need				O&M Occurrence				Observation			
	High	Medium	Low	None	Regular	Periodic	Sporadic	None	Dysfunctional	Operational	Prime Condition	Vandalised
Boreholes	0	0	0	5	0	0	5	0	0	0	5	0
Abstraction points	0	0	0	14	0	0	14	0	0	14	0	0
Bulk water pipelines	0	0	5	0	0	0	5	0	0	5	0	0
Reservoirs	2	3	2	19	0	0	26	0	1	19	6	0
Water pump stations	4	8	11	7	0	0	30	0	0	26	4	0
WTW	0	1	4	0	5	0	0	0	0	5	0	0
Bulk sewer pipelines	0	0	5	0	0	0	5	0	0	5	0	0
Sewer pump stations	1	0	14	5	0	0	20	0	0	15	5	0
WWTW	1	0	4	0	5	0	0	0	0	4	1	0

Asset Management: An Asset Management Policy is in place for Langeberg Municipality. The purpose of the Asset Management Policy is to prescribe to all custodians at the Municipality mandatory procedures for the financial and logistical management of assets, and to:

- Provide a formal set of financial procedures that can be implemented to ensure that Langeberg Municipality's asset policies are achieved and are following the MFMA, GRAP and other related legislation;
- Ensure that effective controls are communicated to management and staff through clear and comprehensive written documentation;
- Ensure that the Municipality safeguards and controls the assets of the municipality;
- Optimise asset usage; and
- Emphasis a culture of accountability over assets.

Langeberg Municipality updated their current Asset Register during the 2022/2023 financial year. The tables below give an overview of Langeberg Municipality's Water and Sewerage assets as included in the Municipality's Asset Register on the 30th of June 2023.

Water Infrastructure: The opening costs and book value of the water infrastructure of Langeberg Municipality is summarised in the table below (June 2023):

Asset Type	Opening Costs	Book Values	% Book Value / Opening Cost
Dam	R5 245 385.90	R5 463 176.88	104%
Water Pump Stations	R16 581 248.61	R24 342 988.50	147%
Reservoirs	R36 991 089.32	R24 878 752.36	67%
Boreholes	R503 147.25	R536 513.80	107%
Water Pipelines	R76 111 662.15	R74 676 175.58	98%
WTWs	R20 434 630.59	R22 939 130.45	112%
Total	R155 867 163.82	R152 836 737.57	98%

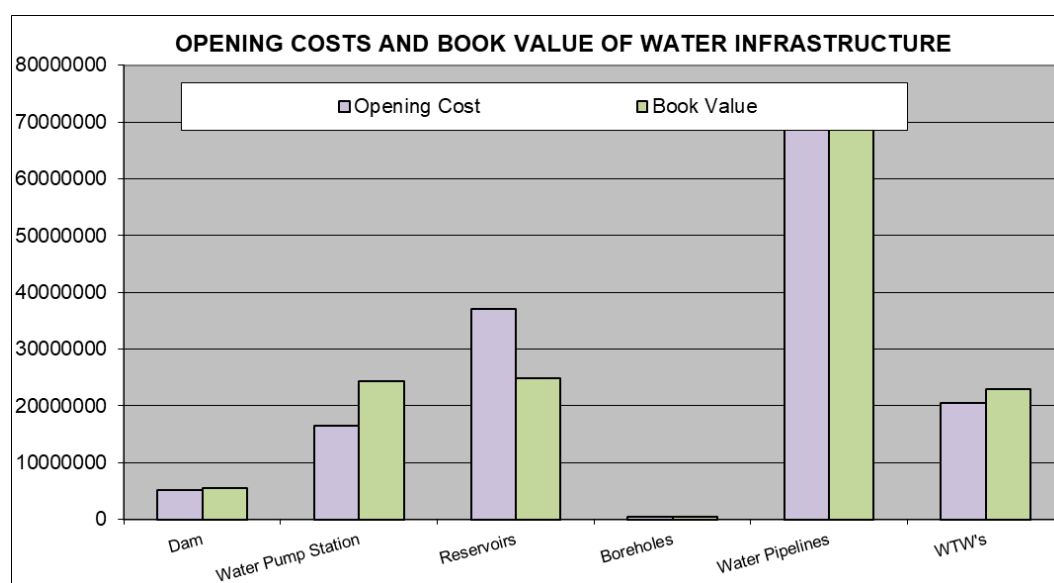


Figure A.3.1: Opening Cost and Book Values of the Water Infrastructure

The percentage book value over opening cost indicates that 2% of the value of the water supply infrastructure has been consumed.

The following table gives an overview of the remaining useful life by facility type for the water infrastructure (June 2023):

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Dam	R216 485.28	R22 382.58	R96 305.25	R769 327.93	R4 140 884.86
Water Pump Stations	R317 953.21	R4 399 840.43	R9 205.89	R7 965 868.01	R3 888 381.07
Reservoirs	R60 480.83	R815 736.54	R10 963.52	R13 870 471.55	R22 233 436.88
Boreholes	R5 147.78	R0	R0	R497 999.47	R0
Water Pipelines	R1 104 078.75	R2 196 100.79	R4 754 402.96	R13 843 425.48	R54 213 654.17
WTWs	R2 999 333.24	R1 062 466.23	R822 779.92	R1 188 174.36	R14 361 876.84
Total	R4 703 479.09	R8 496 526.57	R5 693 657.54	R38 135 266.80	R98 838 233.82

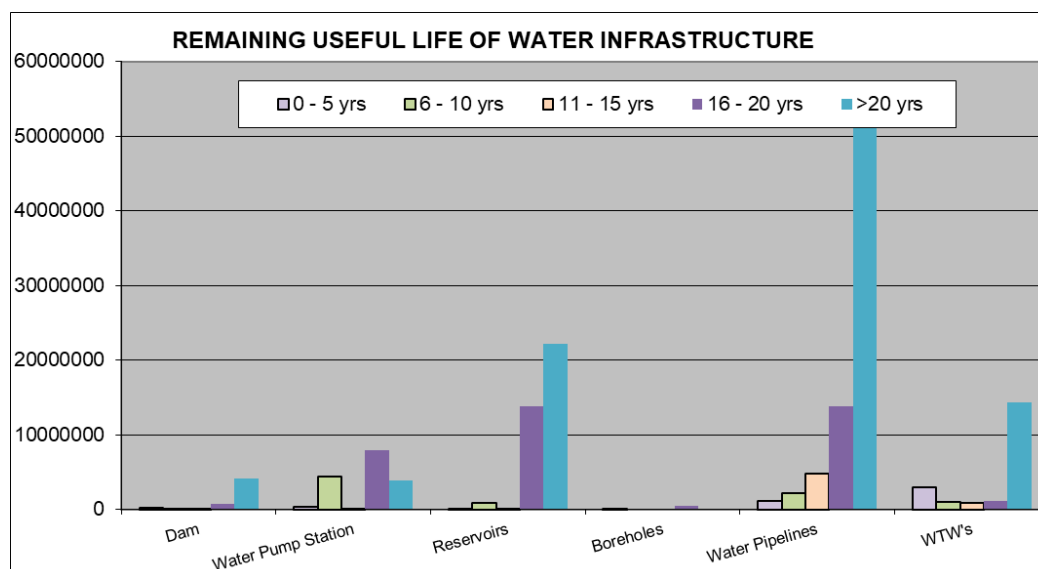


Figure A.3.2: Remaining Useful Life of the Water Infrastructure

The following table gives an overview of the age distribution by facility type for the water infrastructure (June 2023):

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Dam	R0	R4 617 801	R20 632	R1 889 612	R2 488 480
Water Pump Stations	R7 207 640	R7 664 116	R1 988 170	R427 382	R956 998
Reservoirs	R7 691 623	R11 365 327	R8 090 710	R4 085	R5 304 848
Boreholes	R625 550	R0	R33 353	R0	R0
Water Pipelines	R32 900 045	R40 108 120	R7 219 852	R259 357	R12 568 536
WTWs	R3 750 817	R10 982 451	R11 044 236	R348 736	R2 970 543
Total	R52 175 675	R74 737 815	R28 396 953	R2 929 172	R24 289 405

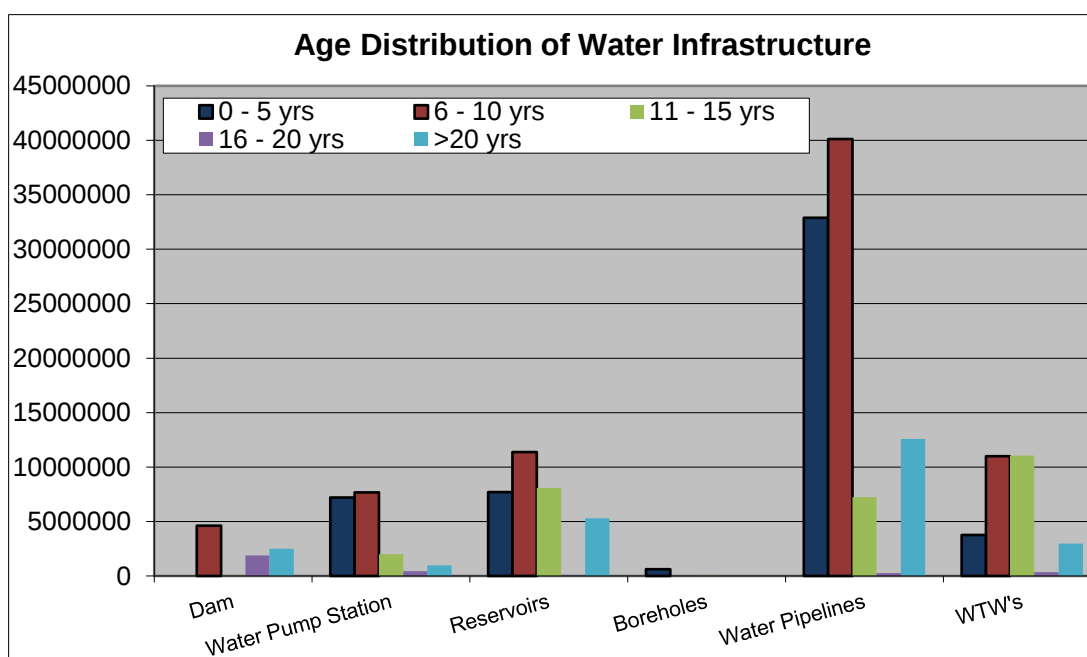


Figure A.3.3: Age Distribution of the Water Infrastructure

The asset renewal needs for the water infrastructure assets over the next 10 years is R3.534 million per year. The reinvestment required is R15.465 million in the first 5 years and R19.877 million in the second 5-year period. The age of 2% of the water infrastructure assets is greater than 20 years.

Sewerage Infrastructure: The opening costs and book values of the sewerage infrastructure of Langeberg Municipality is summarised in the table below (June 2023):

Table A3.8 Opening Costs and Book Values of all Sewerage Infrastructure			
Asset Type	Opening Costs	Book Values	% Book Value / Opening Cost
Toilet Facilities	R2 002 759.99	R7 600 717.11	3.8%
Sewer Pump Station	R15 196 635.53	R7 502 017.74	49%
Sewer Reticulation Pipeline	R39 081 349.18	R40 641 550.73	104%
WWTWs	R51 795 881.30	R35 716 628.12	69%
Totals	R108 076 626.00	R91 460 913.40	84%

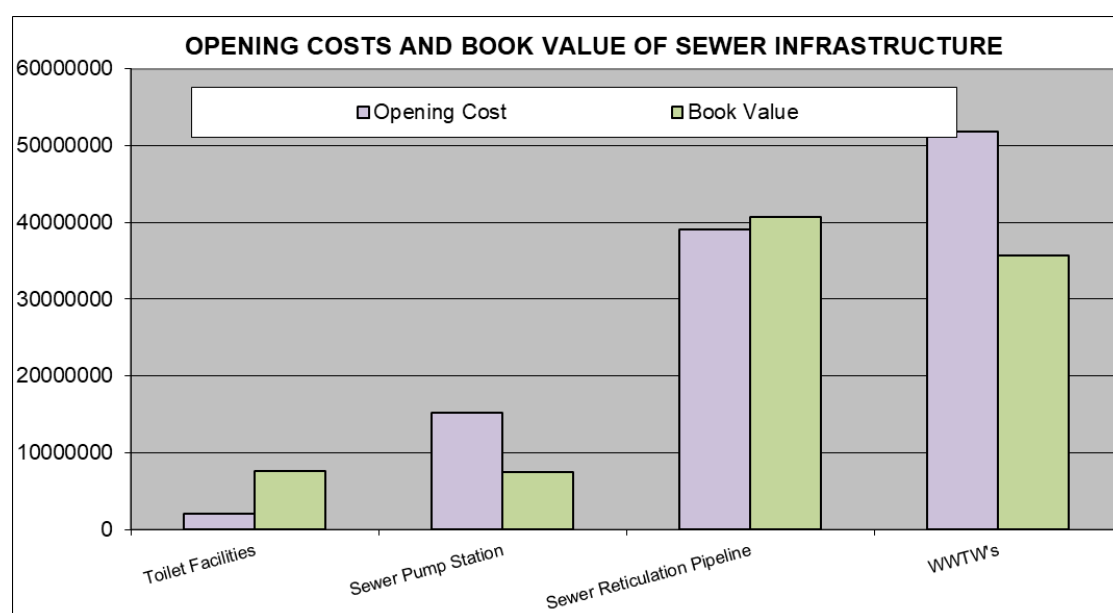


Figure A.3.4: Opening Costs and Book Values of the Sewerage Infrastructure

The percentage book value over opening cost indicates that 24% of the value of the sewerage infrastructure has been consumed. The table below gives an overview of the RUL distribution per facility for the sewerage infrastructure (June 2023).

Table A.3.9: Overview of the RUL by Facility Type for the Sewerage Infrastructure (Opening Costs)					
Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Toilet Facilities	R910 759.62	R302 443.65	R0	R78 422.95	R711 133.77
Sewer Pump Station	R249 157.87	R239 437.02	R4 933 261.41	R8 759 354.36	R1 015 424.87
Sewer Reticulation Pipeline	R718.05	R318 544.09	R10 732 010.90	R8 891 852.93	R19 138 223.21
WWTWs	R20 168 112.69	R6 363 569.27	R215 369.82	R1 694 084.88	R23 354 744.64
Totals	R21 328 748.23	R7 223 994.03	R15 880 642.13	R19 423 715.12	R44 219 526.49

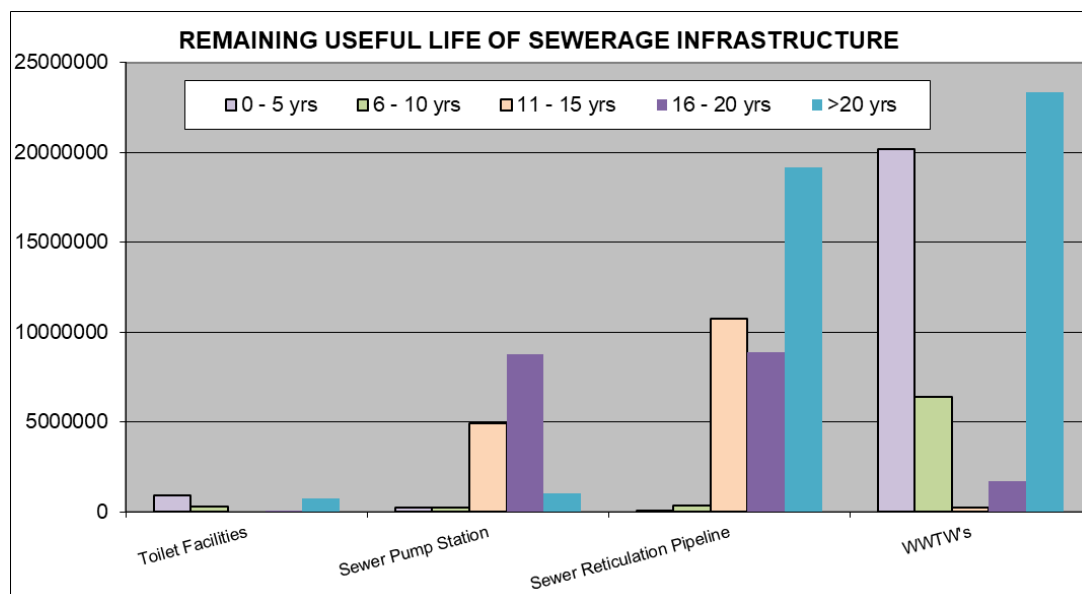


Figure A.3.5: Remaining Useful Life of the Sewerage Infrastructure

The following table gives an overview of the age distribution by facility type for the sewerage infrastructure (June 2023):

Asset Type	0 – 5 yrs	6 – 10 yrs	11 – 15 yrs	16 – 20 yrs	> 20 yrs
Toilet Facilities	R0	R1 588 990	R0	R292 193	R0
Sewer Pump Station	R7 045 014	R1 447 487	R1 604 444	R937 945	R715 741
Sewer Reticulation Pipeline	R26 456 606	R4 567 054	R4 090 598	R25 448	R12 302 550
WWTW's	R24 594 995	R15 686 873	R8 371 038	R761 150	R5 488 116
Totals	R58 096 615	R23 290 404	R14 066 080	R2 016 736	R18 506 407

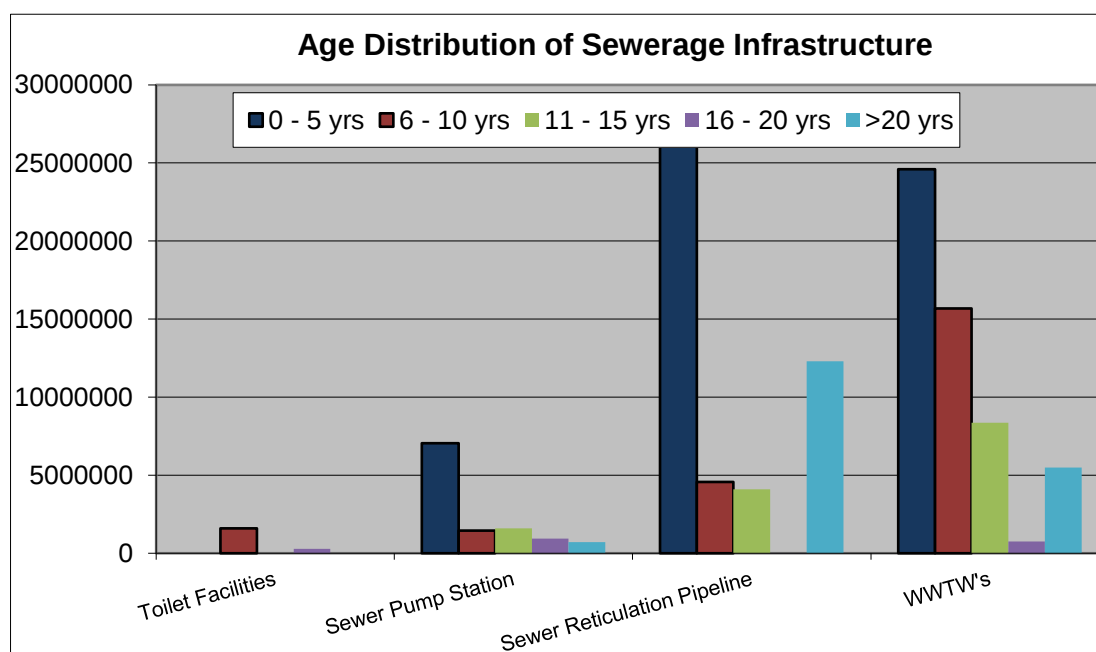


Figure A.3.6: Age Distribution of the Sewerage Infrastructure

The asset renewal needs for the sewerage infrastructure assets over the next 10 years is R1.799 million per year. The reinvestment required is R6.878 million in the first 5 years and R11.112 million in the second 5-year period. The age of 16.0% of the sewerage infrastructure assets is less than 20 years.

Disaster Management Plan: Disaster Management continued to be shared with the Cape Winelands District Municipality. The function is managed efficiently and effectively with an updated Disaster Management Plan for 2019/2020. The responsibility for reducing disaster risk, preparing for disasters, and responding to disasters is shared among:

- all disciplines and employees of the Langeberg Municipality;
- all disciplines and employees of the Cape Winelands District Municipality;
- neighboring local municipalities within the Cape Winelands District Municipality;
- all provincial and national organs of state operating within the municipality;
- all sectors of society within the municipality; and
- all the residents of the municipality.

Untreated Effluent Management Plan: All effluent discharged in the urban areas in Langeberg Municipality are treated at the existing WWTWs and there is no known untreated effluent discharged to the environment. A W₂RAP was prepared for all the wastewater treatment systems.

TOPIC 4: WATER SERVICES OPERATION AND MAINTENANCE

Maintenance is usually practiced in two forms, preventative maintenance, and corrective maintenance. A third form is called design-out maintenance, which is rather an aspect of the design considerations when the infrastructure is planned.

Pipe bursts and other serious damage to pipes immediately interrupts services to the affected area and is rapidly addressed by Langeberg Municipality. O&M is a continuous process for Langeberg Municipality involving various activities, with the ultimate purpose of delivering good quality services to all customers at all times and keeping the percentage of water lost through pipe bursts and other serious damage to pipes as low as possible. Langeberg Municipality's O&M Plan depends on a range of factors such as the age and condition of the water supply system, requirements of the Municipality and DWS as the regulating authority, the availability of staff, plant, equipment, spares, money, and other resources.

Langeberg Municipality also have standby teams available after hours and over weekends, besides the planned and scheduled O&M activities, to allow for unscheduled responses to service breakdowns due to malfunctioning equipment, vandalism, emergency situations, etc. This allows Langeberg Municipality to be able to quickly assess service breakdowns and re-allocate staff and resources to do unscheduled repairs, and then quickly return to the regular and scheduled O&M activities. The technical personnel ensure that sufficient repair materials, consumables and back-up equipment are also readily available in a well-organised store.

Table A.4.1: Operation and Maintenance

Compliance	Existing Groundwater Infrastructure	Existing Surface Water Infrastructure	Existing WTW Infrastructure	Existing WWTW Infrastructure	Existing Pump Station Infrastructure	Existing Bulk Pipeline Infrastructure	Existing Tower & Reservoir Infrastructure	Existing Reticulation Infrastructure
Resources	Min. basic requirement	Min. basic requirement	Min. basic requirement	Min. basic requirement	Min. basic requirement	Min. basic requirement	Min. basic requirement	Min. basic requirement
Information	Min. basic requirement	Below Min. requirement	Min. basic requirement	Min. basic requirement	Below Min. requirement	Min. basic requirement	Below Min. requirement	Min. basic requirement
Activity Control & Management	Min. basic requirement	Min. basic requirement	Min. basic requirement	Min. basic requirement	Below Min. requirement	Min. basic requirement	Min. basic requirement	Min. basic requirement

TOPIC 5: CONSERVATION AND DEMAND MANAGEMENT

A detail WC/WDM Strategy was drafted for Langeberg Municipality during 2014, which was approved by Council. The main water demand management interventions undertaken by Langeberg Municipality over the last few years were as follows:

- Updated Water Master Plans were put in place for all the towns.
- Pipe replacement and maintenance programme for the priority areas with old reticulation networks and frequent pipe failures. All pipe bursts are logged.
- Customer services and complaints system (Burst pipes, complaints, etc.). Standby teams are also in place for immediate repairs of burst pipes.
- Bulk metering and telemetry system, which act as an early warning system for e.g., pipe failures and reservoir overflows.
- Accurate records of bulk meter readings and water usage and calculation of NRW and Water Losses. IWA Water balance models for each of the water distribution systems are kept up to date.
- A rising step block tariff structure for water services. This tariff system discourages the wasteful or inefficient use of water.
- Strict municipal services standards for the installation of new water reticulation for own and private developments.

The table below give a summary of the Treatment Losses, NRW and Water Losses for the various schemes, as calculated through the WSDP process. The 2022/2023 NRW and Water Losses for the various towns are acceptable. The high NRW and Water Losses for McGregor up to 2017/2018 were also reduced drastically over the last two financial years. The ILI for the various distribution systems is also included in the table.

Description	Component	Unit	Record: Prior (Ml/a)					22/23
			17/18	18/19	19/20	20/21	21/22	
Robertson	Treatment Losses	Volume	61.036	71.845	88.127	227.359	105.108	252.518
		Percentage	3.1%	3.1%	3.4%	7.8%	3.8%	9.1%
	NRW	Volume	290.164	397.136	430.639	577.051	496.947	339.332
		Percentage	15.0%	17.8%	17.4%	21.6%	18.6%	13.4%
	Water Losses	Volume	286.285	392.680	425.684	571.699	491.612	334.258
		Percentage	14.8%	17.6%	17.2%	21.4%	18.4%	13.2%
	ILI		1.67	2.24	2.87	3.85	3.36	3.36
McGregor	Treatment Losses	Volume	35.111	16.026	21.413	21.211	17.703	28.223
		Percentage	14.8%	7.0%	8.2%	7.9%	6.1%	9.5%
	NRW	Volume	20.064	12.137	17.880	17.301	4.365	19.681
		Percentage	10.0%	5.7%	7.5%	7.0%	1.6%	7.3%
	Water Losses	Volume	19.661	11.714	17.402	16.804	3.819	19.143
		Percentage	9.8%	5.5%	7.3%	6.8%	1.4%	7.1%
	ILI		1.51	0.95	0.95	0.91	0.80	0.96
Bonnievale	NRW	Volume	252.311	293.140	279.542	349.250	343.819	438.790
		Percentage	18.8%	19.4%	17.2%	19.8%	19.8%	23.0%
	Water Losses	Volume	249.625	290.113	276.290	345.290	340.344	434.979
		Percentage	18.6%	19.2%	17.0%	19.6%	19.6%	22.8%
	ILI		3.50	3.50	4.12	5.16	5.12	4.5
Ashton	Treatment Losses	Volume	252.821	19.392	-10.492	153.067	307.910	-131.954
		Percentage	16.3%	1.3%	-0.7%	8.0%	15.2%	-8.5%
	NRW	Volume	173.500	322.860	273.987	531.568	-382.363	199.741
		Percentage	12.2%	19.7%	15.4%	27.8%	-22.2%	11.9%
	Water Losses	Volume	44.876	140.196	87.068	371.243	-385.800	196.388
		Percentage	3.2%	8.5%	4.9%	19.4%	-22.4%	11.7%
	ILI		2.30	4.24	4.38	8.55	0.8	3.3
Montagu		Volume	220.286	174.056	127.140	204.645	187.704	178.503

Table A5.1: Treatment Losses, NRW and Water Losses for the Various Water Distribution Systems								
Description	Component	Unit	Record: Prior (Ml/a)					22/23
			17/18	18/19	19/20	20/21	21/22	
	Treatment Losses	Percentage	20.6%	14.6%	10.5%	15.8%	14.0%	14.6%
	NRW	Volume	69.272	102.560	76.173	143.294	83.477	72.644
		Percentage	8.1%	10.1%	7.0%	13.1%	7.2%	7.0%
	Water Losses	Volume	65.570	100.530	74.010	141.109	81.163	70.560
		Percentage	7.9%	9.9%	6.8%	12.9%	7.0%	6.8%
	ILI		0.54	0.78	0.73	1.39	0.40	0.8
TOTAL	NRW	Volume	805.311	1 127.833	1 078.221	1 618.464	704.849	1 070 188
		Percentage	14.00%	17.1%	15.0%	21.0%	9.1%	14.4%
	Water Losses	Volume	668.016	935.233	880.454	1 446.575	689.425	1 055 328
		Percentage	11.6%	14.2%	12.2%	18.8%	8.9%	14.2%
	ILI		1.67	2.30	2.58	3.89	1.41	2.58

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 an 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.

Table A.5.2: Reducing Unaccounted Water		
Reducing unaccounted water and water inefficiencies		Assessment Score
Night flow metering	Partially	60%
Day flow metering	Yes	60%
Reticulation leaks	Yes	60%
Illegal connections	Yes	60%
Un-metered connections	Yes	60%
Leak and meter repair programmes. Consumer units targeted by:		
Leak repair assistance programme	Partially	40%
Retro-fitting of water inefficient toilets	Partially	40%
Meter repair programme	Partially	60%
Consumer/end-use demand management: Public Information & Education Programmes		
Schools targeted by education programmes	No	20%
Consumers targeted by public information programmes	Yes	60%

TOPIC 6: WATER RESOURCES

The two tables below give an overview of the current water resources and the potential additional water resources available for the various towns in Langeberg Municipality.

Table A.6.1: Current and Additional Water Sources and Volumes							
Current Water Sources							
Source Type	Scheme	Number of Sources	Current 22/23 Abstraction or Returns (Mm ³ /a)	Licence Volumes (Mm ³ /a)	Community Water Supply		Assessment Score
					Rural	Urban	
Groundwater	-	-	-	-	-	-	-
Surface Water	Robertson	3	2.300	3.264750	0%	100%	60%
	McGregor	1	0.228	1.200000	0%	100%	60%
	Bonnievale	2	1.576	1.245000	0%	100%	60%
	Ashton	3	1.660	2.962528	0%	100%	60%
	Montagu	4	1.189	1.232000	0%	100%	60%
External Sources (Bulk Purchase)	-	-	-	-	-	-	-
Conjunctive use	-	-	-	-	-	-	-
Water Returned to Source	Robertson	1 WWTW	0.976	Busy with WULAs for WWTW	N/A	N/A	60%
	Bonnievale	1 WWTW	0.268		N/A	N/A	60%
	Ashton	1 WWTW	0.328		N/A	N/A	60%
	Montagu	1 WWTW	0.489		N/A	N/A	60%

Table A.6.2: Additional Resources				
Source Type	Schemes	Number of Sources	Potential Volume (Mm ³ /a)	Licensed Abstraction (Mm ³ /a)
Groundwater	Montagu	5	0.232	In Process
Surface Water	-	-	-	-
External Sources (Bulk Purchase)	-	-	-	-

Table A.6.3: Monitoring		
Monitoring		Assessment Score
% of water abstracted monitored: Surface water		60%
% of water abstracted monitored: Ground water		60%
Monitoring		Assessment Score
Surface water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)		60%
Ground water levels (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)		60%
Water quality for formal schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)		80%
Water quality for rudimentary schemes? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)		40%
Borehole abstraction? (1: daily, 2: weekly, 3: monthly, 4: annually, 5: never)		60%

The graph below gives an overview of the annual raw water supply to all the towns.

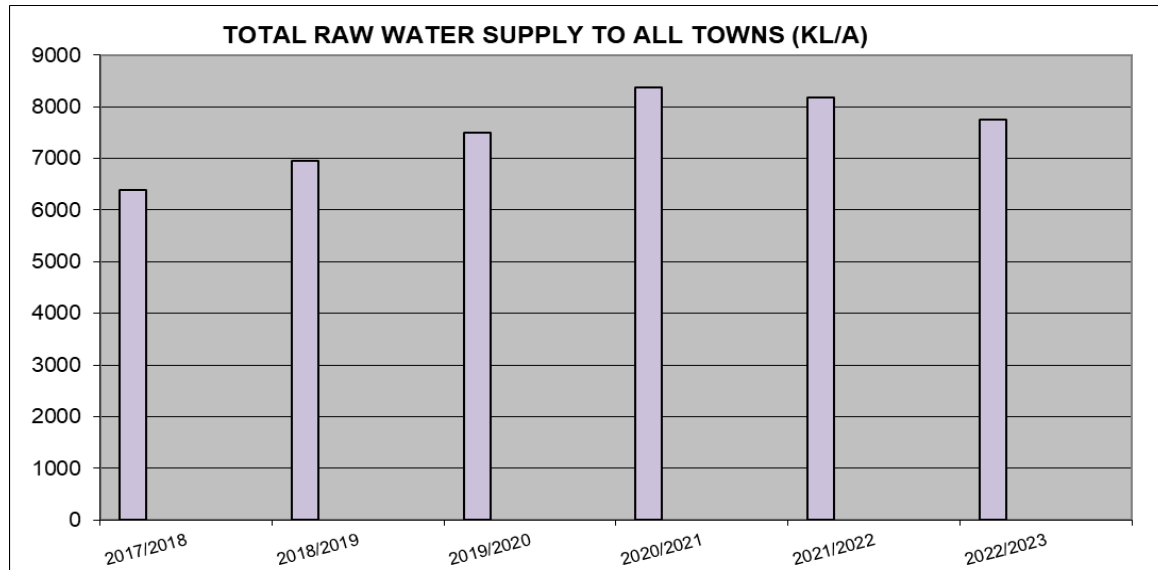


Figure A.6.1: Total Annual Bulk Raw Water Supply to All the Towns

The graph below gives a summary of the total bulk raw water supply to the various towns within Langeberg Municipality's Management Area for the last six financial years.

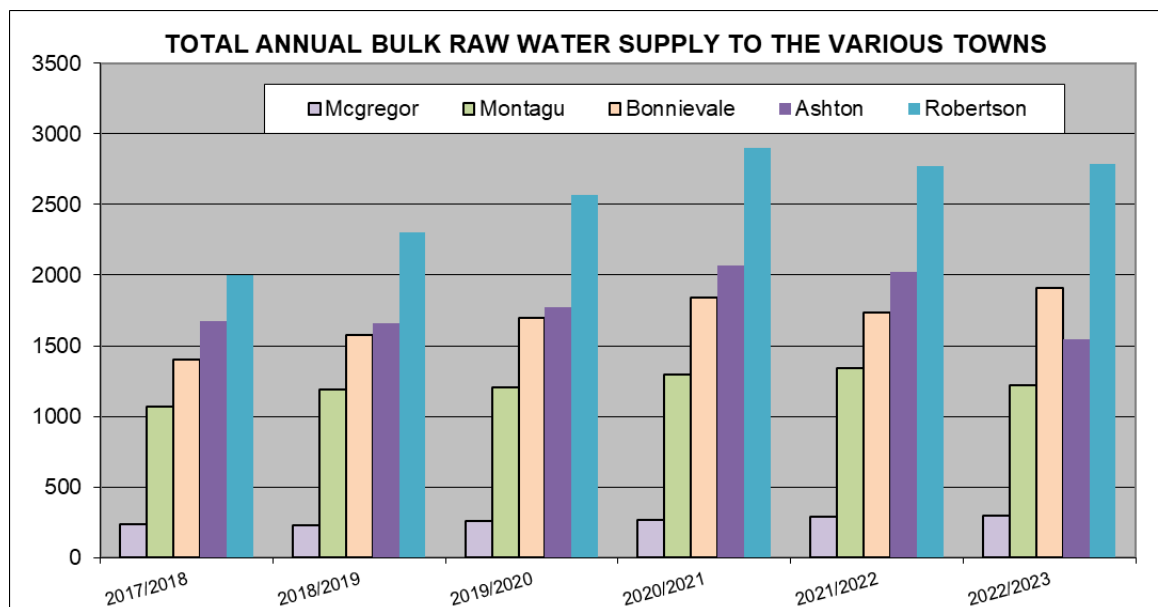


Figure A.6.2: Total Annual Bulk Raw Water Supply to the Various Towns

The table below summarise the bulk raw water supplied to the various towns in Langeberg Municipality's Management Area.

Table A.6.4: Annual Bulk Raw Water Supply to the Various Distribution Systems								
Scheme	Source type	Licensed abstraction (Ml/a)	Record: Prior (Ml/a)					2022/2023
			2016/2017	2017/2018	2018/2019	2019/2020	2021/2022	
Robertson	Brandvlei Irrigation Scheme (Breede River), Dassieshoek and Koos Kok Dams and Hoops River Irrigation Scheme	3 264.750	2 000.600	2 299.700	2 565.500	2 903.500	2 772.359	2 789 500
McGregor	Houtbaais River	1 200.000	236.685	227.655	260.219	269.542	290.552	297 014
Bonnievale *	Breede River and Zanddrift Irrigation Canal	1 245.000	1 399.052	1 576.354	1 693.604	1 838.635	1 737.460	1 905 500
Ashton	Breede River (Montagu Included), Cogmanskloof Irrigation Scheme (CBR) and Robertson Canal (Breede River)	2 962.528	1 672.981	1 660.242	1 772.048	2 066.537	1 990.607	1 544 307
Montagu	Cogmanskloof (From Ashton), Cogmanskloof Irrigation Scheme (CBR), Rietvlei and Kruis River	1 232.000	1 071.388	1 189.136	1 208.756	1 296.985	1 344.756	1 220 497
Total raw water supply to all towns		9 904.278	6 380.706	6 953.087	7 500.127	8 375.199	8.135 734	7 756 818

Note: * Raw water for Bonnievale was estimated from system input volume + 4% treatment losses

The abstraction from all the water sources is monitored by Langeberg Municipality and is a valuable source of information in terms of the IWA water balances for the various schemes.

Water Quality: Langeberg Municipality makes use of an accredited external laboratory to conduct the drinking water compliance sampling and analysis. Samples are taken at various locations for each of the systems and analysed to evaluate the compliance. The water quality results are loaded onto DWS's IRIS via the internet. Once entered the data is automatically compared to SANS241. This real-time system allows for immediate intervention to rectify any problems.

Langeberg Municipality actively implements their Operational and Compliance Water and Effluent Quality Sampling Programmes to promptly identify water and effluent quality failures and to react accordingly.

Table A.6.5: Water Quality			
Water Quality	In place	Status Quo	Assessment Score
Is there a Water Safety Plan in Place?	Yes	80%	80%
Reporting on quality of water taken from source: urban & rural	Yes	60%	60%
Quality of water returned to the resource: urban	Yes	80%	60%
Quality of water returned to the resource: rural	Yes	Not Applicable	80%
Is there a Pollution contingency measures plan in place?	No	60%	60%
Quality of water taken from source: urban - % monitored by WSA self?	Yes	80%	80%
Quality of water taken from source: rural - % monitored by WSA self?	Yes	Not Applicable	80%
Quality of water returned to the source: urban - % monitored by WSA self?	No	80%	80%
Quality of water returned to the source: rural - % monitored by WSA self?	Yes	Not Applicable	80%
Are these results available in electronic format? (Yes/no)	No	80%	80%
% Time (days) within SANS 241 standards per year	Yes	80%	80%
Abstraction IS registered with DWS	Partially	60%	60%
The abstraction IS NOT registered with DWS	-	-	-
The abstraction IS recorded	Yes	60%	60%
The abstraction IS NOT recorded	-	-	-

The additional monitoring required by Langeberg Municipality for determinants identified during the risk assessment exceeding the numerical limits in SANS241:2015 are as follows (Water quality samples taken over the last two financial years).

Table A.6.6: Percentage Compliance of the Water Quality Samples for the Period July 2021 to June 2023						
Performance Indicator	Performance Indicator categorised as unacceptable Yes / No (Table 4 of SANS 241-2:2015)		% Sample Compliance according to SANS 241-2015 Limits		Frequency of Additional Monitoring due to failure (Table 3 of SANS 241-2:2015)	
	21/22	22/23	21/22	22/23	21/22	22/23
Robertson						
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	94.0%	-	-
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	100.0%	99.7%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	93.0%	91.2%	Monthly	-
McGregor						
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	98.3%	-	-
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	98.8%	99.1%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	93.0%	94.4%	Monthly	-
Ashton						
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	93.7%	-	-
Acute Health Microbiological	No (Excellent)	No (Excellent)	98.2%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.4%	99.6%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	93.0%	90.3%	-	-
Montagu						
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	93.6%	-	-
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.5%	100.0%	-	-
Operational Efficiency	No (Excellent)	No (Excellent)	93.0%	96.0%	-	-
Bonnievale						
Acute Health Chemical	No (Excellent)	No (Excellent)	100.0%	96.6%	-	-
Acute Health Microbiological	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Chronic Health	No (Excellent)	No (Excellent)	100.0%	100.0%	-	-
Aesthetic	No (Excellent)	No (Excellent)	99.4%	99.5%	-	-
Operational Efficiency	No (Excellent)	Yes (Unacceptable)	93.0%	87.6%	-	-

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

Table A.6.7: Four 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	Determinant that poses an immediate unacceptable health risk if present at concentration values exceeding the numerical limits specified in this part of SANS 241.
Aesthetic	Determinant 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	Determinant 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	Determinant that is essential for assessing the efficient operation of treatment systems and risks from infrastructure

The table below indicates the compliance of the E.Coli monitoring frequency in the water distribution systems of the Langeberg Municipality, in terms of the minimum requirements of SANS:241. The period assessed was for samples taken from July 2022 to June 2023.

Table A.6.8: Langeberg Municipality's Compliance of the Monthly E.Coli Monitoring Frequency in the Water Distributions Systems in terms of the Minimum Requirements of SANS 241-2:2015 (Table 2).			
Distribution System	Population served	Required number of monthly samples (SANS 241-2:2015: Table 2)	Number of monthly E.Coli samples taken by Municipality during 2022/2023
Robertson	35 034	6.9	6.1
McGregor	3 950	2.0	3.9
Bonnievale	11 493	2.3	4.0
Ashton	16 119	3.2	4.4
Montagu	20 935	4.1	3.9
Total	87 531	17.3	22.3

It can be noted from the above table that the number of monthly E.Coli samples taken by the Municipality during the 2022/2023 financial year for McGregor, Bonnievale and Ashton was adequate, but not for Robertson and Montagu.

Effluent quality: The overall Microbiological, Chemical and Physical compliance percentages of the final effluent samples taken over the last three financial years are included in the tables below.

Table A.6.9: Percentage Microbiological (E.Coli) Compliance of the Compliance Samples taken at the Various WWTWs			
WWTW	2020/2021	2021/2022	2022/2023
Robertson	10.0%	0%	0.0%
McGregor	100.0%	54.5%	0.0%
Ashton	81.8%	33.3%	25.0%
Montagu	90.9%	25.0%	22.7%
Bonnievale	45.5%	16.7%	0.0%
Total	66.7%	25.9%	10.4%

Table A.6.10: Percentage Chemical compliance of the Compliance Samples taken at the Various WWTWs												
WWTW	2020/2021				2021/2022				2022/2023			
	Ammonia	Nitrites & Nitrates	COD Filtered	Overall	Ammonia	Nitrites & Nitrates	COD Filtered	Overall	Ammonia	Nitrites & Nitrates	COD Filtered	Overall
Robertson	0.0%	100.0%	100.0%	65.6%	7.7%	100.0%	0.0%	35.7%	0%	100.0%	3.3%	34.4%
McGregor	N/A	N/A	100.0%	100.0%	0%	100.0%	0.0%	33.3%	0%	100.0%	13.3%	37.8%
Ashton	58.3%	83.3%	90.9%	77.1%	3.8%	100.0%	28.0%	43.9%	0%	100.0%	6.6%	35.5%
Montagu	33.3%	100.0%	100.0%	77.1%	30.8%	100.0%	40.0%	56.9%	0%	100.0%	53.3%	51.1%
Bonnievale	75.0%	100.0%	90.9%	88.6%	30.8%	100.0%	24.0%	51.6%	5%	100.0%	40.0%	48.3%
Total	42.6%	95.7%	96.4%	79.2%	14.6%	100.0%	18.4%	44.3%	5.0%	100.0%	23.3%	42.8%

Table A.6.11 Percentage Physical Compliance of the Compliance Samples taken at the Various WWTWs												
WWTW	2020/2021				2021/2022				2022/2023			
	pH	Electrical Conductivity	Suspended Solids	Overall	pH	Electrical Conductivity	Suspended Solids	Overall	pH	Electrical Conductivity	Suspended Solids	Overall
Robertson	100.0%	72.7%	45.5%	72.7%	100.0%	19.2%	100.0%	73.1%	100.0%	25.0%	10.0%	45.0%
McGregor	100.0%	100.0%	N/A	100.0%	100.0%	83.3%	N/A	91.5%	100.0%	68.4%	N/A	56.1%
Ashton	100.0%	83.3%	91.7%	91.7%	100.0%	15.4%	69.2%	61.5%	100.0%	30.0%	60.0%	63.3%
Montagu	100.0%	91.7%	91.7%	94.4%	96.2%	50.0%	92.3%	79.5%	100.0%	60.0%	100.0%	86.7%
Bonnievale	100.0%	83.3%	91.7%	91.7%	100.0%	46.2%	53.8%	66.7%	100.0%	55.0%	60.0%	71.7%
Total	100.0%	86.4%	80.9%	89.7%	99.2%	42.8%	78.8%	74.5%	100.0%	54.5%	57.5%	70.7%

The trend of the wastewater quality compliance for the various WWTWs are summarised in the table below.

Table A.6.12: Trend of Microbiological, Chemical and Physical Compliance Percentages for the Various WWTWs.									
WWTW	2011/2012 to 2012/2013			2012/2013 to 2016/2017			2016/2017 to 2018/2019		
	Micro.	Chemical	Physical	Micro.	Chemical	Physical	Micro.	Chemical	Physical
Robertson	Increase	Decrease	Decrease	Decrease	Increase	Increase	Same	Increase	Decrease
McGregor	Increase	Increase	Increase	Increase	Increase	Decrease	Same	Same	Increase
Ashton	Increase	Decrease	Same	Increase	Increase	Increase	Decrease	Decrease	Increase
Montagu	Increase	Decrease	Decrease	Decrease	Increase	Decrease	Increase	Increase	Increase
Bonnievale	Increase	Decrease	Decrease	Increase	Increase	Increase	Decrease	Same	Decrease

Industrial Effluent Monitoring: Montagu Foods is the only industrial consumer where the quality of the final effluent discharged from the consumer into the Municipality's sewer system is monitored by the Municipality. Montagu Winery monitors the quality of their final effluent themselves and submit the results to the Municipality. **There is an increase in the organic loads at the Robertson WWTW and the Municipality will start with measures to monitor the quality of effluent discharged by industrial consumers into the municipality's sewer system and industrial consumers will need to pay according to the quality of industrial effluent discharged by them.**

TOPIC 7: FINANCIAL

Capital Budget: The table below gives an overview of Langeberg Municipality's historical water and sewerage capital expenditure over the last six financial years.

Table A.7.1: Historical Capital Expenditure of the Water and Sewerage Infrastructure Budgets						
Infrastructure	17/18	18/19	19/20	20/21	21/22	22/23
Water	R26 473 913	R5 286 534	R1 202 478	R5 634 206	R20 576 028	R15 233 436.67
Sewerage	R235 057	R0	R3 193 823	R189 940	R13 148 100	R20 652 217.91
Total	R26 708 970	R5 286 534	R4 396 301	R5 824 146	R33 724 128	R35 885 654.58

The historical capital expenditure for water and sewerage infrastructure for the period 2022/2023 is R35 million per annum which is higher than the last five financial years which were between R5 million per annum to R33 million per annum.

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

Table A.7.2: Total Operational Costs and Income for Water and Sanitation Services for the Last Six Financial Years						
Description	Record Prior					2022/2023
	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	
Water Services						
Expenditure	R34 782 333-30	R47 163 718-01	R43 217 691-21	R43 438 212-84	R63 616 382.71	R51 239 640.52
Income	-R53 702 455.68	-R52 051 096-39	-R53 262 192-22	-R46 645 307-70	-R80 158 725.27	-R72 321 008.18
Surplus / Deficit	-R18 920 122-38	-R4 887 378-38	-R10 044 501-01	-R3 207 094-86	-R16 542 342.56	-R21 081 367.66
Sanitation Services						
Expenditure	R16 674 471-21	R27 744 776-47	R28 792 677-86	R31 688 088-29	R41 594 371.11	R31 383 851.77
Income	-R32 897 787-97	-R39 021 696-06	-R37 868 694-50	-R54 210 208-47	-R68 949 007.50	-R61 677 770.44
Surplus / Deficit	-R16 223 316-76	-R11 276 919-59	-R9 076 016-64	-R22 522 120-18	-R27 354 636.39	-R30 293 918.67

Source: WSDP Performance- and Water Services Audit Reports

Tariff and Charges: Langeberg Municipality's tariffs support the viability and sustainability of water supply services to the poor through cross-subsidies (where feasible). Free basic water and sanitation services are linked to the Municipality's Indigent Policy and all indigent households therefore receive free basic water and sanitation services. The subsidisation mechanism used for the provision of free basic water is primarily aimed at supporting those who cannot afford to pay, in addition to the provision of subsidies to the indigent.

Langeberg Municipality's current (2022/2023) water and sewer tariffs are based on the following:

- The Municipality started in 2015/2016 with the implementation of a six-block step rising residential watertariff structure with the first 6 kl/month being free for indigent households.
- Water tariffs for commercial and "other" consumers consist of a fix cost per kl consumption with no free water. No step block rising tariff structure is implemented for these consumers.
- The Municipality started in 2016/2017 with new Phase 1, 2 and 3 Drought Condition Water Saving Tariffs for drought periods.
- There is an availability fee for sewage, as well as a fixed sewage charge per month for all consumers, based on the size of their water connections.

Tariffs often comprise both a fixed charge and a variable charge based on consumption. The cost consumers had to pay for their water in Langeberg Municipality's Management Area, for the various years, is presented on the graphs below:

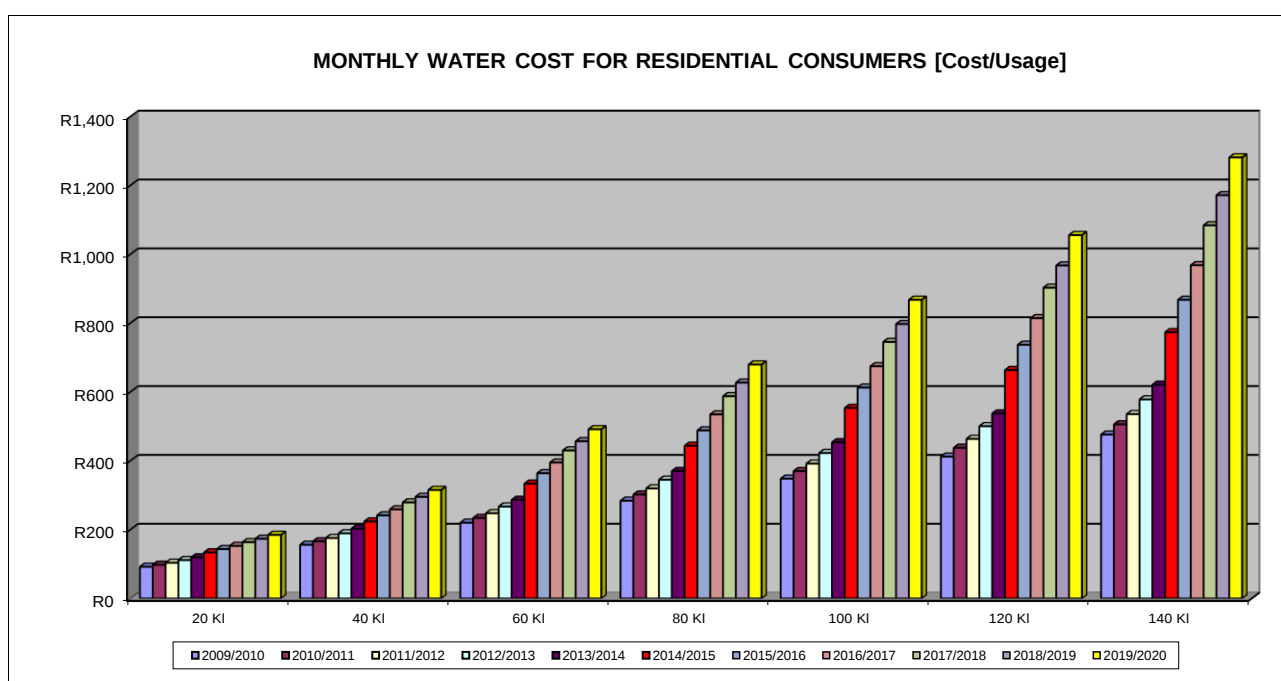


Figure A.7.1: Water Cost for Residential Consumers

The water tariff structures for Langeberg Municipality for the 2022/2023 financial year and the previous four financial years are summarised in the table below (Subject to 15% VAT).

Consumer / Description	Tariff Code	Category	18/19	19/20	20/21	21/22	22/23
Residential (Only properties used exclusively for residential property)	1001	Basic: <= 22mm	R78-59	R84-88	R91-67	R91-67	R 97-17
		0 – 6kl	R2-40	R2-49	R2-58	R2-58	R 2-67
		7 – 15kl	R5-62	R5-91	R6-18	R6-18	R 6-46
		16 – 30kl	R5-92	R6-30	R6-66	R6-66	R 7-04
		31 – 40kl	R6-26	R6-75	R7-20	R7-20	R 7-70
		41 - 60kl	R8-08	R8-82	R9-51	R9-51	R10-28
		>60kl	R8-51	R9-40	R10-24	R10-24	R 11-18
	1010	Basic: > 22 <= 25mm	R123-74	R133-64	R144-33	R144-33	R152-99
		0 – 6kl	R2-40	R2-49	R2-58	R2-58	R2-67
		6 – 15kl	R5-62	R5-91	R6-18	R6-18	R 6-46
		15 – 30kl	R5-92	R6-30	R6-66	R6-66	R7-04
		30 – 40kl	R6-26	R6-75	R7-20	R7-20	R7-70

Table A.7.3: Water tariffs for Langeberg Municipality for the Last Five Financial Years

Consumer / Description	Tariff Code	Category		18/19	19/20	20/21	21/22	22/23
		40 - 60kl		R8-08	R8-82	R9-51	R9-51	R10-28
		>60kl		R8-51	R9-40	R10-24	R10-24	R11-18
	1011	Basic: > 40 <= 50mm		R508-34	R549-01	R592-93	R592-93	R628-50
		0 – 6kl		R2-40	R2-49	R2-58	R2-58	R2-67
		6 – 15kl		R5-62	R5-91	R6-18	R6-18	R6-46
		15 – 30kl		R5-92	R6-30	R6-66	R6-66	R7-04
		30 – 40kl		R6-26	R6-75	R7-20	R7-20	R7-70
		40 - 60kl		R8-08	R8-82	R9-51	R9-51	R10-28
		>60kl		R8-51	R9-40	R10-24	R10-24	R11-18
		1019	Indigent Tariff (Income =< 3000 / month, 100% Subsidised)	Basic	R80-17	R86-58	R93-51	R93-51
	0 – 6kl			Free	Free	Free	Free	Free
	>6kl			R6-09	R6-57	R6-94	R6-94	R7-34
	1704	Informal Housing (100% Subsidised)	Basic	R80-17	R86-58	R93-51	R93-51	R99-12
			0 – 6kl	Free	Free	Free	Free	Free
			> 6kl	R6-09	R6-57	R6-94	R6-94	R7-34
Complexes/development liable for internal services	Basic per unit			90% of Basic Fee				
	Consumption per kl			R5-64	R6-09	R6-57	-	-
	Free water			As per council resolution A 420 of 27/11/2001				
-Group Residential Consumers: One Title	1009	Wst > 32 <= 40mm	Basic Charge	R194-46	R210-02	R226-82	R226-82	R240-43
			0 – 12kl	R2-40	R2-49	R2-58	R2-58	R2-67
			12 – 30kl	R5-62	R5-91	R6-18	R6-18	R6-46
			30 – 60kl	R5-92	R6-30	R6-66	R6-66	R7-04
			60 – 80kl	R6-26	R6-75	R7-20	R7-20	R7-70
			80 – 120kl	R8-08	R8-82	R9-51	R9-51	R10-28
			> 120kl	R8-51	R9-40	R10-24	R10-24	R11-18
	1008	Roodevillas HEV: 100mm	Basic Charge	- R2 082-39	R2 259-78	R2 440-57	R2 440-57	R2 587-00
			0 – 222kl	R2-40	R2-40	R2-49	R2-58	R2-67
			222 – 276kl	R2-40				
			276 - 690kl	R5-62	R5-91	R6-18	R6-18	R6-46
			690 – 1380kl	R5-92	R6-30	R6-66	R6-66	R7-04
			1380 – 1840kl	R6-26	R6-75	R7-20	R7-20	R7-70
			1840 – 2760kl	R8-08	R8-82	R9-51	R9-51	R10-28
	> 2760kl	R8-51	R9-40	R10-24	R10-24	R11-18		
	1007	Jordaan Woonstelle: 40mm	Basic Charge	R335-12	R361-93	R390-88	R390-88	R414-33
			0 – 24kl	R2-40	R2-40	R2-49	R2-58	R2-67
			24 – 54kl	R2-40				
			54 - 135kl	R5-62	R5-91	R6-18	R6-18	R6-46
			135 – 270kl	R5-92	R6-30	R6-66	R6-66	R7-04
			270 – 360kl	R6-26	R6-75	R7-20	R7-20	R7-70
			360 – 540kl	R8-08	R8-82	R9-51	R9-51	R10-28
			> 540kl	R8-51	R9-40	R10-24	R10-24	R11-18
	1006	Cocos Plomosa: 80mm	Basic Charge	R1 228-85	R2 092-39	R2 259-78	R2 440-57	R 2587-00
			0 – 162 kl	R2-40	R2-40	R2-49	R2-58	R2-67
			162 – 405kl	R5-62	R5-62	R5-91	R6-18	R6-46
			405 – 810kl	R5-92	R5-92	R6-30	R6-66	R7-04
			810 – 1080kl	R6-26	R6-26	R6-75	R7-20	R7-70
			1080 – 1620kl	R8-08	R8-08	R8-82	R9-51	R10-28
			> 1620kl	R8-51	R8-51	R9-40	R10-24	R11-18
	1002	Bonniepark HEV: 50mm	Basic Charge	-	R517-14	R558-51	R603-19	R639-38
			0 – 234 kl	R2-41	R2-41	R2-49	R2-58	R2-67
			234 – 585kl	R5-74	R5-91	R6-18	R6-18	R6-46
			585 – 1170kl	R6-09	R6-30	R6-66	R6-66	R7-04
			1170 – 1560kl	R6-47	R6-75	R7-20	R7-20	R7-70
			1560 – 2340kl	R8-39	R8-82	R9-51	R9-51	R10-28
			> 2340kl	R8-88	R9-40	R10-24	R10-24	R11-18
	1003	Silverstrand HEV: 150mm	Basic Charge	R4 831-22	R5 217-71	R5 635-13	R5 635-13	R5 973-24
			0 – 402kl	R2-40	R2-49	R2-58	R2-58	R2-67

Table A.7.3: Water tariffs for Langeberg Municipality for the Last Five Financial Years

Consumer / Description	Tariff Code	Category		18/19	19/20	20/21	21/22	22/23
			402 – 1110kl	R2-40	R5-91	R5-91	R 2-58	R2-67
			1110 – 2775kl	R5-62	R6-30	R6-30	R6-18	R6-46
			2775 – 5550kl	R5-92	R6-30		R6-66	R7-05
			5550 – 7400kl	R6-26	R6-75	R 6-75 R8-82 R9-40	R7-20	R7-70
			7400 – 11100kl	R8-08	R8-82		R9-51	R10-28
			> 11100kl	R8-51	R9-40		R10-24	R11-18
	1004	Avalon Place HEV: 50mm	Basic Charge	R517-14	R558-51	R603-19	R603-19	R639-38
			0 – 180 kl	R2-40	R2-49	R2-58	R2-58	R2-67
			180 - 450kl	R5-62	R5-91	R6-18	R6-18	R6-46
			450 – 900kl	R5-92	R6-30	R6-66	R6-66	R7-04
			900 – 1200kl	R6-26	R6-75	R7-20	R7-20	R7-70
			1200 – 1800kl	R8-08	R8-82	R9-51	R9-51	R10-28
			> 1800kl	R8-51	R9-40	R10-24	R10-24	R11-18
	1005	Kingna- 381289ME	Basic Charge	R335-12	R361-93	R390-88	R390-88	R414-34
			0 – 12kl	R2-41	R2-49	R2-58	R2-58	R2-67
			12 – 24kl	R5-92	R5-91	R6-18	R6-18	R6-46
			24– 30kl	R5-92	R5-91	R6-18	R6-18	R6-46
			30 – 60kl	R5-92	R6-30	R6-66	R6-66	R7-04
			60 – 80kl	R6-26	R6-75	R7-20	R7-20	R7-70
			80 – 120kl	R8-08	R6-30	R9-51	R9-51	R10-28
			> 120kl	R8-51	R6-30	R10-24	R10-24	R11-18
	1012	Water > 25 <= 32mm	> 25 <= 32mm	-	-	-	-	-
			0 - 6 kl	-	-	-	-	-
			> 6 kl	-	-	-	-	-
	1013	Kingna- C/TJK123	Basic Charge	R335-12	R361-93	R390-88	R390-88	R414-34
			0 – 36kl	R2-40	R2-49	R2-58	R2-58	R2-67
			36 – 54kl	R2-40	R2-49	R2-58	R2-58	R2-67
			54 – 135kl	R5-62	R5-91	R6-18	R6-18	R6-46
			135 – 270kl	R5-92	R6-30	R6-66	R6-66	R7-04
			270 – 360kl	R6-26	R6-75	R7-20	R7-20	R7-70
			360 – 540kl	R8-08	R8-82	R9-51	R9-51	R10-28
	> 540kl	R8-51	R9-40	R10-24	R10-24	R11-18		
	1014	Kingna- 828896ME	Basic Charge	R335-12	R361-93	R390-88	R390-88	R414-34
			0 – 66kl	R2-40	R2-67	R2-58	R2-58	R2-67
			66 – 72kl	R5-62	R5-91	R6-18	R6-18	R6-46
			72 – 165kl	R5-62	R5-91	R6-18	R6-18	R6-46
			165 – 300kl	R5-92	R6-30	R6-66	R6-66	R7-04
			300 – 410kl	R6-26	R6-75	R7-20	R7-20	R7-70
			410 – 630kl	R8-08	R8-82	R9-51	R9-51	R10-28
			> 630kl	R8-51	R9-40	R10-24	R10-24	R11-18
	1015	Rosegate HEV 509: 50mm	Basic Charge	R517-74	R558-51	R603-19	R603-19	R639-38
			0 - 6kl	R2-41	R2-30	R2-58	R2-58	R2-67
			6 – 18kl	R2-41	R5-64	R2-58	R2-58	R2-67
			18 – 45kl	R5-62	R5-91	R6-18	R6-18	R6-46
			45 – 90kl	R5-92	R6-30	R6-66	R6-66	R7-04
			90 – 120kl	R6-26	R6-75	R7-20	R7-20	R7-70
			120 – 180kl	R8-08	R8-82	R9-51	R9-51	R10-28
			> 180kl	R8-51	R9-40	R10-24	R10-24	R11-18
	1016	MCG Country Cottages HEV:50mm	Basic Charge	R517-14	R558-51	R603-19	R603-19	R639-38
			0 - 42 kl	R2-41	R2-49	R2-58	R2-58	R2-67
			42 – 105kl	R5-62	R5-91	R6-18	R6-18	R6-46
			105 – 210kl	R5-92	R6-30	R6-66	R6-66	R7-04
			210 – 280kl	R6-26	R6-75	R7-20	R7-20	R7-70
			280 – 420kl	R8-08	R8-82	R9-51	R9-51	R10-28
	> 420kl	R8-51	R9-40	R10-24	R10-24	R11-18		
	1031	Roy McCarthy: 50-80mm	Basic Charge	-	R1 429-36	R1 543-71	R1 543-71	R1 636-36
			0 – 66kl	-	R2-49	R2-58	R2-58	R2-67
			67 – 165kl	-	R5-91	R6-18	R6-18	R6-46

Table A.7.3: Water tariffs for Langeberg Municipality for the Last Five Financial Years								
Consumer / Description	Tariff Code	Category		18/19	19/20	20/21	21/22	22/23
			165 – 300kl	-	R6-30	R6-66	R6-66	R7-04
			301 – 410kl	-	R6-75	R7-20	R7-20	R7-70
			411 – 630kl	-	R8-82	R9-51	R9-51	R10-28
			> 630kl	-	R9-40	R10-24	R10-24	R11-18
	1730	Water bulk contribution levy for HOA per unit – 10%discount			R79-95	R88-34	R93-25	R93-25
Prepaid Meters	3999 Residential	0 - 6 kl		R2-40	R2-51	R2-59	R2-59	R2-67
		7 – 15kl		R5-62	R6-01	R6-28	R6-28	R6-46
		16 – 30kl		R5-92	R6-43		R6-79	R7-04
		31 – 40kl		R6-26	R6-89	R7-35	R7-35	R7-70
		41 – 60kl		R8-08	R9-01		R9-72	R9-72
		> 60kl		R8-51	R9-52	R10-37	R10-37	R11-18
	All other users	Consumption per kl		R7-96	R8-59		R9-07	R9-07
	Public Facilities	1021	Basic		R59-53	R64-30	R69-44	R69-44
Consumption per kl			R4-73	R5-11	R5-34	R5-34	R5-79	
Municipal Departments (General / Sport)	7701	Basic		R79-95	R86-34	R93-25	R93-25	R98-84
	7020	<= 22mm		R80-17	R86-58	R93-51	R93-51	R99-12
	7022	> 22 <= 25mm		R126-24	R136-34	R147-25	R147-25	R156-08
	Consumption > 6 kl per kl			R5-75	R6-21	R6-49	R6-49	R6-79
	7060	Sport	20mm	R71-64	R77-37	R83-56	R83-56	R88-57
	7061	Sport	21 <= 25mm	R114-30	R123-44	R133-31	R133-31	R141-31
	7064	Sport	26 <= 50mm	R465-70	R502-95	R543-19	R543-19	R575-78
	7065	Sport	50 <= 80mm	R1 194-09	R1 289-62	R1 392-79	R1 392-79	R1 476-35
	Consumption per kl			R5-25	R5-67	R5-92	R5-92	R6-19
All other consumers not specified elsewhere	1020	Basic <= 22mm		R79-95	R86-34	R93-25	R93-25	R98-84
	1022	> 22 <= 25mm		R125-89	R135-96	R146-84	R146-84	R155-65
	1023	> 25 <= 32mm		R216-05	R233-34	R252-00	R252-00	R267-12
	1024	> 32 <= 40mm		R335-12	R361-93	R390-88	R390-88	R414-34
	1025	> 40 <= 50mm		R517-14	R558-51	R603-19	R603-19	R639-38
	1026	> 50 <= 80mm		R1 323-48	R1 429-36	R1 543-71	R1 543-71	R1 636-33
	1027	> 80 <= 100mm		R2 092-39	R2 259-78	R2 440-57	R2 440-57	R2587-00
	1028	> 100mm		R4 831-22	R5 217-71	R5635-13	R5635-13	R5973-24
	Consumption per kl			R6-09	R6-57	R6-87	R6-87	R7-25
	1030	Unmetered water 0 >		R79-95	R86-34	R93-25	R93-25	R96-98
Unmetered Water	1701	Monthly basic charge		R79-95	R86-34	R93-25	R93-25	R98-84
	1703	Indigent – Unmetered water (Basic Charge)		R79-95	R86-34	R93-25	R93-25	R98-84
	1704	Informal Settlements – Unmetered water		R79-95	R86-34	R93-25	R93-25	R98-84
Availability Fees	1700	Erven >= 200m²: Excluding properties zoned for agricultural purposes, roads, play parks and parking areas belonging to homeowners' associations and properties which is land locked and cannot be developed.		R79-95	R86-34	R93-25	R93-25	R98-74
Water Saving Tariffs	Moderate Savings	0 – 35kl		-	-	-	-	-
		36 – 50kl		-	-	-	-	-
		51 – 60kl		-	-	-	-	-
		> 60kl		-	-	-	-	-
	Serious Savings	0 – 30kl		-	-	-	-	-
		31 – 40kl		-	-	-	-	-
		41 – 50kl		-	-	-	-	-
Drought Conditions Water Saving Tariffs		> 50kl		-	-	-	-	-
		> 30kl		+50%	+50%	+50%	+50%	+50%
		> 15kl		+100%	+100%	+100%	+100%	+100%
		> 6kl		+200%	+200%	+200%	+200%	+200%
Water Restriction tariff for non-residential consumers		> 30kl		+10%	+10%	+10%	+10%	+10%
		> 15kl		+20%	+20%	+20%	+20%	+20%
		> 6kl		+30%	+30%	+30%	+30%	+30%

Table A.7.3: Water tariffs for Langeberg Municipality for the Last Five Financial Years							
Consumer / Description	Tariff Code	Category	18/19	19/20	20/21	21/22	22/23
Sport grounds and schools	1060	<= 22mm	R71-64	R77-37	R83-56	R83-56	R88-57
	1061	25mm	R114-30	R123-44	R133-31	R133-31	R141-31
	1062	32mm	R194-46	R210-02	R226-82	R226-82	R240-43
	1063	40mm	R301-93	R326-09	R352-18	R352-18	R373-31
	1064	50mm	R465-70	R502-95	R543-19	R543-19	R575-78
	1065	80mm	R1194.09	R1 289-62	R1392.79	R1392.79	R1476.35
	1066	100mm	R1 888-38	R2 039-45	R2202.60	R2202.60	R2334.76
	1067	> 100mm	R4 346-52	R4 694-24	R5069.78	R5069.78	R5 373.97
	Consumption per kl		R5-63	R6-08	R6-36	R6-36	R6-74

A Drought Management Policy is also in place for Langeberg Municipality, which specified measures to be taken when water resources (dams / rivers) drop to certain levels.

The sewer tariff structure for Langeberg Municipality for the 2022/2023 financial year and the previous four financial years are summarised in the table below (Subject to 15% VAT).

Table A.7.4: Sewerage tariffs for Langeberg Municipality for the Last Five Financial Years							
Consumer / Description	Tariff Code	Category	18/19	19/20	20/21	21/22	22/23
<= 20mm Connection	1550	General	R162-06	R175-02	R182-90	R182-90	R193-87
	1564	Indigent Tariff (Income =< 3500 / month) 100% Subsidised	R162-06	R175-02	R182-90	R182-90	R193-87
	1565	Informal Housing	R162-06	R175-02	R182-90	R182-90	R193-87
23 – 50mm Connection	1580	6000 kl water per year or part thereof = 1 unit	R407-70	R440-31	R460-13	R460-13	R484-74
> 50mm Connection	1590	6000 kl water per year or part thereof = 1 unit	R921-13	R994-82	R1 039-59	R1 039-59	R 1101-97
Complexes/development liable for internal services	1570	Basic per unit	90% of Basic Fee				
Abattoir: Abattoir Waste	1595	General (1 – 5 loads)	R1 484-02	R1 602-74	R1 674-87	R1 674-87	R 1775-36
	1599	Conservancy tanker removals more than 5 per month per removal.	R665-26	R718-48	R750-81	R750-81	R795-86
		plus, cost per km	R25-59	R27-64	R28-88	R28-88	R30-61
	5560	Sewage outflow	-	R4 002-07	R4 182-16	R4 182-16	R 4433-09
Availability Fees	1710	Erven >= 200m ² : Excluding properties zoned for agricultural purposes, roads, play parks and parking areas belonging to homeowners' associations and properties which is land locked and cannot be developed.	R162-06	R175-02	R182-90	R182-90	R193-87
Sport Grounds	1598	General	R141-58	R152-91	R159-79	R159-79	R169-38
Business that makes their toilets facilities available to the public		Sewage tariffs are exempted					
Municipal Departments	7550	General <= 20mm Water Connection	R162-06	R175-02	R182-90	R182-90	R193-87
	7580	23-50mm water connection	R405-06	R437-47	R457-15	R457-15	R454-58
	7590	>50mm water connection	R915-19	R988-40	R1 032-88	R1 032-88	R1 094-85
	7598	Sport grounds	R141-58	R152-91	R159-79	R159-79	R169-38

TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER SERVICES

Langeberg Municipality is the WSA and Water Services Provider for the various towns in Langeberg Municipality's Management Area. **The Municipality adopted a performance framework up until the level of supervision. A Performance Management Committee is also in place.**

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.

Finally, the Annual Report, of which the WSDP Performance- and Water Services Audit Report form a part, records the success or otherwise of the previous year's implementation.

The Municipal personnel is continuously exposed to training opportunities, skills development, and capacity building at a technical, operations and management level to create a more efficient overall service to the users. A Workplace Skills Plan is compiled every year and the specific training needs of the personnel, regarding water and wastewater management are determined annually.

The Municipality needs to regularly review their Organogram to ensure that the number of Process Controllers per WTW and WWTW is in-line with DWS's requirements for Process Controllers per Class of plant. Submissions for the re-classification of Process Controllers, after specific training courses were completed, needs to be loaded onto the IRIS.

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 DWS and the sector to provide support that is more effective.

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

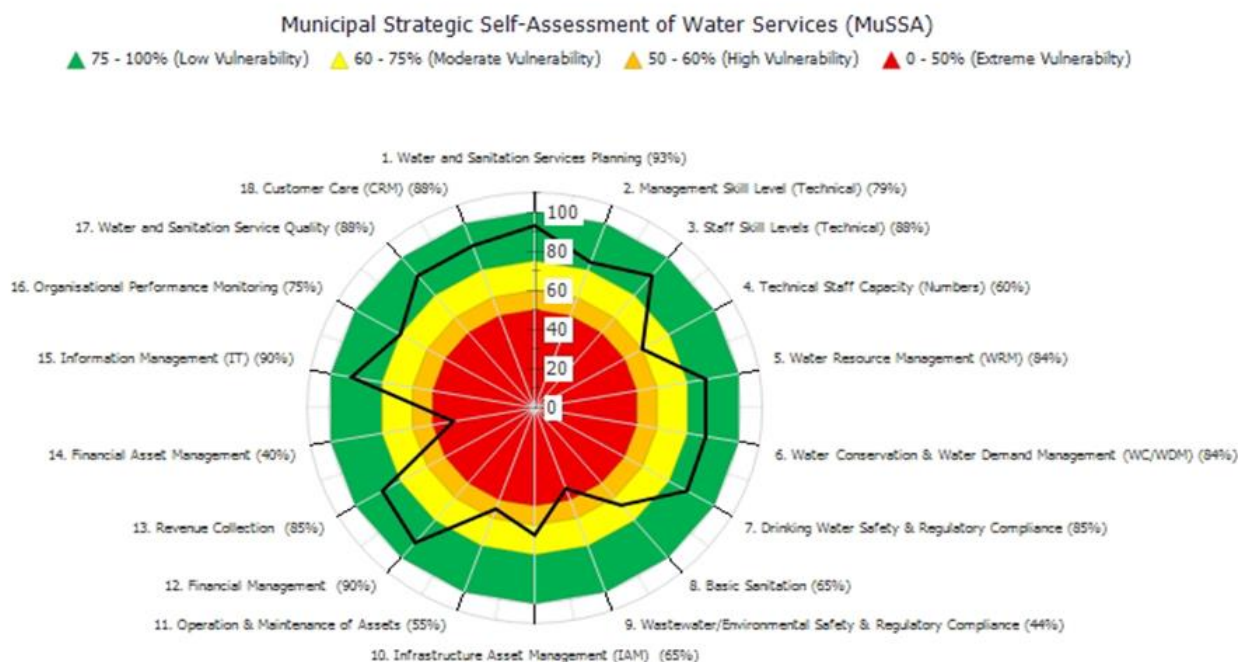


Figure A.8.1: Spider Diagram of the Vulnerability Levels of Langeberg Municipality for 2023

Langeberg Municipality's Vulnerability Index for 2023 was indicated as 0.38 "Moderate Vulnerability". The three areas of concern evident from the 2022 assessment are Financial Asset Management (40.0%, Extreme Vulnerability), Operation & maintenance of Assets (55%, High Vulnerability) and Wastewater/Environmental Safety & Regulatory Compliance (44%, High Vulnerability).

The vacancy rate for the 2019/2020 financial year for Water Services was 10% (72 employees have jobs out of 80 approved positions) and for Sanitation Services it was 16.2% (31 employees have jobs out of 37 approved positions). The highest percentage vacancy rates were for Corporate Services/Other (30.0%) and Strategic Planning and IT (both 28.6%). The table below gives an overview of the staff turnover rate for the various financial years.

Financial Year	Total number of appointments at the beginning of the financial year	Number of terminations during the financial year	% Turn-over Rate
2012/2013	674	49	7.2
2013/2014	691	69	9.9
2014/2015	681	57	8.3
2015/2016	693	48	6.9
2016/2017	709	62	8.7
2017/2018	710	38	5.4
2018/2019	723	47	6.5

Langeberg 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.

A comprehensive Customer Services and Complaints system is in place at Langeberg Municipality and the Municipality has maintained a high and a very consistent level of service to its urban water consumers. After hour emergency requests are being dealt with by the Emergency and Customer Call Centre on a twenty-four-hour basis. Requests are furthermore captured on an electronic mail or works-order system to ensure execution thereof.

The Municipality's Emergency and Customer Call Centre is in operation for more than eight years with four permanent Call Centre Operators operating on a fully functional and effective 24 hour, seven days a week, call answering facility in case of emergencies and to respond to customer queries regarding municipal services across the entire Langeberg Municipal area. The centre deals with general queries regarding municipal services across the entire Langeberg Municipal area. The centre deals with general enquiries, departmental fault reports and complaints from the public including the surrounding farm areas essentially after-hours, on public holidays and over weekends. The functioning of the Call Centre contributes to community liaison and aims to improve on customer loyalty and customer satisfaction within the municipality. In addition to the Call Centre, the Municipal Website (www.langeberg.gov.za) also offers the public to leave comments and complaints.

DWS's Blue Drop Process

The DWS launched the blue and green drop certification, regarding 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 tenth year of existence and promises to be the catalyst for sustainable improvement of South African drinking water quality management in its entirety. The blue drop performance of Langeberg Municipality is summarised as follows in the DWS's 2014 Blue Drop Report (last assessment).

WSDP-IDP WATER SECTOR INPUT REPORT

Table A.8.2: Blue Drop Performance of the Municipality (DWS's 2014 Blue Drop Report)

Municipal Blue Drop Score					72.30%
Regulatory Impression: The Ashton water treatment system is only served by the internal electrical maintenance team which lacks in capacity to adequately execute the required maintenance work. The problem is further exacerbated by the lack of maintenance planning/scheduling created by the absence of maintenance engineers. Although the process controllers mostly comply with Regulation 2834, the WSI is encouraged to provide further training to the team to strengthen operational competency and improve compliance to draft Reg 813. While the Incident Management Protocol is in place, the risk register is lacking despite the WSI having excellent template which is regrettably used merely as a maintenance and repairs logbook. The team should adopt a risk-based approach by developing and implementing a water safety plan for Ashton system. The WSI is commended for subjecting the system to an annual condition assessment, however, the risks identified must be incorporated in the water safety planning process. The non-compliance to SANS 241 with microbiological compliance poses a significant risk for community health in the WSA area of responsibility. The regulator notes the following drinking water quality, which does not meet the SANS 241:2015 drinking water standards. The Institutional Water Quality Compliance as of 29 March 2023 is: The Municipality is encouraged with the continued implementation of initiatives identified in the Water Demand Management Strategy to further reduce non-revenue water. Site Inspection (Ashton WTW score 70%): The Ashton WTW was inspected to verify the Langeberg Local Municipality Blue Drop findings. The site inspection impression at the Ashton WTW was good but is expected to show further improvement once the construction work to upgrade the plant is completed. Failures identified during the site visit are scheduled to be addressed as part of the upgrade.					
Performance Area	Robertson	Ashton	Bonnievale	McGregor	Montagu
Water Services Provider(s)	Langeberg LM	Langeberg LM	Langeberg LM	Langeberg LM	Langeberg LM
Water Safety Planning (35%)	28.18	28.18	28.18	26.60	28.18
Treatment Process Management (8%)	5.44	5.44	5.44	6.44	5.44
DWQ Compliance (30%)	7.13	21.75	15.00	15.00	21.75
Management Accountability (10%)	7.75	8.50	6.25	8.50	7.00
Asset Management (14%)	9.94	9.21	9.21	9.21	9.21
Use Efficiency, Loss Management (3%)	2.40	2.40	2.40	2.40	2.40
Bonus Scores	3.23	2.58	3.52	3.58	2.34
Penalties	0.00	0.00	0.00	0.00	0.00
Blue Drop Score (2023)	Not Assessed	70%	Not Assessed	Not Assessed	Not Assessed
Blue Drop Score (2014)	64.06%	78.05%	69.99%	71.73%	76.31%
Blue Drop Score (2012)	43.31%	48.99%	48.31%	58.26%	65.80%
Blue Drop Score (2011)	29.48%	33.50%	33.50%	48.50%	33.58%
Blue Drop Score (2010)	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
System Design Capacity (Ml/d)	10.1	11.9	3.0	0.6	5.2
Operational Capacity (% i.t.o. Design)	61%	67%	144%	125%	74%
Average daily consumption (l/p/d)	206.2	632.7	482.6	267.7	255.4
Microbiological Compliance (%)	95.2%	97.9%	99.9%	99.9%	99.9%
Chemical Compliance (%)	99.9%	95.2%	91.3%	89.5%	95.2%

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Table A.8.3: DWS's 2014 Blue Drop Risk Ratings for the Various Systems

Municipal Blue Drop Risk Rating					50%
The overall 2014 Risk Rating for Langeberg is 50% which translates into the 10 th worst performance (or position 16 out of 25 WSAs) 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 all 5 systems; Drinking Water Quality in 1 out of the 5 systems; and Risk Management in none of the 5 systems.					
Assessment Area	Robertson	Ashton	Bonnievale	McGregor	Montagu
2014					
Blue Drop Risk Rating (2014)	51.1%	46.5%	55.1%	54.6%	47.9%
Process Control RR	56.1%	53.8%	74.4%	73.0%	56.1%
Drinking Water Quality RR	55.6%	44.4%	40.7%	40.7%	40.7%
Risk Management RR	30.4%	21.7%	21.7%	21.7%	21.7%
2013					
Blue Drop Risk Rating (2013)	50.9%	41.7%	41.7%	56.8%	36.2%
Process Control RR	56.1%	48.7%	48.7%	54.1%	43.9%
Drinking Water Quality RR	44.4%	40.7%	40.7%	70.4%	55.6%
Risk Management RR	100.0%	65.2%	65.2%	73.9%	65.2%
2012					
Blue Drop Risk Rating (2012)	87.8%	79.7%	82.8%	71.0%	81.1%
Process Control RR	80.5%	79.5%	79.5%	81.1%	82.9%
Drinking Water Quality RR	63.0%	48.1%	40.7%	37.0%	11.1%
Risk Management RR	69.6%	78.3%	100.0%	69.6%	78.3%

Green Drop Status: The DWS has finished with the new Green Drop assessment for the WSAs. Green drop status is awarded to those WSAs that comply with 90% criteria on key selected indicators on waste water quality management. The green drop performance of Langeberg Municipality is summarised as follows in the DWS's 2022 Green Drop Report, which was the last complete Green Drop assessment done by the DWS.

Table A.8.4: Green Drop Performance of the Municipality (DWS's 2022 Green Drop Report)					
Average Green Drop Score			2021 – 27%, 2013 – 51.58%, 2011 – 43.0%		
Regulators Comment: Langeberg Local Municipality impressed with a good representation of senior officials, which resonates well in terms of firm management commitment. Regrettably, preparations for the audit were not on par with the Inspectorate expectations, and IRIS uploads or hard copies of evidence were not fully available. The Green Drop Score of 27% places the municipality in the unappealing position of critical performance. The poor performance of the Robertson system contributed significantly to the overall low score. Robertson WWTW is due for upgrade and plans are in place, which is commendable. However, new infrastructure alone will not bring about the desired change – plans, systems and procedures needs to be developed and implemented to ensure the upgraded plant meets compliance and good practice standards. Langeberg follows a long history of average to sub-standard performance, and the 2023 audit cycle will bring a new opportunity to rectify this situation. Municipal leadership will need to pull all stops to ensure that the municipality raise its performance by addressing each of the Green Drop Standards outlined in this report. The Regulator takes a balanced view by observing the low and medium risk CRR positions of 4 of the 5 plants except for Robertson in a high-risk position, notable as result of the reasonable to good effluent quality compliance, with McGregor meeting excellence standards, with Ashton and Bonnievale also doing very well. It is thus evident that the effluent quality is already scoring high on the Regulator's scoresheet, but the administration needs to match this performance. The municipal sub-standard scores thereby does not relate to major root cause failures but is rather one where many small changes will affect a significant improvement in the future Green Drop scores. DWS encourages leadership to focus on these incremental improvements and to target a Green Drop score of >50% in the 2023 audit. Green Drop findings: 1. The Supervisors and majority of Process Controllers are unregistered and do not comply with Reg. 2834 or draft Reg. 813 2. No engineer or scientific competencies could be verified via qualification certificates 3. Electrical maintenance is done inhouse while mechanical maintenance is outsourced - maintenance schedules and logbooks are lacking for all systems. 4. Raw and final monitoring is done by external laboratory, with on-site operational monitoring lacking 5. Financial information was provided, however, lacking ring-fenced budgets, expenditure records, and actual cost determinations with sufficient cost drivers. 6. Flow figures were provided, noting that all flowmeters were either out of order or erroneous for a large part of the year under review. Flow data is not interpreted or used to influence operations and need to be addressed via training and/or appointment of qualified operational/supervisory staff. 7. Plant & Process Audits, Sewer Inspections and Asset Registers are absent from the technical management portfolio of evidence. Daily sewer network inspections are in place, but no proof provided via checklists, photos, or rating systems 8. Most of the treatment plants lacks water use authorisations to guide the frequency, determinants, and associated limits that would render a plant compliant at discharge of effluent. 9. Based on an evaluation against general limits, the plants are predominantly non-compliant, except for the McGregor Ponds which have low (irrigation) limits. 10. Zero of the five (5) systems had capital plans to address the defects identified, most concerning of all is the hydraulic overload of the Robertson WWTWs. However, no evidence of business plans of funding sources could be provided.					
GREEN DROP REPORT CARD					
Key Performance Area	Ashton	Bonnievale	McGregor	Robertson	Montagu
Capacity Management	36	32	15	32	22
Environmental Management	55	55	55	55	55
Financial Management	19	19	23.8	19	19
Effluent Quality Compliance	61	61	88.8	15	61
Technical Management	11	11	5.9	11	11
Local Regulation	100	100	100	100	100
Treatment Capacity	68	88	58	88	55
Asset Management	64	55	64	61	64
Bonus Scores	0	0	0	0	0

WSDP-IDP WATER SECTOR INPUT REPORT

Penalties	0	-25	0	-62.5	0
Disqualifiers	None	None	None	None	None
Green Drop Score (2021)	36%	32%	41%	12%	34%
Green Drop Score (2013)	46.74%	64.71%	69.27%	47.44%	50.08%
Green Drop Score (2011)	40.40%	49.80%	51.40%	36.90%	44.40%
Green Drop Score (2009)	NA (0%)	NA (0%)	NA (0%)	NA (0%)	NA (0%)
System Design Capacity (Ml/d)	3.100	2.500	0.300	4.30	3.50
Capacity Utilisation (% ADWF i.t.o. Design Capacity)	42%	31%	77%	63%	125%
Resource Discharged into	Sarabs river to Cogmanskloof to Breede River	Breede River	Unknown. Irrigation to land	Breede River	Kingna River (Special limits)
Microbiological Compliance	75%	42%	92%	8%	8%
Chemical Compliance	81%	88%	100%	67%	67%
Physical Compliance	92%	92%	100%	67%	67%
Overall Compliance	83%	74%	97.3%	47.3%	47.3%
Wastewater Risk Rating (2012)	52.90%	47.10%	58.80%	64.70%	58.80%
Wastewater Risk Rating (2013)	64.71%	29.41%	35.29%	64.71%	58.82%
Wastewater Risk Rating (2021)	58.8%	52.9%	41.2%	70.6%	47.1%
Site Inspection Score	-	-	-	39%	-

The results for Langeberg Municipality were summarised as follow in DWS's 2022 Green Drop Progress Report.

Table A.8.5: DWS's 2022 Green Drop Risk Profile Progress Report Results for Langeberg Municipality					
Technology Description	Ashton	Bonnievale	McGregor	Montagu	Robertson
Technology (Liquid)	Activated Sludge	Activated Sludge	Aerated ponds/ Oxidation ponds	Activated sludge & BNR	Activated sludge & BNR
Technology (Sludge)	Solar drying beds	Solar drying beds	None specified	None specified	Solar drying beds
Key Risk Areas					
ADWF Design Capacity (Ml/d)	2.430	1.840	0.300	1.800	8.670
Operational flow (% i.t.o. Design Capacity)	87%	53%	56%	108%	33%
Annual Average Effluent Quality Compliance (2012-2013)	55.2%	66.7%	91.7%	47.9%	44.8%
Microbiological Compliance	75.0%	66.7%	91.7%	58.3%	66.7%
Physical Compliance	58.3%	77.8%	91.7%	83.8%	58.3%
Chemical Compliance	47.9%	55.6%	91.7%	18.8%	29.2%
Technical skills (Reg. 813)	Partial	Yes	Yes	Partial	Partial
2014 Wastewater Risk Rating (%CRR/CRR _{max})	82.4%	64.7%	23.5%	88.2%	63.6%
2013 Wastewater Risk Rating (%CRR/CRR _{max})	64.7%	29.4%	35.3%	58.8%	64.7%
Risk Abatement Planning					
Highest Risk Areas based on the CRR	Wastewater quality, technical skills	Wastewater quality	None	Wastewater quality, technical skills, operational capacity	Wastewater quality, technical skills
WW Risk Abatement Status	Framework established	Framework established	Framework established	Framework established	Framework established
Capital & Refurbishment expenditure for Financial Year 2012-2013 (Rand)	None	None	None	None	R10,565m
Description of Projects' Expenditure 2012-2013	None	None	None	None	Upgrade Phase 3 and upgrade of sewer rising main to Nkqubela
Description of Projects' Expenditure 2021-2022	None	None	None	None	None
W ₂ RAP Abatement Document and Status Commentary	W₂RAP presentation date June 2014 described progress to date as well as way forward. Assembled team. Assessed system – documented, flow diagram compiled. Identified risks, rated them (staff had to complete a questionnaire on risks before the meeting). Determined and validated monitoring of control measures. Developed an improvement plan. Defined monitoring of control measures. Still to establish procedures to verify that W₂RAP is effective and will meet health-based targets. Still to prepare management procedures and support programs. Hazards identified for wastewater source, collection, and drainage; primary, secondary, tertiary treatment; sludge treatment; final discharge of treated effluent; sludge disposal. 71 Risks were identified and 6 risks remained high after control measures implemented. One of these is obtaining the wastewater use authorization from DWS.				

Regulatory Impression

Langeberg Municipality dropped their scores for all their wastewater systems during the 2021 Green Drop audit, compared to the 2013 scores. Their Municipal GD score decreased from 51.58% in 2013 to 27% in 2021.

The Regulator is concerned about the overall poor state of wastewater services at the Roberson system and the consequential impact on respective water resources. It is thus required that the WSI submit a detailed corrective action plan within 60 days of publishing of this report. The plan must map the activities, responsible persons, timelines, and expected improvements as outlined in the Regulatory Comment.

The plan will be considered against the Regulatory Comment and recommended for approval by a national regulation committee.

SECTION B: STATE OF WATER SERVICES PLANNING

DWS's new WSDP website was rolled-out to all the WSAs in the Cape Winelands District on the 17th of October 2017. This WSDP is Langeberg Municipality's new WSDP according to DWS's requirements.

Langeberg 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 Langeberg Municipality's Annual Report. The 2022/2023 WSDP Performance- and Water Services Audit Report was submitted to Municipality and DWS for approval.

Langeberg Municipality's Water and Sewer Master Plan process entails the establishment of computer models for the water systems and the sewer systems in Langeberg 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 Langeberg Municipality's water distribution and sewer drainage systems. All forward planning for water and sanitation services and water and sewerage infrastructure is guided by the WSDP and Water and Sewer Master Plans.

The Water Safety Plan and W₂RAP were drafted in March 2014 and July 2014. These reports are currently being updated.

Water Safety Plans are a form of water quality assurance through a comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to consumer. The multiple barrier principle implies that actions are required at all stages in the process of producing and distributing water to protect water quality.

The W₂RAP 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 W₂RAP is used by Langeberg Municipality to manage the identified risks according to its potential impacts on the receiving environment / community / resources.

Detail Technical Process Audits were done in 2014 for all WTWs and WWTWs. The WWTW Process Audits were again updated for 2018/2019.

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

- Water Master Plan, Langeberg Municipality, March 2012, GLS Consulting
- Sewer Master Plan, Langeberg Municipality, March 2012, GLS Consulting

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:

- The intervention required to address the gap;
- The proposed solution to address the gap; and the
- The Future plan / identified project that would meet the requirement.

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.

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

Vision: “To progress and grow from being one of the best municipalities, to be the best municipality”

Mission: “By providing cost effective quality services to the Citizens, exercising good leadership, ensuring accountable governance and maintaining sound financial management”

Langeberg Municipalities Strategic Objectives are summarised in the table below (2022/2023 IDP).

Table C.1: Strategic Objectives	
Strategic Objectives	Predetermined Objectives
SO1 Housing: “Facilitate integrated human settlements and improved living conditions of all households”	- To manage and provide access to affordable and low-cost housing opportunities to all qualifying citizens within the municipal area. - To provide and maintain an acceptable standard of building activity.
SO2 Basic Service Delivery: Provide and maintain infrastructure to provide basic services to all citizens.	- To provide and maintain the structural civil infrastructure of the Municipality. - To provide and maintain the mechanical assets of the Municipality. - To provide and maintain municipal roads and sidewalks. - To provide and maintain storm water systems. - To provide and maintain a waste management service. - To provide and maintain the distribution of water in municipal area. - To provide and maintain sewerage services in the municipal area. - To provide and maintain the continuous supply of basic electricity. - To provide Traffic and Law Enforcement services within the Municipal area. - To provide and maintain Firefighting- and Disaster Management services - To provide and maintain Recreational, Sporting and Community Facilities. - To provide and maintain the Environmental Services and Cemeteries.
SO3 Local Economic Development: Promote an enabling environment for economic growth and decent employment.	- To promote economic development in the municipal area. - To facilitate and develop an entrepreneurial culture and skills development in the municipal area. - To support the growth and development of the tourism sector. - To work with private sector partners to promote economic growth and encourage business investment in the municipal area.
SO4 “A responsive and accountable administration”	- To create and maintain a functional organization that enables optimal performance by developing and retaining a skilled representative workforce. - To manage the municipality to deliver services in terms of the legislative requirements. - To align and review the performance of the municipality in achieving the strategic objectives of council. - To strive towards a clean, corrupt free and well-managed administration. - To contribute towards inter-governmental relationships with all spheres of government.
SO5 Sound Financial Management: Adherence to all laws and regulations applicable to LG	- To procure goods and services timeously to all end user. - To broaden and improve the revenue base of the municipality. - To provide free basic services to qualifying indigent households in municipal area.
SO6 Enhanced stakeholder engagements to promote civic education.	- To establish partnerships with role-players in the social development sector to improve cooperation, integration, and utilisation of resources. - To promote social cohesion within the municipal service area. - To facilitate and strengthen public participation towards deepen democracy.

The Water Sector’s Vision, Goal and Objectives for the NWRS 2, as aligned with the vision of South Africa 2030, are as follows:

- **Vision:** Sustainable, equitable, and secure water for a better life and environment for all.
- **Goal:** Water is efficiently and effectively managed for equitable and sustainable growth and development.
- **Objectives:**
 - Water supports development and the elimination of poverty and inequality;
 - Water contributes to the economy and job creation; and
 - Water is protected, used, developed, conserved, managed, and controlled in an equitable and sustainable manner.

The Breede-Gouritz Catchment Management Agency (BGCMA) was established in 2014 (Government Notice 412, 23 May 2014) by extending the boundary and area of operation of the Breede-Overberg Catchment Management Agency (BOCMA) in terms of Section 80 of the National Water Act, 1998 (Act No.36 of 1998)

The Catchment Management Strategy for the Breede-Gouritz Water Management Area (BGWMA), July 2017, include the following Vision and three Strategic Focus Areas.

“Healthy water resources, for all, forever,”

- **Strategic Area 1: Protecting for People and Nature:** Focusing primarily on management of streamflow, water quality, habitat and riparian zones related to riverine, wetland, estuarine and groundwater resources, to maintain important ecosystem goods and services and biodiversity.
- **Strategic Area 2: Sharing for Equity and Development:** Focusing primarily on management of water use from surface and groundwater resources through the operation of infrastructure, in order to provide water for productive and social purposes within and outside of the WMA.
- **Strategic Area 3: Co-operating for Compliance and Resilience:** Focusing primarily on co-operation and management of institutional aspects to enable and facilitate the protection and sharing of water, including the more co-operative stakeholders, partnerships, information sharing, disaster risk and adaptation elements of the strategy.

TOPIC 1: SETTLEMENTS AND DEMOGRAPHICS

Topic C.1.1: Settlement Demographics and Public Amenities						
Section	Intervention Required	%	Solution description as identified by Master Plan	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
Settlements Summary	No	100.0	Implement proposals for Core Landscape areas, Urban development, Heritage areas and Urban restructuring for the five towns as included in 2015 SDF.	100.0	Partially	92.9
	Yes	100.0	Privately owned land needs to be purchased in Robertson and Ashton to address the growing invasion of land. Communal services are to be provided.	100.0	Partially	92.9
	No	100.0	Continue with the implementation of the SDF and Housing Delivery Plan and ensure that new developments are in line with these priority action plans. Ensure that the provision of bulk water and sewerage infrastructure are aligned with the Water and Sewer Master Plans and that housing projects only continue once the required bulk water and sewerage infrastructure are in place.	100.0	Partially	92.9
Summary by Settlement Group	No	100.0				100.0
Assessment Score by Settlement Type	No	100.0				100.0
Amenities Summary	No	100.0				100.0

Langeberg Municipality's 2015 SDF includes recommendations for core landscape areas, urban development, heritage areas and urban restructuring for each of the towns.

Various informal settlements were established through illegal land occupation, with the growing need to provide basic services to these sites. Privately owned land needs to be purchased in Robertson and Ashton to address the growing invasion of land. The properties earmarked is Heyl property in Robertson and Bruwer farm in Ashton. The challenges experienced with the growing informal settlements, as included in Langeberg Municipality's 2019/2020 IDP, are as follows:

- Growing informal settlements throughout the area.
- No account of the number of shacks per town.
- Illegal land invasion.
- No access to basic services.

- Vandalism of taps and sanitation facilities provided in informal areas.
- Illegal provision of electricity to shacks and or back yard dwellers safety risk.
- Rectification of damaged RDP houses.
- Transfer of Rental Stock pre 1994 stock.
- People that are currently staying in RDP houses where the original beneficiaries have died and they are earning more than R3500 pa.
- Beneficiaries who stay in the informal area do not qualify, because of their income that is above the threshold of R3500.00 a month and the agreement with the McGregor Heritage.
- The temporary relocation area (TRA) in Nkqubela where 505 even are planned for informal structures and there will most probably be an overflow of people which will not be accommodated.
- Transfer of Breaking New Ground (BNG/RDP) stock.
- Beneficiaries' refusal to take ownership because of structural damages to BNG houses.
- Non-availability of suitable land for housing purposes.
- Lack of monitoring land invasion and uncontrolled growth of informal settlements.

The Three-Year Housing Delivery Plan of Langeberg Municipality is indicated in the table below.

Table C.1.2: Langeberg Municipality's Three-Year Housing Delivery Plan										
Project	Program	2019/2020			2020/2021			2021/2022		
		Sites Serviced	Houses Built	Funding R'000	Sites Serviced	Houses Built	Funding R'000	Sites Serviced	Houses Built	Funding R'000
Langeberg		78	226	38 830	397	88	35 260	0	189	25 770
McGregor	IRDP	10	68	9 000						
Robertson Heights	IRDP								189	24 570
ISSP Montagu Mandela Square	UISP			3 000	173		10 380			
ISSP Bonnievale Boekenhoutskloof	UISP			410	224		13 440			
Ashton Bruwer's Land	IRDP									1 200
Robertson Nkqubela erf 136	IRDP		90	11 700		88	11 440			
Bonnievale Uitsig	IRDP	68	68	12 920						
Zandvliet	IRDP									
Strydom Street	IRDP			1 800						

All schools and medical facilities in the urban areas of Langeberg Municipality are provided with a higher level of water and sanitation service (Water connection inside the erven and a waterborne sewer system). **The existing service levels (Water and Sanitation) of the primary schools in the rural areas need to be verified. All schools in the rural areas without basic water and sanitation services need to be provided with at least basic services.**

TOPIC 2: SERVICE LEVELS

Topic C.2.1: Service Levels Profile						
Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
Direct Backlog Water	Yes	100.0	Assist private landowners as far as possible with the provision of basic water services to all the households in the Municipality's Management Area with existing water service levels still below RDP standard, once practical guidelines become available from the DWS.	100.0	Yes	85.71
	Yes	100.0	Provide communal water services to all households in informal areas without basic water services at a ratio of 25 households per 1 communal tap.	100.0	Yes	85.71

Topic C.2.1: Service Levels Profile						
Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
Direct Backlog Sanitation	Yes	100.0	Assist private landowners as far as possible with the provision of basic sanitation services to all the households in the Municipality's Management Area with existing sanitation service levels still below RDP standard, once practical guidelines become available from the DWS.	100.0	Yes	85.71
	Yes	100.0	Provide communal sanitation services to all households in informal areas without basic sanitation services at a ratio of 5 households per 1 communal toilet.	100.0	Yes	85.71
Water Services Infrastructure Supply Level Profile	Yes	100.0	Provide an additional 43 communal taps in informal areas to ensure a ratio of 1:25.	100.0	Yes	85.71
Water Reliability Profile	No	100.0				100.0
Sanitation Service Infrastructure Supply Level Profile	Yes	100.0	Provide an additional 279 toilet facilities in informal areas to ensure a ratio of 1:5.	100.0	Yes	85.71
Sanitation Reliability Profile	No	100.0				100.0
Water Services: Education	Yes	100.0	Confirm the water service levels of the schools in the rural areas. Provide basic water services to the schools if the current water service levels are below RDP standard.	100.0	Yes	85.71
Water Services: Health	No	100.0				100.0
Sanitation Services: Education	Yes	100.0	Confirm the sanitation service levels of the schools in the rural areas. Provide basic sanitation services to the schools if the current sanitation service levels are below RDP standard.	100.0	Yes	85.71
Sanitation Services: Health	No	100.0				100.0
Health and Educational Facilities	No	100.0				100.0

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

The large number of residents in the lowest income groups (living in informal areas) places a major challenge on Langeberg Municipality to provide suitable housing. Langeberg Municipality works towards providing all households in the towns with a water connection inside the erven and connecting all households to a waterborne sanitation system. It is however important to consider the Municipality's capacity (financial and institutional) to operate and maintain complex sewage systems if opting for higher service levels and in particular waterborne sanitation.

The National Norms and Standards for Domestic Water and Sanitation Services, as published in the Government Gazette No.41100 of 8 September 2017, include the following interim water and sanitation services (Communal services for informal areas):

Table C.2.2: Interim Water and Sanitation Services (National Norms and Standards for Domestic Water and Sanitation Services)
Intermittent provision of water at a minimum level of water supply services
- A minimum volume of 1 500 litres of potable water shall be made available to a household per week. - The water provided shall comply with the SANS241 quality standards. - The access/delivery point shall be at a minimum a communal standpipe, or a storage facility in the yard (water container, yard tank, roof tank) of at least a volume of 1 500 litres. - In the case of a communal standpipe, it shall be within a reasonable walking distance of no more than 100m from the farthest household. - In the case of a storage facility in the yard (water container, yard tank, roof tank), it shall be refilled by a water tanker with potable water at least once a week. - The water shall be made available for 52 weeks per year. - All water use and/or supply shall be metered, but not tariffed.

Table C.2.2: Interim Water and Sanitation Services (National Norms and Standards for Domestic Water and Sanitation Services)**Intermittent provision of water at a minimum level of water supply services**

- Maintenance of the infrastructure for this level of service is the responsibility of the WSA.
- Point-of-use water treatment systems and methods shall be advocated.
- Efforts shall be made to ensure user acceptance and understanding for this level of service.
- Users shall be educated in effective water use and hygiene.
- This level of service shall be phased out by 2030 to comply with the National Development Plan's requirement of providing a basic service of at least a yard connection for water.

Interim sanitation services (Communal and shared facilities)

- Users shall be consulted on the siting and design, and the responsible cleaning and maintenance of shared toilets. Clean toilets are more likely to be frequently used.
- Plumbing in and for communal and shared facilities needs to be more robust than that installed on private premises, and shall comply with the general principles of the National Building Regulations. Precautions need to be taken in the design against vandalism, theft, and misuse.
- Efforts shall be made to provide people living with chronic illnesses, such as HIV and AIDS, with easy access to a toilet as they frequently suffer from chronic diarrhea and reduced mobility.
- Where possible, communal, and shared toilets must be provided with lighting, or users provided with torches. The input of the users must be sought regarding ways of enhancing the safety of users.
- Efforts to build a sense of communal ownership and pride of possession shall be made so that cooperation is voluntarily given or assured by peer pressure.
- Sufficient sanitation facilities shall be provided for the number of users
 - Communal toilet: Toilet seats – 1 seat per 50 users; Urinal units – 1 unit per 100 users; Hand washing – 1 basin per 10 toilet seats.
 - Shared toilet mostly used all the time: Toilet seats – 1 seat per 20 users; Urinal units – 1 unit per 50 users; Hand washing – 1 basin per 4 toilet seats.
- Shared and communal facilities shall have separate toilet blocks for men and women with separate entries; waste bins with lids in toilet block for women – emptied once a week and disposed of appropriately; urinal facilities for men; seats for children in the section for women; waiting / circulating area; separate washing cubicles for men and women; facility to store large volumes of water (water-borne sanitation); appropriate wastewater disposal system; and store room for keeping the cleaning material / equipment.

All the formal households in the urban areas of Langeberg Municipality's Management Area are provided with water and sewer connections inside the erven. Standpipes and communal ablution facilities are provided in the informal areas as a temporary emergency service.

Communal standpipes represent probably the weakest part of a network's water supply services. 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 do not pay for water. Poor people are the ones that suffer the most from water-related diseases due to:

- Poor quality and maintenance of standpipes and their surroundings. Standpipes are often leaking and poor drainage around standpipes results in standing pools of water and muddy soil.
- Standpipes are not protected and animals lick the taps.
- When people must walk long distances to fetch water, it is used sparingly and not enough water is used for hygiene.
- Even if water is clean when it leaves the standpipe tap, it is often contaminated by dirty containers used for carrying and storage.

Langeberg Municipality is committed to support the private landowners as far as possible regarding addressing the basic water and sanitation services backlog that might still exist on the farms in the rural areas. Water Service Levels in the WSDP for the farms are based on the 2011 Census data.

Langeberg Municipality is faced with various challenges regarding the provision of services on private owned land in a financial sustainable manner (enabling the on-going 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 coordinated manner and must be properly managed and adequately funded if free basic sanitation is to become a reality. This requires close collaboration between the EHPs of the Cape Winelands District Municipality responsible for environmental health and Langeberg Municipality.
- Subsidising the operating and maintenance costs. If the basic service is to be provided free to the poor then Langeberg Municipality must ensure that the costs of providing the service are covered by the local government equitable share and / or through cross-subsidies within Langeberg Municipality's Management Area.

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

Public Amenities Education: All the schools in Langeberg Municipality's urban areas also have adequate and safe water supply and sanitation services. **The water and sanitation service levels of the schools in the rural areas however need to be verified.** Langeberg Municipality is committed to work with the Education Department to address any possible shortcomings that might still exist regarding the provision of water and sanitation services at any of the primary schools in the rural areas.

It is important for the schools to focus on Water Demand Management activities and for Langeberg Municipality to support the schools with a WDM programme. This will not only aid in Langeberg Municipality's demand management initiative directly by reducing the water consumption, but the education of learners at a young age regarding wise water use is a key component for sustainable supply in the long term.

Public Amenities Health: All the clinics and hospitals in Langeberg Municipality's Management Area have adequate and safe water supply and sanitation services. Langeberg Municipality will strive to continue to ensure that the minimum required SANS241:2015 water quality standards are met through the systematic upgrading of their WTWs. The monitoring of provision of basic minimum services to farm dwellers remains a challenge, in view of the limited funding and human resources.

The establishment and functioning of effective health systems and health care services is critical for not only the upliftment of communities but more so for the sustainability of communities. Health services are rendered throughout the area by a network of clinics. The environmental health function is currently with the Cape Winelands District Municipality.

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

It is important that a co-operative relationship exist between the Cape Winelands District Municipality and Langeberg Municipality regarding environmental health issues and that a good communication protocol is followed between the District Municipality and Langeberg Municipality to report on health issues.

The most vulnerable groups within Langeberg 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;
- nobody 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

Damp and sometimes unsanitary conditions present in informal settlements provide an ideal breeding environment for bacteria. Some of the challenges WSAs phase in the informal settlements include the following:

- It is difficult to supply toilets to the dense informal settlements.
- Grey water pollution.
- Grey water run-off from standpipes.

Langeberg 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.

TOPIC 3: WATER SERVICES ASSET MANAGEMENT

Table C.3.1: Water Services Asset Management						
Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
General Information	Yes	100.0	Update the Asset Register to include all the water and sewerage infrastructure assets. CRC, DRC, RUL, Age and Condition of the assets need to be included.	100.0	Yes	92.9
	Yes	100.0	Develop an Asset Management Plan	100.0	Yes	92.9
Operation	Yes	100.0	Implement recommendations from the Water Safety Plan and WTW Process Audits. Improvement/Upgrade plans to be implemented.	100.0	Yes	92.9
	Yes	100.0	Implement recommendations from the W2RAP and WWTW Process Audits. Improvement / Upgrade plans to be implemented.	100.0	Yes	92.9
Functionality Observation	Yes	100.0	Provide additional reservoir storage capacity for the towns with inadequate storage capacity. Upgrade existing water pump stations and provide new water pump stations for the identified areas. Upgrade existing WTWs and WWTWs as recommended. Upgrade existing sewer pump stations and provide new sewer pump stations for the identified areas.	100.0	Yes	92.9
Asset Assessment Spectrum	Yes	100.0	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 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.	100.0	Yes	92.9
Water and Sanitation schemes	No	100.0	Upgrade sections of the water reticulation network and sewer drainage network as proposed in the Water and Sewer Master Plan	100.0	Yes	92.9

Asset Management Plan: Langeberg Municipality's current Asset Register is not adequate for the information required for the WSDP. All the existing water and sewerage infrastructure assets and the CRC, DRC, RUL, Age and Condition grading of the assets need to be included in the Asset Register. The risk category for each of the assets can also be included (Significant, High, Moderate or Low).

It is essential for any service delivery organisation to compile an Asset Management Plan (AMP) to ensure efficient, effective, and optimal management, operation, and maintenance of all assets, which includes treatment plants, reservoirs, structures, buildings, pipelines, sites, etc. The purpose of the AMP is to:

- Ensure the operation and maintenance functions are well planned.
- Demonstrate responsible management.
- Justify and communicate funding requirements.
- Service provisioning complies with regulatory requirements.

An AMP normally includes the following:

- documents the nature, extent, age, utilisation, condition, performance, and value of the infrastructure work;
- identifies existing and target levels of service, as well as expected changes in demand;
- identifies the life-cycle management needs of the infrastructure (development, renewal, operations, and maintenance);
- assesses capital and operational budget needs; and
- identifies infrastructure asset management improvement needs.

Langeberg 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.

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.

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

Priority should be given to rehabilitating existing infrastructure as this generally makes best use of financial resources and can achieve an increased (operational) services level coverage 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.

It is essential for Langeberg Municipality to protect their assets by ensuring that an appropriate maintenance and rehabilitation plan (AMP) is developed and implemented. This plan must be based on the principle of preventative maintenance to ensure that, as far as this is practical, damage to assets is prevented before it occurs. Langeberg 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.

Some of the key challenges of Langeberg Municipality are to identify adequate funds for the rehabilitation and maintenance of their existing infrastructure, which is critical to ensure the sustainability of the services that are provided by the Municipality. It is important for the Municipality to secure adequate funding for major refurbishment and maintenance work, the provision of bulk infrastructure and development of additional sources for Montagu, Ashton, and Robertson to keep up with the high demand for services.

Disaster Management Plan: The main purpose of the updated the Disaster Management Plan for 2019/2020 is to increase the capacity of Langeberg municipality to prevent and deal with disaster. This plan, thus, seeks to achieve the following key outcomes:

- Integration of Disaster Risk Management into the strategic and operational planning and project implementation of all line functions and role players within the municipality;
- Integration of Disaster Management Mitigation strategies and projects within the plan;
- Submission of the Disaster Management Plan to the relevant Governmental structures, such as the Disaster Management Control Centres of Cape Winelands District Municipality, the Western Cape Province, and the National Disaster Management Disaster Control Centre;
- An integrated, fast, and efficient response to emergencies and disasters by all role-players.

Untreated Effluent Management Plan: There are no known untreated effluent discharged to the environment. The W₂RAP includes Management Procedures and Incident Response and Emergency Protocols.

Future Water and Sewerage Infrastructure Requirements:

GROUNDWATER INFRASTRUCTURE

Langeberg Municipality is currently busy with the testing of several boreholes in Montagu for augmentation of the existing surface water sources of the town. There are no groundwater resources for any of the other four towns in Langeberg Municipality's Management Area.

It will therefore be critical for Langeberg Municipality to monitor monthly (at least) the static water level (i.e., the level prior to commencement of pumping for the day) in each of their production and monitoring boreholes for Montagu. Water quality samples also need to be taken on a seasonal or yearly basis. The daily rainfall for the area should also be recorded. This monitoring data should be processed, analysed and reported on by an experienced hydrogeologist in order to ascertain whether the resource is being sustainably utilised or whether groundwater mining is taking place. Managing groundwater for water supply purposes should have the following three main functions:

- Ensure that the aquifer is used optimally: The aquifer should not be over-pumped as that would negatively impact on its long-term sustainable yield or on the environment. It also means that if the aquifer is being under-utilised, this will become known.
- Ensure that the water quality in the aquifer is not negatively affected: This may be as a result of high abstraction from the aquifer, or from poor groundwater protection (from latrines, animal enclosures, etc.).
- Optimise borehole pumping rates so that the pumping equipment operates efficiently: Pumping rates are frequently set too high and this cause unnecessarily high pumping heads, a waste of energy, and at times, pump failure.

An additional function, which is usually captured in the first two points, is to ensure that environmental integrity is maintained. It is important for Langeberg Municipality to focus on aquifer protection, groundwater monitoring and wellfield management, to meet the town's future water requirements. The table below gives an overview of the key groundwater management functions to be implemented in the future.

Activity	Responsible Person	Skills and qualifications required	Resources, tools, and equipment	Remarks
Measuring and recording of water levels.	Pump operator	Literacy, numeracy, trained in taking water levels	Dip meter, ruler, log book, pen.	Done as part of operators' regular O&M activities.
Measuring and recording abstraction	Pump operator	Literacy, numeracy, trained in reading water meters.	Log book, pen	Done as part of operators' regular O&M activities.
Providing data to the authority that is responsible for water	Pump operator and pump operator supervisor	Literacy, numeracy, keeping records.	Postal service or public transport.	Including as part of the reporting requirements of the pump operator.

Table C.3.2: Key Groundwater Management Functions				
Activity	Responsible Person	Skills and qualifications required	Resources, tools and equipment	Remarks
supply on a regular basis.				
Taking water samples	The authority that is responsible for water supply.	Trained in taking water samples, driving license.	Transport, sample bottles, cooler box.	Sampling routine defined by sampling plan.
Sending water samples for testing.	The authority that is responsible for water supply.	Keeping records.	Transport to laboratory	Sent to nearest accredited laboratory.
Defining the monitoring requirements of an individual borehole.	Technical manager of operations or hydrogeologist.	Hydrogeological degree or diploma, experience of hydrogeological conditions.	Reports and records on borehole, monitoring data.	
Ensuring that boreholes are equipped with piezometer tubes for measuring water levels and water meters for measuring abstraction.	The authority that is responsible for water supply.	Project management	In house technical staff, suppliers, contractors, specifications.	
Ensuring that operators have the equipment and skills to do monitoring.	The authority that is responsible for water supply.	Project management	Trainers, suppliers, specifications.	
Monitoring the pump operator's competence to collect and record data.	Pump operator supervisor	Staff supervision, knowledge of pump operators' tasks.	Transport	Done as part of the supervision of O&M activities.
Processing data collected at the local level	Data clerk	Data capture, record keeping, filing, trained in operating software.	Computer, spreadsheet or groundwater management software, files.	Maintains an electronic and physical record of data.
Studying water level, water quality and abstraction data on a regular basis.	Technical manager of operations.	Technical training, operations experience.	Project files, monitoring data	Done as part of the management of O&M
Revising pumping recommendations, and adjusting the monitoring requirements. Ensuring the recommendations are carried out and monitoring the implementation of the recommendations.	Technical manager with hydrogeologist as required.	Technical training, operations experience.	Reports and records on borehole, monitoring data, operational information.	Ongoing management of operations and groundwater resources.
Reporting to council and pump operator, providing summary data to the CMA.	Data clerk with supervision from technical manager.	Training in operating software.	Computer, spreadsheet or groundwater management software, printer.	Summary data defined by license (frequency, what data, form of data)

SURFACE WATER INFRASTRUCTURE

The table below gives an overview of the current raw water storage capacity available, the current water requirements of the towns and the number of days for which storage is available.

Table C.3.3: Current Raw Water Storage Capacity Available, the Current Water Requirements of the Towns and Number of Days for which Storage is Available.								
Scheme	Dam	Raw water storage capacity available (Ml)	Raw water usage for the last three years (AADD, Ml/d)			Number of days for which storage capacity is available		
			16/17	17/18	18/19	16/17	17/18	18/19
Robertson	Dassieshoek Dam	835	7.225	5.481	6.301	138	182	158
	Koos Kok Dam	103						
	Gamgrove Dam	60 (Est)						
McGregor	Vaal Dam	250	1.002	0.648	0.624	250	386	401
	Rooi Dam							

Table C.3.3: Current Raw Water Storage Capacity Available, the Current Water Requirements of the Towns and Number of Days for which Storage is Available.								
Scheme	Dam	Raw water storage capacity available (Ml)	Raw water usage for the last three years (AADD, Ml/d)			Number of days for which storage capacity is available		
			16/17	17/18	18/19	16/17	17/18	18/19
	Nuwe Dam							
Bonnievale	-	-				-	-	-
Ashton	Ground Dam	160	6.590	4.584	4.549	24	35	35
Montagu	Upper and Lower Dam	200 (Est)	4.888	2.935	3.258	41	68	61

It can be noted from the previous table that Bonnievale is the only town with no raw water storage capacity available and Ashton and Montagu are the towns with the least number of days for which raw water storage capacity is available.

BULK WATER PIPELINE INFRASTRUCTURE

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

- **Robertson:** The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. One of the two 250mm dia. feeders from Reservoir 1 supplying to the central town area needs to be upgraded. The existing 75mm dia. feeder main from the Reservoir 1 network to the Nkqubela booster PS needs to be upgraded.
- **McGregor:** A new reservoir and a new booster pump station for the higher lying areas in McGregor were constructed and no further upgrades to the bulk water supply system are therefore required in the nearby future.
- **Bonnievale:** The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A new 315mm dia. dedicated rising main is necessary between the old and new reservoirs. The existing 200mm dia. rising main to the new reservoir can be utilized as an additional supply to the old reservoir when the existing supply to the old reservoir nears capacity.
- **Ashton:** The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. One of the 200mm dia. feeding mains from the WTW to the Langeberg Factory needs to be upgraded to a 315mm dia. main.
- **Montagu:** The existing bulk water supply system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. The existing 200mm dia. rising main from the WTW to the Ashbury Upper reservoir will need to be upgraded. A new 160mm dia. feeder main is required for the proposed Badshoogte reservoir.

The estimated costs for the future bulk water pipelines required are indicated in the table below.

Table C.3.4: Cost of Future Bulk Water Supply Pipelines Required					
Scheme	New feeder mains that are proposed or existing feeder mains that require upgrading in the future	Year	Diameter (mm)	Length (m)	Estimated Cost (VAT Excl.)
Robertson	Included under water reticulation infrastructure	-	-	-	-
McGregor	-	-	-	-	-
Bonnievale	New dedicated rising main to new reservoir (LBW.B4)	2022	315	515	R1 088 514
Ashton	Included under water reticulation infrastructure	-	-	-	-
Montagu	Parallel reinforcement of main pipe. When supply reaches capacity (LMW.B04a)	2026	315	2 445	R4 943 946
	Parallel reinforcement of main pipe. When supply reaches capacity (LMW.B04b)	2026	315	2 010	R4 073 580
	Supply to new Badshoogte reservoir (LMW.B06)	2023	160	545	R476 364

Table C.3.4: Cost of Future Bulk Water Supply Pipelines Required					
Scheme	New feeder mains that are proposed or existing feeder mains that require upgrading in the future	Year	Diameter (mm)	Length (m)	Estimated Cost (VAT Excl.)
	Valve to close (LMW.B08c)	2023	110	-	-
	Valve to close (LMW.B08d)	2023	75	-	-
	40 l/s Flow Control Valve to install	2027	200	-	R273 798
	Valve to open	2027	200	-	-
Total					R10 856 202

WATER TREATMENT WORKS INFRASTRUCTURE

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

Table C.3.5: Existing Capacities and Flows at Each of the WTWs (Ml/d)					
WTW	Existing Hydraulic Capacity	Peak Month Average Daily Flow (2022/2023)	Average Daily Flow (2022/2023)	Required Treatment Capacity (1.5 x AADD _{10yr})	2022/2023 Water Quality Failures (SANS0214:2015)
Robertson	10.140	7.642 (Jun 23)	7.642	13.383	Turbidity (Operational)
McGregor	0.600	0.850 (Nov 22)	0.814	1.403	Turbidity (Operational)
Bonnievale	5.000	5.221 (Jun 23)	5.221	9.517	Turbidity (Operational & Aesthetic)
Ashton	11.910	4.685 (Nov 22)	4.231	8.242	Turbidity (Operational)
Montagu	5.180	3.821 (Dec 22)	3.343	5.882	Turbidity (Operational)

Robertson WTW: The plant is operating below capacity and no immediate extensions to the capacity are required for the short term. The works is generally in good condition with only a few minor items that require attention. The water produced by the WTW generally complies with the required standards, except in the case of aluminium and turbidity for which some samples analysed during the last calendar year (2022/2023) exceeded the allowable limits.

McGregor WTW: The capacity of the WTW is inadequate for the current supply. The capacity of the WTW can be increased with the supply of additional filter units. There is also some refurbishment work required in order ensuring maximum functionality of the existing infrastructure.

Bonnievale WTW: The capacity of the WTW was recently upgraded from 3.040 Ml/d to 5.000 Ml/d. Six new pressure sand filters were added and a new PS was constructed at the WTW site to pump the final water to the new 3.5 Ml reservoir. The capacity of the WTW will need to be increased further in the short to medium term.

Ashton WTW: The plant is currently operating below its design capacity and mostly complies with the water quality standard limits. No upgrades are required in the short to medium term. The Municipality is currently busy with various refurbishment work at the WTW.

Montagu WTW: The plant is currently operating below its design capacity and mostly complies with the water quality standard limits. The capacity of the WTW however needs to be increased for the short to medium term. Additional filter units need to be installed.

The WTWs to be upgraded in Langeberg Municipality are summarised in the table below:

Table C.3.6: WTWs to be Upgraded in the Future		
WTW	Short, Medium, Long Term	Estimated Cost (Vat Excluded)
Upgrade Robertson WTW	Long	R17 500 000
Upgrade McGregor WTW	Short	R6 500 000
Upgrade Bonnievale WTW	Medium	R17 500 000
Upgrade Ashton WTW	Long	R17 500 000
Upgrade Montagu WTW	Medium	R6 500 000
Total		R65 500 000

Key issues to be addressed at the WTWs, as identified through the WSDP inspection process, are as follows:

- Robertson WTW: One of the Ultra-floc dosing pumps is not working. The bulk water meter for the supply from the Hoops River is not working. One of the Soda-Ash mixers is not working. A standby carbon dosing pump is required. Additional grids are required to cover the flocculation channels.
- McGregor WTW: Existing WTW building require attention (Holes in the walls, paint work and damp proofing), as well as the raw water PS building. Landscaping and paving of the areas around the WTW building and process units will ensure neater work area and easy access.
- Bonnievale WTW: 80mm Dia. backwash water meter is not working. Two raw water meters reset after power failures. All required Process Control books (Water Quality, Dosing, Attendance Register) are not available on site.
- Montagu WTW: The valve on the first limestone stabilisation tank is broken. The floor of filter No.4 is broken and the filter is currently not in use. The floors of filters No.1 and 2 are probably also broken according to the Process Controller.

The table below gives an overview of the recommendations for the refurbishment and the O&M activities that need to be addressed at the WTWs.

Table C.3.7: Recommendations for the Refurbishment of the WTWs and the O&M Activities that Need to be Addressed at the WTWs.		
WTW	Recommendations	Estimated Cost (Vat Excluded)
Robertson	Repair Ultra-floc dosing pump and Soda-Ash mixer. Provide standby carbon dosing pump and additional grids for the flocculation channels. Repair bulk water meter for supply from Hoops River.	R195 000
McGregor	Refurbish WTW building and the raw water PS building. Landscaping and paving of the areas around the WTW building and process units.	R240 000
Bonnievale	Install bulk water meters to ensure all filtered backwash water is metered. Ensure bulk raw water meters do not reset after power failures.	R20 000
Montagu	Repair broken filter floors	R200 000
Total		R655 000

WATER PUMP STATIONS

Key issues to be addressed at the water pump stations, as identified through the WSDP inspection process, are as follows:

- Robertson Brandvlei Canal raw water PS: Continuous leak from sump into PS. No security gate for PS building.
- Robertson Reservoir 1 PS (Pump to Reservoir 2): One of the motors is not working.
- Montagu Ashbury to Badshoogte PS: One of the pumps is leaking.
- Montagu Kanonkop Booster PS: One of the pumps is not connected to the pipework.

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

Table C.3.8: Future Water Pump Stations Required					
Scheme	Recommendations included in the Water Master Plan	Year	Capacity (l/s)	Head (m)	Cost (Vat Excluded)
Robertson	Upgrade Reservoir 1 to town PS to 200l/s @ 27m (Add 3 rd pump set) (Was implemented)	-	-	-	-
	Upgrade reservoir 2 – 3 pumps to 40l/s @ 40m, when supply problems occur.	2022	40	40	R28 938
	Upgrade Reservoir 1 to Reservoir 2 PS to 100 l/s @ 45m, when supply problems occur	2024	100	45	R794 682
	New reservoir 4 booster PS at 4 l/s @ 26m (Was implemented)	-	-	-	-
	Sub Total				R823 620

Table C.3.8: Future Water Pump Stations Required					
Scheme	Recommendations included in the Water Master Plan	Year	Capacity (l/s)	Head (m)	Cost (Vat Excluded)
McGregor	None	-	-	-	-
Bonnievale	PS at Old reservoirs site to supply water from old reservoirs to the new reservoir (Was implemented at WTW)	-	-	-	-
Ashton	Add 3 rd pump set for standby at Langeberg PS. Required as emergency supply to Langeberg and Ashton Foods. Install pump only 58 l/s @ 78m	2021	58	78	R923 790
	Upgrade WTW to Cogmanskloof reservoir PS to 135 l/s @ 72m	2022	135	72	R1 413 510
	Downsize the Cogmanskloof to Conradiedorp PS to 65 l/s @ 30m	2026	65	30	-
	Upgrade Zolani pump station to 45 l/s @ 80m	2029	45	80	R552 048
	Sub Total				R2 889 348
Montagu	Add 2 nd pump set for stand-by at WTW – South reservoir PS. Install pump only 19l/s @ 81m	2022	19	81	R382 872
	Add 3 rd pump set for stand-by at WTW – George Brink reservoir PS. Install pump only 22l/s @ 51m	2022	22	51	R302 736
	Upgrade WTW – Ashbury Upper reservoir PS to 105l/s @ 115m	2026	105	115	R3 463 656
	New upper Ashbury PS for 23l/s @ 17m	2023	23	17	R926 016
	Upgrade Montagu West PS to 18 l/s @ 55m, when existing PS reaches capacity.	2035	18	55	R242 634
	Sub Total				R5 317 914
Total					R9 030 882

RESERVOIR INFRASTRUCTURE

Key issues to be addressed at the reservoirs, as identified through the WSDP inspection process, are as follows:

- Robertson Nkqubela reservoirs: Electric fence on top of security fence was vandalised. Cover of 0.700 MI reservoir is not locked and air vents are not covered. Bulk flow meter on outlet of 0.700 MI reservoir was vandalised and is not working.
- Robertson Reservoir No.1: Valve chamber under water, valves are not working and air valve was stolen.
- Robertson Reservoir No.2: Valves are not working and cover is not locked.
- McGregor 0.510 MI Reservoir: Reservoir is leaking and currently not in use.
- McGregor 2.000 MI Reservoir: Cover not locked.
- McGregor 0.450 MI Reservoir: Cover not locked and air vents not covered.
- Bonnievale 0.750 MI Reservoir: It seems as if there is regular overflow at the reservoir. Parts of top barbed razor wire were stolen.
- Bonnievale 2.500 MI Reservoir: Security fence was stolen and vandalised.
- Ashton Cogmanskloof Reservoirs: Covers not locked and air vents not covered.
- Montagu South Reservoir: Cover not locked.
- Montagu West two 0.150 MI Reservoirs: Not fenced and covers not locked.
- Montagu two 0.100 MI Kanonkop Reservoirs: Not fenced.
- Montagu 2.000 MI Ashbury Upper Reservoir: Fence was vandalized and gate stolen. Cover not locked.
- Montagu 0.200 MI Badshoogte Reservoir: Not fenced and cover not locked.
- Montagu 0.020 MI Quisana Reservoir: Reservoir is leaking.

The condition of most of the reservoirs in Langeberg Municipality's Management Area is good and the reservoirs are well maintained. New security fences were also recently installed around some of the reservoirs to reduce possible vandalism. Langeberg Municipality's overall storage factors of the reservoirs for the various towns for 2018/2019, based on 1 x PDD (24 hours storage capacity), are 1.34 for Robertson, 1.34 for McGregor, 1.01 for Bonnievale, 0.58 for Ashton and 1.44 for Montagu.

Even though the town's overall storage capacity might be adequate there might be some distribution zones within the town's network with inadequate storage capacity, as identified through the Water Master Planning process (March 2012) and indicated in the table below (Years and Costs were adjusted).

Table C.3.9: Future Reservoir Storage Capacities Required				
Scheme	Recommendations included in the Water Master Plan	Year	Capacity (MI)	Cost (Vat Excluded)
Robertson	A new reservoir at the existing Reservoir 3 site, when additional storage capacity is required in the Reservoir 2 and 3 zones.	2022	3.000	R9 750 000
	A new reservoir at the existing Reservoir 4 site, when additional storage capacity is required in the Reservoir 4 zone (Was implemented) .	-	-	-
	New reservoir to supply additional storage to the Reservoir 1 zone. Proposed on the hillside to the west of the existing town. This reservoir will act as a balancing reservoir which will feed the larger reservoir zone under peak demands.	2030	5.000	R14 023 800
	Sub Total			R23 773 800
McGregor	-	-	-	-
Bonnievale	New reservoir at the existing old reservoirs site (Was implemented at different location) .	-	-	-
	New reservoir at the existing 2.5MI reservoir site when additional storage is required in the new reservoir zone when future development areas B06 – B09 are develop.	2022	4.000	R12 109 440
	Sub Total			R12 109 440
Ashton	New reservoir at the existing Cogmanskloof reservoir site to augment reservoir storage for Langeberg and Ashton Foods.	2022	10.500	R24 307 920
	New reservoir for Zolani at the existing Zolani reservoir site.	2024	2.000	R7 434 840
	New reservoir for Conradiedorp at the existing Conradiedorp reservoir site.	2026	1.000	R4 696 860
	Sub Total			R36 439 620
Montagu	New reservoir is proposed at the existing Badshoogte balancing tank site.	2023	2.000	R7 434 840
	New reservoir at the Ashbury Upper reservoir site for emergency storage purposes in the lower lying George Brink and Ashbury Lower zones.	2026	3.500	R10 987 536
	Sub Total			R18 422 376
Total				R90 745 236

WATER RETICULATION INFRASTRUCTURE

The Water Master Plan (March 2012) has indicated that based on the most likely land-use development scenario, it will be necessary for the following water reticulation infrastructure (Years and Costs were adjusted):

Table C.3.10: Future Water Reticulation Infrastructure Required			
Scheme	Recommendations included in the Water Master Plan	Year	Estimated Cost (VAT Excl.)
Robertson	Improve supply to Reservoir 1 zone (PRJ-LRW-001)	2020	R4 465 356
	Reservoir 1 additional storage (PRJ-LRW-002)	2031	R1 059 576
	Reservoir 1 zone network upgrades and rezoning (PRJ-LRW-003)	2021-2027	R7 755 384
	Reservoir 2 zone network upgrades and rezoning (PRJ-LRW-005)	2025-2031	R558 726
	Development related infrastructure: Reservoir 2 zone (PRJ-LRW-006)	2023	R1 522 584
	Reservoir 3 zone network upgrades and rezoning (PRJ-LRW-008)	2025-2033	R511 980
	Reservoir 4 storage & implementation of booster zone (PRJ-LRW-009)	2024	R253 764
	Development related infrastructure: Reservoir 4 zone (PRJ-LRW-010)	2023-2026	R1 335 600
	Sub Total		R17 462 970
McGregor	Implement new booster pump zone (PRJ-LMcW-001) (Was implemented)	-	-
	McGregor network upgrades (PRJ-LMcW-002)	2022-2023	R2 762 466
	Development related infrastructure: McGregor (PRJ-LMcW-003)	2023-2028	R598 794
	Sub Total		R3 361 260
Bonnievale	Old reservoirs zone network upgrades (PRJ-LBW-003)	2023-2026	R4 133 682

Table C.3.10: Future Water Reticulation Infrastructure Required

Scheme	Recommendations included in the Water Master Plan	Year	Estimated Cost (VAT Excl.)
	New reservoir zone network upgrades (PRJ-LBW-004)	2023	R431 844
	Implement new PRV zone (PRJ-LBW-005)	2025	R244 860
	Development related infrastructure: New reservoir zone (PRJ-LBW-006)	2024-2026	R2 622 228
	Sub Total		R7 432 614
Ashton	Improve supply to Langeberg & Ashton Foods (Pty) Ltd (PRJ-LAW-002)	2021-2022	R5 925 612
	Cogmanskloof network upgrades and rezoning (PRJ-LAW-003)	2023	R329 448
	Development related infrastructure: Cogmanskloof zone (PRJ-LAW-004)	2022-2031	R638 862
	Conradiedorp network upgrades and rezoning (PRJ-LAW-006)	2023-2026	R527 562
	Development related infrastructure: Conradiedorp zone (PRJ-LAW-007)	2027-2028	R2 101 344
	Zolani network upgrades (PRJ-LAW-009)	2025	R411 810
	Development related infrastructure: Zolani zone (PRJ-LAW-010)	2030	R463 008
	Sub Total		R10 397 646
Montagu	Ashbury Upper zone network upgrades and rezoning (PRJ-LMW-003)	2020-2026	R3 559 374
	Ashbury Lower zone network upgrades and rezoning (PRJ-LMW-004)	2032-2035	R1 754 088
	Development related infrastructure: Ashbury Upper zone (PRJ-LMW-005)	2032	R213 696
	New Badshoogte reservoir and related upgrades (PRJ-LMW-006)	2025	R362 838
	George Brink zone network upgrades (PRJ-LMW-007)	2025-2028	R2 829 246
	Kanonkop zone network upgrades (PRJ-LMW-008)	2022	R540 918
	Kanonkop booster zone network upgrades (PRJ-LMW-009)	2022	R209 244
	Development related infrastructure: South zone (PRJ-LMW-010)	2031	R990 570
	West zone network upgrades (PRJ-LMW-011)	2035	R721 224
	Sub Total		R11 181 198
Total			R49 835 688

BULK SEWER PIPELINE AND SEWER DRAINAGE NETWORK INFRASTRUCTURE

Based on the most likely land-use development scenario, it will be necessary for the following bulk sewer pipeline and sewer drainage network infrastructure.

Table C.3.11: Future Bulk Sewer Pipeline and Sewer Drainage Network Infrastructure Required

Drainage Network	Project No.	Year	Estimated Cost (VAT Excl.)
Robertson	Gravity catchment network upgrades (PRJ-LRS-001)	2028-2034	R4 266 606
	Robertson PS catchment network upgrades (PRJ-LRS-002)	2020-2024	R425 325
	Verification of unknown system information (PRJ-LRS-003)	2020	R2 385
	Development related infrastructure (PRJ-LRS-004)	2022-2027	R2 290 713
	Sub Total		R6 985 029
McGregor	Service existing unserved erven (PRJ-LMcS-001)	2022-2026	R11 072 442
	McGregor catchment network upgrades (PRJ-LMcS-002)	2030	R1 383 300
	Development related infrastructure: McGregor (PRJ-LMcS-003)	2031	R117 024
	Sub Total		R12 572 766
Bonnievale	PS No.3 catchment network upgrades (PRJ-LBS-001)	2030-2032	R5 776 152
	PS No.2 catchment network upgrades (PRJ-LBS-002)	2021	R1 531 011
	PS No.6 catchment network upgrades (PRJ-LBS-003)	2020-2022	R1 196 316
	PS No.4 catchment network upgrades (PRJ-LBS-004)	2023	R3 395 445
	Investigate system at Parmalat (PRJ-LBS-005)	2023	R195 888
	Service existing unserved erven (PRJ-LBS-006)	2032	R10 521 348
	Development related infrastructure: PS No.6 catchment (PRJ-LBS-008)	2022-2030	R3 214 503
	Sub Total		R25 830 663
Ashton	Ashton PS catchment network upgrades (PRJ-LAS-001)	2026-2028	R9 743 043
	Development related items: Ashton PS catchment (PRJ-LAS-002)	2021-2034	R2 484 693
	Ashton gravity catchment network upgrades (PRJ-LAS-003)	2022	R1 203 471

Table C.3.11: Future Bulk Sewer Pipeline and Sewer Drainage Network Infrastructure Required			
Drainage Network	Project No.	Year	Estimated Cost (VAT Excl.)
	Survey & capture network information (PRJ-LAS-004)	2020	R156 933
	Development related items for FDA A07 (PRJ-LAS-005)	2032	R453 468
	Sub Total		R14 041 608
Montagu	Montagu PS No.1 catchment network upgrades (PRJ-LMS-001)	2023-2030	R7 199 043
	Montagu PS No.2 catchment network upgrades (PRJ-LMS-002)	2029-2031	R2 254 779
	Development related infrastructure: Montagu PS1 catchment (PRJ-LMS-003)	2021	R3 642 690
	Development related infrastructure: Montagu PS1 catchment (PRJ-LMS-004)	2022-2035	R946 368
	Abandon pumping station and divert flow to new collector sewer (PRJ-LMS-005)	2021-2022	R494 331
	Avalon Springs PS catchment network upgrades (PRJ-LMS-006)	2025	R742 848
	Sub Total		R15 280 059
Total			R74 710 125

SEWER PUMP STATIONS

Key issues to be addressed at the sewer pump stations, as identified through the WSDP inspection process, are as follows:

- Robertson Sport field sewer PS: No standby pump.
- Bonnievale Sewer PS No.6: Fence vandalised.
- Ashton Main Sewer PS: Only two of the four pumps are working.

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

Table C.3.12: Future Sewer Pump Stations Required				
Scheme	Recommendations included in the Sewer Master Plan	Year	Capacity (l/s)	Cost
Robertson	Investigate capacity of existing Sport field PS	2021	-	R22 737
	Investigate capacity of existing Asazani PS	2021	-	R22 737
	Investigate capacity of existing Silverstrand PSs	2021	-	R22 737
	Upgrade existing Nestle PS to 27 l/s (Investigate first)	2024	27	R263 622
	Sub Total			R331 833
McGregor	New 5 l/s PS for FDA Mc01	2031	5	R544 098
Bonnievale	Investigate capacity of existing PS No.7	2021	-	R22 737
	Upgrade existing PS No.2 (Investigate first)	2021	-	R625 983
	Upgrade existing PS No.1 (Investigate first)	2021	-	R566 835
	Investigate capacity of existing Abattoir PS	2021	-	R22 737
	Upgrade existing PS No.5 (Investigate first)	2021	-	R566 835
	Upgrade existing PS No.6 to 50 l/s	2022	50	R307 506
	Upgrade existing PS No.4 to 40 l/s	2023	40	R235 797
	Upgrade existing PS No.3 to 105 l/s	2030	105	R537 261
	New 5 l/s PS (Was implemented)	-	-	-
	Sub Total			R2 885 691
Ashton	Investigate capacity of existing Unipack PS	2021	-	R22 737
	Upgrade existing Ashton PS to 78 l/s	2027	78	R372 060
	New 5 l/s PS when FDA A07 develops	2032	5	R544 098
	Sub Total			R938 895
Montagu	Abandon existing Ashbury PS	2022	-	R227 847
	Upgrade existing Avalon Springs PS to 14 l/s (Investigate first)	2025	14	R195 570
	Upgrade existing Montagu PS (M1) to 120 l/s	2030	120	R600 702
	Upgrade existing Montagu PS (M2) to 41 l/s	2031	41	R307 506
	Sub Total			R1 331 625
Total				R6 032 142

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:

- The Ashton pumping station and rising main should be upgraded in the future when capacity problems occur. A new pumping station and rising main is proposed for a future development area.
- The Bonnievale No.3 and No.6 pumping stations and rising mains should be upgraded in the future when capacity problems occur.
- A new pumping station and rising main is proposed for a future development area in McGregor.
- The Montagu No.1 and No.2 pumping stations and rising mains should be upgraded in the future when capacity problems occur. It is proposed that the Ashbury pumping station is decommissioned and the flow from the Ashbury drainage area is diverted to the Montagu 1 drainage.
- The Robertson pumping station should be upgraded in the future when capacity problems occur.
- The duty points of the pump stations (and diameters of the rising mains) need to 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.

WASTE WATER TREATMENT INFRASTRUCTURE

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

WWTW	Existing Hydraulic Capacity	Peak Month Average Daily Flow (2022/2023)	Average Daily Flow (2022/2023)	Average Wet Weather Flow (2 months)	Final Effluent Compliance for 2022/2023
Robertson	4.300	6.144 (Jan 22)	4.899	6.016	Microbiological: 0.0% Chemical: 40.4% Physical: 50.0% <i>General Limits</i>
McGregor	0.300	0.313 (Jun 22)	0.257	0.292	Microbiological: 0.0% Chemical: 16.1% Physical: 11.5% <i>Irrigation Limits</i>
Bonnievale	1.800	1.546 (Nov 21)	1.27	1.461	Microbiological: 0.0% Chemical: 35.1% Physical: 62.5% <i>General Limits</i>
Ashton	2.450	1.16 (Dec 22)	1.784	2.286	Microbiological: 25.0% Chemical: 35.1% Physical: 62.5% <i>General Limits</i>
Montagu	3.500	2.484 (Jul 22)	2.016	2.376	Microbiological: 22.7% Chemical: 64.3% Physical: 79.2% <i>General Limits</i>

Langeberg Municipality revises on an annual basis the capacity and suitability of the WWTWs to meet the requirements of the authorisations and downstream users 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, then the Municipality appoints reputed consulting engineering firms to undertake feasibility studies to perform technical and economical evaluation of the different options available for upgrading or extending the capacity of the treatment works.

Robertson WWTW: The WWTW do not have sufficient capacity to treat the existing high organic load flow to the works. The original design organic loading at the time of the previous upgrade (2003) was based on a COD of 725 mg COD/l. The raw water quality has since then worsened to 1 200 mg COD/l (2017/2018), which is almost double which was allowed for in the previous design. This deterioration in raw water quality results in the works now being organically overloaded should the flow rate exceed 2.6 Ml/d. It is proposed that the Municipality continue with the upgrading of the works as soon as possible. The “Technical Report for possible extensions and alterations to the Robertson WWTW,” March 2019, recommended the construction and/or rehabilitation of the following process units.

- New inlet works: New automated inlet works is proposed with a design capacity of 7.7 M/d, in order to take future long-term expansion into consideration. The inlet works should consist of inlet channel, 2 x mechanical screens, screenings compactor / washer, hand-raked screen, grit removal in two concrete vortex tanks with a paddle stirrers and air lift pumps, grit classifier, modified parshall flume and ultrasonic open channel flow meter.
- MLE Biological Reactor (BR2): Construction of a new MLE biological reactor to treat 3.5 Ml/d average flow. Provision should be made for a future module in setting of the new reactor. The new reactor should allow for an anoxic basin, aeration basin, A-recycle pumps, and tilting weir to adjust levels in the aeration basin.
- New Secondary Sedimentation Tank (SST2): A new 22.5m dia., centre fed and sloped-bottom secondary clarifier is proposed. The combined average flow of the existing SST1 and the proposed SST2 will be 7.7 Ml/d.
- New Chlorination Contact Tank (CCT), allowing for a min. 30-minute contact time, to be provided.
- New Sludge Silo: A new sludge silo to store dewatered sludge to be provided. The silo should have sufficient volume to store dewatered sludge produced at the works, at the design future flow of 7.7 Ml/d. The setting of the silo should make provision for a future silo unit.
- New Mechanical Dewatering Unit: A new mechanical dewatering unit, with a capacity of no less than 68 m³/h at 4500 mg/l solids of feed sludge, is proposed. The existing drying beds can be used to dry digested sludge from the Bio-filters and as backup to the mechanical dewatering facilities.

McGregor WWTW: The WWTW has sufficient capacity to treat the existing flow to the works, but an upgrade will be required within the next 10 years to meet the future required flow.

Bonnievale WWTW: The WWTW has sufficient capacity to treat the current and future flow to the works for the short to medium term. An upgrade will only be required in the long term (>10 years).

Ashton WWTW: The WWTW has sufficient capacity to treat the existing flow to the works, but an upgrade will be required within the next 10 years to meet the future required flow.

Montagu WWTW: The WWTW was recently upgraded from a capacity of 1.8 Ml/d to 3.5 Ml/d and the plant has sufficient capacity to treat the current and future flow for the short to medium term. An upgrade will only be required in the long term (>10 years).

The table below gives an overview of the recommendations for the WWTWs in Langeberg Municipality's Management Area, as taken from the WWTW Process Audits (2018/2019):

Table C.3.14: Recommendations for the various WWTWs, as included in the WWTW Process Audits (2018/2019)	
WWTW	Recommendations
Robertson	• Investigate the origin of the influent containing high conductivities. • Replace mechanical screen. • Ensure that the sluices are closed properly to improve cleaning of grit channels. • A dedicated drying area for screenings should be considered. • Replace floodlights to reduce vandalism and theft of bins and wheelbarrows. • Keep calibration certificates on site. • Repair the outlet flow meter. • The flow division between the conventional plant and aeration system should be monitored. It appears to be 50:50.

Table C.3.14: Recommendations for the various WWTWs, as included in the WWTW Process Audits (2018/2019)

WWTW	Recommendations
	- Repair the scum box. - The biofilter effluent should be sampled monthly to evaluate process performance. - Ensure all ports are cleaned daily. - Samples from the humus tanks should be drawn monthly in order to evaluate process performance. - Maintain the pH in the digester at 7.00. - Replace the missing manhole covers as this is a safety hazard. - Install two additional 30 kW aerators. - Calibrate Dissolved Oxygen meters. - Install ladder to access Dissolved Oxygen meters. - Excess sludge should be wasted regularly in order to control the MLSS concentration in the range 4000-6000 mg TSS/l. - The Process Controller should monitor the sludge settleability daily and maintain the recommended mixed liquor suspended solids concentration. - To successfully maintain a viable biological population and to maintain the proper concentration of solids, the system requires continuous observation and monitoring by the Process Controller. - Sludge return rate from the clarifier should be increased, when necessary. - Remove weeds from pond banks. - The ponds should be emptied and cleaned out. - Install scale for gas bottle to be mounted on so that monitoring of available gas can be facilitated. - Repair gas leak detector. - Ensure 0.25 mg/l Free Chlorine in the final effluent. - Ensure that the correct testing parameter templates are updated on the IRIS to ensure that compliance percentages are correct. - The following daily operational tests should be conducted: - pH's of all process units should be tested - Outlet flow meter readings should be recorded daily. - pH Meter to be calibrated. - A Class V Supervisor should be available. - A fire extinguisher should be available on site and serviced annually. - Emergency eyewash basin should be made available. - Railings around humus tanks and primary settling tanks should be built. - Safety Representative should be available on site. - Enable alarm system at the store room. - Cover all manholes with covers. - Replace filter in breathing apparatus. - Repair broken fence to ensure safety of the wastewater treatment works. - Repair lights at intake works.
McGregor	- Screenings should be removed at more frequent intervals. - Measure and record the sludge levels weekly in the septic tank. - If sludge levels exceed 1 metre at the outlet end of the septic tank, desludging is required. - Install an inflow meter and an outflow meter and record flow meter readings daily. This is a requirement by DWS. - Remove all reeds and weeds from ponds. - Chlorine floaters should be implemented to assist with disinfection. - Ensure that the correct testing parameter templates are updated on IRIS to ensure that compliance percentages are correct. - Record all quantities of screenings being removed. - Register staff with DWS. - A Class I Process Controller and Class V Supervisor should be available. - A sign board should be erected at the gates indicating "no swimming." - Life jackets or floating aids should be kept on site.
Bonnievale	- The flow meter should be calibrated and the Calibration Certificate should be displayed. - Investigate the origin of the high Conductivities in the influent. - Measure conductivities on site daily. - The inflow meter should be calibrated annually and a Calibration Certificate should be available at the works. - Install outflow meter and record readings daily. This is a requirement from DWS. - Excess sludge should be wasted regularly in order to control the MLSS concentration in the range 4000-6000 mg TSS/l. - The Process Operator should monitor the sludge settleability daily and maintain a constant mixed liquor suspended solids concentration. - A generator should be installed as a backup power supply. - A sludge wastage programme should be implemented in order to control the solid content in the reactor. - Sludge should not be stockpiled on site. Sludge should be removed regularly. - Clean out excessive reeds from banks of ponds. - Clean out the chlorine contact tank at regular intervals. - Always ensure 0.25 mg/l Free Chlorine in the final effluent.

Table C.3.14: Recommendations for the various WWTWs, as included in the WWTW Process Audits (2018/2019)

WWTW	Recommendations
	- Ensure that the correct testing parameter templates are updated on IRIS to ensure that compliance percentages are correct. - pH Should be monitored daily. - All staff should be registered with DWS. - Repair gas leak detector. - Implement eye wash shower.
Ashton	- Investigate the origin of the influent containing high conductivities. - The inlet flow meter should be calibrated annually and a Calibration Certificate should be filed on site. - An outflow meter should be installed and flow meter readings from this meter should be recorded daily. This is a requirement from DWS. - Desludge the primary settling tanks twice a day and ensure complete desludging. - The primary settling tanks should be sampled and analysed monthly. - Ensure that the flow is divided 50:50 between the two tanks. - Maintenance on the biofilter arms should be done regularly. - Remove all papers from the surface of the stone media daily. - Ensure all ports are clean and open. - Flush filter media regularly. - Repair the leak on the biofilter arm. - Sludge from the digester should be sampled monthly to evaluate digestion. - Control the pH at 7.00 in the digester, by adding lime as required. - Operate aerators accordingly to an aeration programme that facilitates denitrification. - Maintain mixed liquor pH at 7.00 by adding lime as required. - Consider plant extensions that incorporate an anoxic zone to assist with denitrification. - Excess sludge should be wasted regularly in order to control the MLSS concentration in the range 4000-6000 mg TSS/l. - The Process Controller should monitor the sludge settleability daily and maintain a constant mixed liquor suspended solids concentration. - To successfully maintain a viable biological population and to maintain the proper concentrations of solids, the system requires continuous observation and monitoring by the Process Controller. - Sludge records should be kept of quantities of sludge wasted as well as quantities discarded. - Consider the addition of more drying beds. - Remove all weeds from the maturation ponds regularly. - Remove bulking sludge from the ponds. - Replace scales and monitor usage. - Replace gas monitoring system and replace gas mask. - Always ensure 0.25 mg/l Free Chlorine in the final effluent. - Ensure that the correct testing parameter templates are updated on the IRIS to ensure that compliance percentages are correct. - The buildings should be refurbished, particularly the toilet block. - The following is required for process control: pH Buffers on site and meters calibrated regularly; Aerator hour meter readings; All pump meter readings; Stock records; Records of amounts of sludge wasted - Daily Tests Required: pH readings of all units; Free and Total Residual Chlorine readings; Dissolved Oxygen measurements on AT and STs - Testing equipment should be implemented. - Settleable solids of aeration tanks should be performed with 1000ml measuring cylinders as opposed to the Imhoff Cones. - Two shift members should be always on site. - Staff should attend Safety Meetings. A Safety Representative should be appointed on site. - Signage should be upgraded. "No Swimming/No Eating" sign should be introduced alongside signboard at gate. - Emergency eyewash/shower should be available at the chlorine room. - Implement a gas leak detector. - Replace the broken breather apparatus. - Replace wind sock. - Restrict access to ponds. - Place floating aids at ponds. - Service fire extinguisher annually, as needed. - Gates should be always locked.
Montagu	- Investigate the origin of the high conductivities in the raw sewage. - Install outlet flow meter and record flow meter readings daily. This is a requirement from DWS. - The flow meter should be calibrated annually and a calibration certificate should be displayed at the works. - Repair aerator No.2 and operate all aerators continuously. - Repair the in-line Dissolved Oxygen meters. - Repair unserviceable aerator and operate all aerators continuously.

Table C.3.14: Recommendations for the various WWTWs, as included in the WWTW Process Audits (2018/2019)

WWTW	Recommendations
	- Excess sludge should be wasted regularly in order to control the MLSS concentration in the range 4000-6000 mg TSS/l. - The Process Controller should monitor the sludge settleability daily and maintain a constant mixed liquor suspended solids concentration. - To successfully maintain a viable biological population and to maintain the proper concentration of solids, the system requires continuous observation and monitoring by the Operator. - The RAS from all three settling tanks should be sampled monthly in order to determine the sludge return rates, once all three settling tanks are in operation. - Maintain adequate sludge return rates to prevent pipe blockages. - A drainage system should be implemented that will direct drainage from the drying beds back to the biological reactor for further treatment (as this might be necessary). - Vegetation (grass) in and around ponds should be adequately controlled by regular maintenance. - Always ensure 0.25 mg/l Free Chlorine in the final effluent to ensure satisfactory disinfection. - Clean out chlorine contact tank at regular intervals. - Implement a gas leak detector. - Gas bottles should be wall-mounted on a scale. - Chlorine system to be serviced regularly. - Ensure that the correct testing parameter templates are updated on IRIS to ensure that compliance percentages are correct. - The state of the buildings requires urgent attention. - Generator should be enclosed in proper structure that protects it against weather elements. - Upgrade Registration Certificates once received. - Each WWTW should have its own dedicated Dissolved Oxygen meter. - The following is required for process control: pH Meter; pH Buffers on site and meters calibrated regularly. - All certificates should be updated accordingly and be displayed. - Proper warning signs should be erected where necessary. - A gas leak detector should be implemented. - An eye wash shower should be implemented. - A scale should be made available at the chlorine room to monitor available stock left inside gas cylinder. - No Swimming/Eating/Entry sign should be displayed on gate at WWTW.

The WWTWs to be upgraded in Langeberg Municipality are summarised in the table below:

Table C.3.15: WWTWs to be Upgraded in the Future

WWTW	Short, Medium, Long Term	Estimated Cost (Vat Excluded)
Upgrade Robertson WWTW	Short (0-5yrs)	R45 598 455
Upgrade McGregor WWTW	Medium (5-10yrs)	R8 000 000
Upgrade Bonnievale WWTW	Long (>10yrs)	R7 500 000
Upgrade Ashton WWTW	Medium (5-10yrs)	R20 139 448
Upgrade Montagu WWTW	Long (>10yrs)	R7 815 987
Total		R89 053 890

Key issues to be addressed at the WWTWs, as identified through the WSDP inspection process, are as follows:

- Robertson WWTW:
 - Door of ablution facility building to be replaced (Door was stolen).
 - Drain valve of inlet structure does not work and inlet structure overflow during rainy periods. Sluice gates are broken and therefore cannot clean the grit channels.
 - Sluice gates of flow splitter box, that split flow between old and new works, do not work.
 - Panel for manual switch on/off PST No.1 is not working. Cover needs to be removed to switch it on/off. Scum box of PST No.2 needs to be repaired.
 - Valve is required on sludge pump to bleed the pump.
 - Arms of Trickling Filter No.2 need to be replaced.
 - There is only one pump for the Digester PS.
 - Humus Tank No.2 is not in use, cannot discharge sludge.

- Sand and stone to be replaced of seven drying beds
- Platform is required for trucks for the removal of skips.
- One mixer of the Biological Reactor (Anoxic basin) is not working.
- The motor of one of the aerators of the Biological Reactor (Aerobic basin) is not working.
- The lighting around the site is not adequate. There is no security gate for the MCC building.
- Sludge removal from the SST is not adequate. Pumps need to be operated manually.
- The floating aerator on the maturation pond is not working.
- The ponds should be emptied and cleaned out. Remove also weeds from the pond banks and repair the banks.
- Security gate of the chlorination building was stolen and needs to be replaced.
- The flow meter for the outflow needs to be repaired.
- Railings are required around the humus and settling tanks for safety.
- McGregor WWTW:
 - A flow meter needs to be installed for the measuring of the incoming flow to the plant.
 - Both maturation ponds are overgrown with reeds and weeds and the ponds need to be cleaned.
 - The anaerobic septic tank needs regular desludging.
- Bonnievale WWTW:
 - The drum screen at the inlet works is not working, because a faulty probe.
 - A flow meter needs to be installed for the outflow.
 - Excessive reeds in maturation ponds to be removed and cleaned.
- Ashton WWTW:
 - Sluice gates at inlet structure were stolen and need to be replaced.
 - A flow meter needs to be installed for the outflow.
- Montagu WWTW:
 - SST No.2 is currently not in use (Wheel alignment of bridge to be corrected).
 - RAS/WAS PS for SST No.1 and SST No.2 is not working.
 - A flow meter needs to be installed for the outflow.

The table below gives an overview of the recommendations for the refurbishment and the O&M activities that need to be addressed at the WWTWs.

Table C.3.16: Recommendations for the Refurbishment of the WWTWs and the O&M Activities that Need to be Addressed at the WWTWs.		
WWTW	Recommendations	Estimated Cost (Vat Excluded)
Robertson	Refurbish / repair the items noted during the WSDP site inspection and the items identified during the detail WWTW Process Audits.	R1 608 500
McGregor	Refurbish / repair the items noted during the WSDP site inspection and the items identified during the detail WWTW Process Audits.	R175 000
Bonnievale	Refurbish / repair the items noted during the WSDP site inspection and the items identified during the detail WWTW Process Audits.	R125 000
Ashton	Refurbish / repair the items noted during the WSDP site inspection and the items identified during the detail WWTW Process Audits.	R175 000
Montagu	Refurbish / repair the items noted during the WSDP site inspection and the items identified during the detail WWTW Process Audits.	R315 000
Total		R2 398 500

Water and Sanitation Schemes:

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

Table C.3.17: Future Water Reticulation Infrastructure Required
Robertson The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. Several inter-connections and zone valves are required to re-zone the distribution system. Reinforcing pipelines are required to improve supply and ring network conveyance in the Reservoir 1 zone. A new main supply pipeline is required to the Nkqubela area. <u>Proposed distribution zones:</u> • The reservoir 2 and 3 zone boundaries are changed so that the new zones are enlarged. This is done to ensure that the storage capacity in the upper zones is optimised for the future demands and to improve pressures in the zones. • A future booster pump zone for the higher lying areas of the Reservoir 4 zone is proposed. • The rest of the zones remain the same apart from the fact that they are enlarged to accommodate future development areas.
McGregor The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A few distribution pipelines are required to reinforce water supply within the distribution network. Inter-connection pipes and zone valves are also required to re-zone the existing network to incorporate the new booster zone. <u>Proposed distribution zones:</u> • The McGregor reservoir zone is increased to include future development areas Mc01 – Mc05. • The zone boundaries of the McGregor reservoir zone are changed to include the new booster zone. A new booster zone is proposed for the existing higher lying erven of McGregor that currently experiences low static pressures.
Bonnievale The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. Several inter-connections are required to improve the network conveyance in Happy Valley. Reinforcing pipelines are required to improve network conveyance in the old reservoir zone. A new main supply pipeline is required in the new reservoir zone to supply future development areas B03 & B06 – B09. <u>Proposed distribution zones:</u> • The zone boundaries in Happy Valley are changed slightly so that the new reservoir zone is enlarged while the old reservoir zone is reduced. This is done to ensure that the spare storage capacity in the new reservoir is utilised while the deficit in storage in the old reservoir could be reduced. • The boundaries of the new reservoir zone are increased to include future development areas B03 & B06 – B09. • It is further proposed that a PRV is installed on the main supply pipeline from the new reservoir feeding the Town area to reduce the pressure by 20m. A high occurrence of pipe breaks has been experienced in this area if the pressure is not relieved via a "choked" valve to the Town Central network.
Ashton The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. A few distribution pipelines are required to reinforce water supply within the distribution network. The most significant is the upgrading of the supply pipelines between Ashton WTW and Cogmanskloof reservoir to Langeberg and Ashton Foods through the Cogmanskloof zone network. Upgrading of the supply pipelines between the Conradiedorp reservoir and future development area A06 and the supply pipeline between the Zolani reservoir and future development area A07 are also required. <u>Proposed distribution zones:</u> • The Conradiedorp PRV zone is included in the Cogmanskloof zone. • The Cogmanskloof reservoir zone is increased to include future development areas A01 – A05 & A09. • The Conradiedorp reservoir zone is increased to include future development areas A06 & A08. • The boundaries of the existing Zolani zone are increased to accommodate future development areas A07, A10 & A11.
Montagu The existing water distribution system has insufficient capacity to supply the future water demands for the fully occupied scenario and the additional future development areas. Several distribution pipelines are required to reinforce water supply within the distribution network as well as new supply pipelines for the new future development areas. A few inter-connection pipes and zone valves are also required to re-zone the existing Ashbury Lower network in order to incorporate the proposed Ashbury Upper zone. <u>Proposed distribution zones:</u> • A new Ashbury Upper zone is proposed for the higher lying areas in the existing Ashbury Lower zone and to accommodate future development areas M07 – M09, M12, M13 & M16. It is proposed that this zone is supplied from the existing Ashbury Upper reservoir. • The boundaries of the existing Montagu South, George Brink and Ashbury Lower zone are increased to accommodate the future development areas M01 – M06, M14, M15 & M18.

Sanitation Schemes: The Sewer Master Plans of Langeberg Municipality (March 2012) summarise the projects (Master Plan Items) necessary to cope with the increased future demands and developments within the Municipality. The proposed future drainage areas and required works for each drainage area are included in the sewer Master Plans.

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. The items identified as part of the Sewer Master Planning process, to accommodate the anticipated future sewer flows, are included in Annexure A.

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

Table C.3.18: Future Sewer Reticulation Infrastructure Required	
Robertson	
- The existing drainage areas are increased to accommodate proposed future development areas. - Upgrading of a few existing outfall sewers by replacement with larger sized sewers is proposed. - New gravity outfall sewers are required to collect the sewage from the FDAs R06 – R08, R16 and R24. - When Robertson PS reaches capacity, it should be upgraded to a capacity of 27 l/s and the existing rising main should be upgraded to a dia. of 200mm if high pump velocities are not desired.	
McGregor	
- The existing drainage area is increased to accommodate proposed future development areas Mc01 to Mc05. - When overflow problems occur in the 100mm – 200mm dia. section of outfall sewer near the McGregor WWTW due to the servicing of all stands and development of the future areas, these outfall sewers should be replaced with larger diameter. - A new PS and rising main is proposed for future development area Mc01. - All even not serviced with waterborne sewers should be linked to the proposed sewer layout to extend the network to the entire McGregor town.	
Bonnievale	
- The existing drainage areas are increased to accommodate proposed future development areas. - New gravity outfall sewers are required to collect the sewage from future development areas B03 and B06 – B09. - When overflow problems occur in the 160mm dia. outfall sewer in Milners Road in the Happy Valley drainage area and the 160mm dia. outfall sewer to PS No.4, these outfall sewers should be replaced with a larger diameter. The slopes of these outfall sewers were unknown and modelled on minimum slope and if the gradient turns out to be steeper, upgrades of these items might not be required. - No PS information was available and the pump capacities were therefore assumed according to the minimum required scouring velocities in each rising main. - When PS No.3 reaches capacity, it should be upgraded to a capacity of 105 l/s and the existing rising main should be upgraded to a diameter of 355mm.	
Ashton	
- The existing drainage areas are increased to accommodate proposed future development areas. - New gravity outfall sewers are required to collect the sewage from future development areas A01 – A09. - A new PS and rising main that discharged into the existing Ashton Gravity drainage areas is proposed for the lower lying areas of future development area A07. - Several existing outfall sewers require upgrading by replacement with larger sewers. The slopes of these outfall sewers were unknown and modelled on minimum slope and if the gradient turns out to be steeper, upgrades of these items might not be required. - When the Ashton PS reaches capacity, it should be upgraded to a capacity of 80 l/s and the existing rising main should be upgraded to a diameter of 315 mm.	
Montagu	
- The existing drainage areas are increased to accommodate proposed future development areas. - It is proposed that when development of FDA M11 commences, the existing Ashbury PS is decommissioned and the flow from the Ashbury drainage area is diverted with new gravity outfall sewers to the existing Montagu PS1 drainage area. - Upgrading of a few existing outfall sewers by replacement with larger sized sewers is proposed. - New gravity outfall sewers are required to collect the sewage from FDA M07. - When the Montagu PS No.2 reaches capacity, it should be upgraded to a capacity of 41 l/s and the existing rising main should be upgraded to a diameter of 250mm. - When Montagu PS No.1 reaches capacity, it should be upgraded to a capacity of 120 l/s and the existing rising main should be upgraded to a diameter of 355mm.	

TOPIC 4: WATER SERVICES OPERATION AND MAINTENANCE

Table C.4.1: Water Services O&M						
Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project / Activity addressing this problem?	Current Demand Overall Scoring %
O&M Plan	Yes	100.0	Operation and Maintenance tasks for the various water and sewerage infrastructure components, as indicated under Sections 4.1.1 to 4.1.10 of the "Future Demand and Functionality Requirements" WSDP Master Plan should be implemented. Ensure the required O&M schedules are in place and signed off.	100.0	Yes	92.9
Is There an O&M Plan?						
Resources	Yes	100.0	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 the operations and maintenance of the systems, a budget of approximately 1% to 2% of the value of the system is typically required to ensure that the systems remain in good condition.	100.0	Yes	92.9
Information	Yes	100.0	Ensure that the required O&M Manuals are in place for all the water and sewerage infrastructure.	100.0	Yes	92.9
	Yes	100.0	Ensure all the water and sewerage infrastructure are included in the Asset Register.	100.0	Yes	92.9
Activity Control & Management	Yes	100.0	Groundwater: Implement recommended daily, weekly, monthly, and six-monthly O&M activities for the boreholes.	100.0	Yes	92.9
	Yes	100.0	Surface water infrastructure: Implement preventative maintenance procedures.	100.0	Yes	92.9
	Yes	100.0	Bulk and water reticulation networks and fittings: Compile daily, weekly, monthly, and annual maintenance checklists for the maintenance activities for the water reticulation networks and fittings.	100.0	Yes	92.9
	Yes	100.0	WTWs: Evaluate the existing O&M schedules for the WTWs against the recommended O&M tasks and ensure all required activities are adequately monitored and recorded.	100.0	Yes	92.9
	Yes	100.0	Water PSs: Compile weekly and monthly maintenance checklists for the recommended activities for all the water PSs and all PSs need to be inspected on at least a weekly basis.	100.0	Yes	92.9
	Yes	100.0	Reservoirs: Compile maintenance checklists for the recommended reservoir maintenance activities and document all inspections.	100.0	Yes	92.9
	Yes	100.0	Remote monitoring and Control Systems: Ensure adequate maintenance is carried out on the SCADA systems and compile maintenance checklists for the recommended activities.	100.0	Yes	92.9
	Yes	100.0	Sewer PSs: Compile weekly and quarterly maintenance checklists for the recommended activities for all the sewer PSs and all centrifugal pump stations need to be inspected on at least a weekly basis.	100.0	Yes	92.9
	Yes	100.0	Bulk and sewer drainage networks: Annual, monthly, and weekly schedules for maintenance should be drawn up for the bulk and sewerage networks. Regular cleaning of sewer lines and all blockages and their precise locations should be recorded.	100.0	Yes	92.9
	Yes	100.0	WWTWs: Evaluate the existing O&M schedules for the WWTWs against the recommended O&M tasks and ensure all required activities are adequately monitored and recorded.	100.0	Yes	92.9

It is important for Councils to understand the value of maintenance and provide the necessary funding to properly operate and maintain infrastructure. It is the responsibility of the municipal and technical managers to educate and inform Councils on this and help councillors explain these issues to their communities. **Successful municipalities depend to a single principle – effective and efficient management!**

Much of the routine work of technical departments involves managing and undertaking the O&M of services that is done in-house by municipal staff. A second major aspect of work is managing O&M undertaken by external service providers. The third major area is new or capital projects, also usually undertaken by external service providers.

Each service area in Langeberg Municipality needs an O&M system that monitors and assesses infrastructure condition and plans the required preventative maintenance, and when necessary, rehabilitation, upgrading or replacement of infrastructure. This is a major part of an overall Asset Management System, which

- records, describes all infrastructure assets;
- monitors and assesses their condition;
- plans and monitors maintenance;
- plans upgrading, rehabilitation and replacement; and

- values assets and the costs of maintenance, upgrading, rehabilitation and replacement.

There are a wide range of **desirable objectives** that should be achieved with the help of maintenance.

- Retain an asset in a serviceable condition during its designed life span.
- Optimize the reliability of equipment and infrastructure.
- Ensure that the equipment and infrastructure are kept in a good condition.
- Ensure prompt emergency repair of equipment and infrastructure to sustain service delivery.
- Act before repair costs become too high.
- Ensure operation by eliminating breakdown risks or limiting them as much as possible.
- Improve delivery by upgrading infrastructure.
- Enable repairs under the best possible conditions.
- Improve operational safety and remove causes of accidents.
- Reduce the overall management burden through better work preparation and reduced unforeseen production stoppages.
- Protect the environment.

To achieve these objectives, it is necessary to train personnel in specific maintenance skills and to influence their attitudes, as better operational results depend on motivated staff who are committed to proper maintenance procedures and standards.

Setting up a preventative maintenance programme is one of the most effective ways of reducing breakdowns and keeping equipment and infrastructure in good condition. It is important to implement such a programme as soon as new equipment or infrastructure is put into service.

Implementing a preventative maintenance programme requires a **maintenance plan**, with particular emphasis placed on the following:

- Periodic inspection of equipment according to a pre-established programme so that working conditions may be checked.
- Systematic servicing – the first step in devising this programme is to forecast the life of parts and components subject to wear, i.e., the study of reliability, failure modes and effects and fault analysis.
- Overhauls, which often require considerable work, should be planned during low production periods.

The complexity of maintenance activities should be analysed to set up an efficient maintenance plan and to take management decisions, e.g., regarding use of own resources and unskilled or skilled resources. **Five levels of maintenance** can be distinguished, depending on the complexity of the work and the urgency of action.

- Simple adjustments are generally applicable to accessible components and require no dismantling or opening of the equipment. These adjustments involve the completely safe replacement of accessible consumable components such as signal lights or some types of fuses. Servicing of this type may be performed by the operator on site, without tools, following the instructions for use. The stock of consumable parts required is very small.
- Troubleshooting entails minor preventative maintenance operations such as greasing or checking for proper functioning. Servicing of this type may be performed on site by an authorised technician. An authorised technician has received training that enables him/her to perform such maintenance work safely and is aware of potential problems.
- Breakdowns require identification, diagnosis, and repairs by replacing components or working parts. Servicing of this type must be carried out by trained persons, on site or in the maintenance shop, using the documentation (manuals, spare part lists, etc.) necessary for maintenance of equipment.

- Major maintenance work covers all major corrective or preventative work except modernization and rebuilding. Servicing of this type must be carried out by a team that comprises highly skilled technical specialists, using the relevant documentation.
- Modernising and rebuilding equipment or executing major repairs is usually done by the manufacturer or builder. Resources are specified and usually very similar to those used in the original manufacturing or construction.

To ensure **good quality O&M**, technical managers firstly need to ensure that staff responsible for in- house O&M

- understand equipment and infrastructure;
- understand and implement the proper O&M requirements and procedures;
- understand the required service and operating standards;
- have and develop the necessary O&M skills;
- assess equipment and infrastructure conditions;
- understand and identify typical defects and problems;
- solve problems and make necessary repairs, or engage experts to do so; and
- record all activities to provide data for planning and analysis of O&M.

Secondly technical managers must ensure that they contact competent external service providers.

The bulk of O&M activities should be of a preventative nature. That is regular checking all the water and sewerage infrastructure and ensuring that everything is in good operational condition. Sections 4.1.1 to 4.1.10 of the “Future Demand and Functionality Requirements” Water Services Master Plan include recommended O&M tasks for the various water and sewerage infrastructure components that should be implemented by Langeberg Municipality.

TOPIC 5: CONSERVATION AND DEMAND MANAGEMENT

Table C.5.1: Conservation and Demand Management - Water Resource Management						
Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
Reducing unaccounted water and water inefficiencies	Yes	100.0	Implement the proposed WC/WDM Strategy and the 25 WC/WDM items. Ensure adequate budget is allocated under the Capital and Operational budgets towards the implementation of the WC/WDM initiatives.	100.0	Yes	92.9
	Yes	100	Set up meeting with the Large Water Users to discuss water consumption status, potential water saving volumes and to cultivate a water saving awareness within each large water user.	100.0	Yes	92.9
Leak and meter repair programmes.	Yes	100.0	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.	100.0	Yes	92.9
	Yes	100	Continue with the current phased pipeline rehabilitation programme.	100.0	Yes	92.9
	Yes	100	Repair or replace Hoops River bulk water meter at Robertson WTW. Install zone bulk water meters in order to determine the NRW and water losses for specific zones. Ensure that the incoming flow, final flow, and effluent re-use for irrigation purposes are metered at all the WWTWs.	100.0	Yes	92.9
	Yes	100	Install water meters at all the unmetered erven.	100.0	Yes	92.9
Consumer/end-use demand management: Public Information & Education Programmes	Yes	100.0	Support schools with WDM initiatives	100.0	Yes	92.9
	Yes	100.0	Langeberg Municipality can consider adding helpful hints on effective water usage on the monthly bills. Community awareness programmes should be initiated to inform consumers of the importance of WC/WDM.	100.0	Yes	92.6

Table C.5.1: Conservation and Demand Management - Water Resource Management

Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
Conjunctive use of surface - and groundwater	No	100.0				100.0
Working for Water	No	100.0				100.0

Table C.5.2: Conservation and Demand Management - Water Balance

Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
Water Balance	Yes	100.0	Ensure that the volume of water supplied from all water resources are metered (each individual source separately), the raw water and final water at the WWTWs and the volume of water supplied to the various zones (at Reservoirs). The inflow at the WWTWs, the volume of treated effluent re-used and the volume of treated effluent returned to the water resource system also need to be metered at all the WWTWs.	100.0	Yes	92.6

A 2021 WC/WDM Strategy is in place for Langeberg Municipality. DWS's Municipal Scorecard for assessing the potential for WC/WDM efforts in Municipalities was used to assess the potential for WC/WDM efforts in Langeberg Municipality. The aim of the scorecard was to establish areas where the municipality has made good progress in relation to WC/WDM and where there is still room for improvement. The status quo score for Langeberg Municipality is 69 out of 100 suggesting that there is some room for improvement in the implementation of WC/WDM.

The proposed WC/WDM Strategy for Langeberg Municipality is based on the 25 WC/WDM items listed in the table below:

Table C.5.3: Proposed WC/WDM Strategy Items for Langeberg Municipality

Item 1: Development of a Standard Water Balance
Recommendation and Strategy: - Continue with the monthly updating of the IWA Water Balances for all the systems and reporting on the NRW and Water Losses for each of the systems to management. Employ and train a dedicated senior technician to manage NRW analysis. - Continue with the drafting of an annual WSDP Performance and Water Services Audit Report, as required by the Water Services Act. - Implement the recommended WC/WDM activities in order to reduce the NRW and Water Losses. - Determine all unbilled authorized consumption by firstly identify all the relevant consumers, e.g., Municipal buildings, parks, fire services, sport fields, etc. Unbilled consumption does not generate income, but will enable the municipality to better quantify their actual water losses.
Funding and Budget Requirements: The IWA Water Balances for the systems are updated monthly by the municipality.
Item 2: Pressurised System always
Recommendation and Strategy: - Adequate human resources, technical skills and O&M budgets need to be allocated towards the operation, maintenance, and refurbishment of the existing infrastructure, to ensure that systems are always pressurised. - Existing water pump stations that are in a poor condition needs to be refurbished.
Funding and Budget Requirements: Budgets as indicated under the individual items of the WC/WDM Strategy. Increase O&M budget allocations towards the refurbishment and replacement of old water infrastructure.
Items 3 and 4: Metering System
Recommendation and Strategy: - All un-metered water connections need to be provided with water meters. Meters need to be read monthly and consumers need to be billed monthly according to their actual water usage. In addition to water theft, many water accounts go unnoticed in the system or have some type of data inconsistency that results in no revenue being generated for the water use event. The Treasury data therefore needs to be cleaned and the municipality needs to identify and correct any inaccurate data in the system (See Table 7.5.1 of the Administration, Information and Comprehensive Overview Report). - Consumer consumption checks / investigations need to be carried out where water usage is very low, but there are households on the property. This project will give a clear indication of where illegal or unregistered connections is being made and whether the meter is under reading the actual consumption, thus water is being used but not billed or recorded.

Table C.5.3: Proposed WC/WDM Strategy Items for Langeberg Municipality
- A complete meter audit should be undertaken in all towns. All illegible / broken / old meters should be replaced. Any un-metered stands should be metered and meter readings in the billing system should be updated where required. All meter boxes should also be cleaned as part of the audit. - Municipality needs to continue with the implementation of their Meter Management / Replacement program. An effective Meter Management / Replacement Program needs to achieve the following objectives: - Determine the on-going meter replacement programme; - Determine exception reports on meters which are suspected to be faulty; - Test and replace faulty meters; and - Size meters correctly. The activities of this program that needs to be budgeted for are as follows: - Research and development of a meter replacement policy and meter management / replacement programme; - Implementation of a uniform meter management information system; - Testing and replacing faulty meters reported by consumers (Part of reticulation function). - Replacement of domestic meters with AMR enabled format (where appropriate) in accordance with meter management / replacement programme.
Funding and Budget Requirements: Install water meters for all un-metered water connections. Estimated budget requirement for the installation of individual water meters is R1 817 500. Estimated budget of R800 000 is required for a detail water meter audit and cleaning of meter boxes of approximately 18 000 stands.
Item 5: Effective and Informative Billing System
Recommendation and Strategy: - Municipality needs to ensure that all customer's meters are read monthly and that the customers are billed on a monthly basis according to the actual volume of water used for the specific month. - Municipality needs to continue with the commercial data analysis done on the billed metered consumption data, which include the identification of un-metered even, investigating meters with zero consumption, investigating abnormal low and high consumption readings, oversized / undersized meters, etc. - The Municipality can consider the following additional measures to make the current consumer bills more informative. - Adding a graph of the previous 12 months' consumption and helpful hints on effective water usage on the monthly bills. - Alert consumers of possible leaks on their properties. For instance, if the consumption for a particular month is >25% than the average consumption of the previous months the consumer may be alerted of a possible leak on the property. - Monitor trends and follow up telephonically.
Funding and Budget Requirements: Estimated cost to enhance the user friendliness of the municipal bill is R275 000.
Items 6 and 7: General Complaints System
Recommendation and Strategy: The municipality needs to ensure that all consumers are familiar with the telephone numbers to lodge complaints and report leaks. Suggestions would be to include these numbers on the monthly water bills, on the Municipality's website, strategically located notice boards, radio broadcasts, etc. The projects and measures that can be implemented for passive leakage control are as follows: - Improve the help-line and install an automated answering system. - Advertise the help-line. - Investigate current problems in responding to leaks and allocate adequate resources to avoid lengthy delays. - Review and develop a policy regarding responses to leaks with the aim of reducing response time, prioritising and keeping consumers informed. - Develop a monitoring system and quality assurance measures to ensure problems are resolved adequately. Link such a KPI to the SDBIP. - Develop a client, Services Charter. The Consumer Services Charter should include the following information: - Commitment to deliver excellent services to our clients (Executive Mayor and Municipal Manager). - Standards of services (Enquiries written and telephonic; Accounts enquiries and distribution of accounts). - Response times for different services (Water: Repairs to networks, installation of new household water connections, etc.) - Contact details for different areas.
Funding and Budget Requirements: Budget requirement for improved customer awareness raising regarding the Municipality's Complaints System R130 000/annum.
Item 8: Asset Register for Water Infrastructure
Recommendation and Strategy: The municipality needs to ensure that all the existing water and sewerage infrastructure is included in the Asset Register. The CRC of the assets also needs to be included in the Asset Register.
Funding and Budget Requirements: None - To be done as part of the annual updating of the Asset Register by the municipality.
Item 9: Asset Management Capital Works

Table C.5.3: Proposed WC/WDM Strategy Items for Langeberg Municipality
Recommendation and Strategy: Allocate a budget of at least 2% of the total water asset value per annum towards the replacement of existing infrastructure. Municipality needs to differentiate in their capital budget between new projects and projects that are for the replacement of existing infrastructure, to accurately calculate the annual percentage allocated towards the replacement of existing infrastructure.
Funding and Budget Requirements: Capital budget of at least 2% of the total water and sewerage asset value allocated towards the replacement of the existing water and sewerage infrastructure.
Item 10: Asset Management Operation and Maintenance
Recommendation and Strategy: The municipality needs to differentiate between budget allocated towards the operation and maintenance of the water infrastructure and the budget allocated towards the replacement of the water and sewerage infrastructure. A budget of approximately 1% to 2% of the value of the system is typically required for the operations and maintenance of the system to ensure that the system remains in good condition. The municipality needs to compile an Asset Management Plan (AMP) to ensure efficient, effective, and optimal management, operation, and maintenance of all assets, which includes treatment plants, reservoirs, structures, buildings, pipelines, sites, etc. It is important for the municipality to develop an AMP from their Asset Register. The objective of an AMP is to support the achievement of the strategic goals of the Municipality and facilitate prudent technical and financial decision-making. It is also a vehicle for improved internal communication and to demonstrate to external stakeholders the Municipality's ability to effectively manage its existing infrastructure as well as the new infrastructure to be developed over the next 20 years. This plan must be based on the principle of preventative maintenance to ensure that, as far as this is practical, damage to assets is prevented before it occurs. The municipality needs to ensure that the maintenance and rehabilitation plan is part of the WSDP and that the plan is implemented. Assets must be rehabilitated and / or replaced before the end of their economic life and the necessary capital funds must be allocated for this purpose. Priority should be given to rehabilitating existing infrastructure as this generally makes best use of financial resources and can achieve an increase in (operational) services level coverage is most rapidly. The preparation of maintenance plans and the allocation of sufficient funding for maintenance are required to prevent the development of a large condition backlog. The potential renewal projects for the water infrastructure need to be identified from the Asset Register. All assets with a condition grading of "poor" and "very poor" need to be prioritised. The O&M Budget allocated towards repairs and maintenance should include the replacement of malfunctioning and old bulk water meters and consumer water meters, clearing of meter chambers, buying replacement mechanisms for bulk water meters, speedy repair of leaks, leak detection in areas with high water losses and NRW and higher than expected night flows, etc.
Funding and Budget Requirements: Additional budget should be allocated towards the repairs and maintenance of the existing water and sewerage infrastructure. The additional budget should be determined by the municipality once an AMP is developed. A budget of approximately 1% to 2% of the value of the system is typically required for the operations and maintenance of the system to ensure that the system remains in good condition. An estimated budget for the drafting of an AMP for all the water and sewerage infrastructure is R650 000.
Item 11: Dedicated WC/WDM Support
Recommendation and Strategy: The municipality should allocate at least one (1) person to head WC/WDM for a start. The number of people involved with WC/WDM measures can later be increased as and when required.
Funding and Budget Requirements: The municipality may be able to use one of their existing staff members. If a new person must be appointed the municipality can determine the costs involved with such an appointment.
Item 12: Active Leakage Control
Recommendation and Strategy: The night flow analysis indicates the potential areas with higher-than-expected leakage and the results from the analysis can be used to prioritise the areas for active leakage control. The following process needs to be followed for active leakage control of the reticulation network: <u>Decide on how the work will be undertaken:</u> - The appointment and training of additional staff. - The training of existing staff. - Appoint an external contractor in the first few years with the objective of using this contractor to train the internal teams and build capacity to do all work internally. - The above three options need to include the purchase or re-allocation of equipment. - Complete outsourcing of the activity. <u>Leak detection:</u> Identify areas with highest leaks and send teams into the field to detect leaks. <u>Repair of leaks once identified:</u> Once leaks were detected they will need to be repaired. Depending on the extent of the leaks and other workloads, the leak repairs need to be carried out by either the internal teams or a contractor.
Funding and Budget Requirements: R200 000 to undertake leak detection in zones with high excess night flows. In addition, allocate approximately R125 000 per year for general visual leak inspections.
Item 13: Sectorization of Reticulation Systems
Recommendation and Strategy:

Table C.5.3: Proposed WC/WDM Strategy Items for Langeberg Municipality
The billed metered data currently linked to the distribution systems should also be linked to the different reservoir zones in the future where possible, to accurately determine the NRW and water losses for the specific reservoir zones in the future. Faulty bulk water meters need to be replaced and new meters need to be installed for the reservoirs with no bulk water meters. The recommended bulk water meters are indicated on the Schematic Layouts in Annexure C of the Administration, Information and Comprehensive Overview WSDP Report. The Financial Department needs to continue to provide the billed metered consumption data separately for each of the systems. Sectorization will assist with the following: • Clear indication of how much water is being used per area / zone. • Areas with high NRW and water losses can easily be identified. • Leakage and pressure control can be better managed. • Water demand per area / zone can be determined. Night flows need to be measured for zones with expected high-water losses. It is recommended to re-log the night flows every few years to determine if there was an increase in leakage.
Funding and Budget Requirements: The estimated cost for the logging of flows and pressures for zones with expected high-water losses is R300 000. The logging exercise should be repeated at least every three years. A budget should be allocated to investigate and resolve possible zone interconnections. It is however difficult to price such investigations at this stage.
Item 14: Effective Bulk Metering Management System
Recommendation and Strategy: • All bulk water meters at existing WTWs, reservoirs and pump stations need to be read and recorded on at least a weekly basis. • The Hoops River raw water meter needs to be repaired or replaced. • All bulk water meters need to be installed in lockable meter chambers and reservoir sites and water pump stations need to be secured to prevent unauthorised access and possible damage to the water meters. • New bulk water meters need to be installed correctly. Ideally a straight pipe section upstream of the meter of at least 5x the meter dia. and 3x the meter dia. downstream of the meter. Strainers need to be installed to protect the meters. These strainer elements must be removable from the top, for ease of cleaning. Gate valves are required for maintenance before and after meters. • Every informal area with communal services to be supplied with a bulk water meter in order to determine the unbilled metered consumption. All discrete zones are to be supplied with a bulk water meter. The meter readings must be recorded on at least a weekly basis. The readings can be used to quantify both the water supplied and the leakage for a specific area.
Funding and Budget Requirements: Allow an annual budget of approximately R200 000 for the installation of new bulk water meters, the replacement of faulty bulk water meters and to adequately protect existing bulk water meters.
Item 15: Effective Zone Meter Management and Assessment of Night Flows
Recommendation and Strategy: See recommendations under Item "Effective Bulk Metering Management System" above.
Funding and Budget Requirements: See funding and budget requirements included under Item "Effective Bulk Metering Management System" above.
Item 16: Pressure Management
Recommendation and Strategy: Further analysis will however be required to determine the exact scope, potential cost, and viability for pressure management implementation in each of the areas. A total of eight possible areas were identified. Pressure management should be implemented in selected areas if found to be feasible.
Funding and Budget Requirements: An estimated budget of R300 000 is required for a detailed analysis to determine the exact scope for pressure management.
Item 17: As-built Drawings of Bulk and Reticulation Infrastructure
Recommendation and Strategy: Continue with the updating of as-built drawings on an ongoing basis. Continue also with the regular updating of the Water and Sewer Master Plans.
Funding and Budget Requirements: Allow a budget of approximately R1.25 million for the updating of the Water and Sewer Master Plans every five years.
Item 18: Schematic Layouts of Water Reticulation Systems
Recommendation and Strategy: Municipality needs to continue to update the schematic layouts on a regular basis, in order to ensure they remain accurate.
Funding and Budget Requirements: None
Item 19: Regulation and Bylaws
Recommendation and Strategy: The Water Bylaw needs to be enforced and adequate human resources need to be allocated for this purpose.
Funding and Budget Requirements: No additional budget or funding requirements.
Item 20: Tariffs

Table C.5.3: Proposed WC/WDM Strategy Items for Langeberg Municipality
Recommendation and Strategy: See Section 7.3 under Topic 7 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements: Financial study to determine the impact of changing the sanitation tariff structure from a fixed monthly amount, which is also not based on the number of toilet pans, to a stepped tariff based on water consumption in the future. Estimated cost R250 000.
Item 21: Technical Support to Customers
Recommendation and Strategy: The objective of a Technical Support programme is not limited to assisting consumers in reducing their water demand, but is also to look at wastewater, monitor compliance with by-laws and service conditions and offer general customer support. Once a dedicated person has been allocated to WC/WDM it is recommended to engage with large customers and to identify areas where the municipality can provide assistance. The proposed activities of this programme that can be budgeted for are as follows: • Train existing staff; • Identify and visit large consumers (Checking that large consumers are correctly metered and billed, providing tips on WC/WDM, test the accuracy of all large consumer meters, install data-loggers on all large consumer meters and informing consumers of any sudden change in consumption patterns). • Arrange leakage inspections in public building; • Provide assistance and technical know-how for large consumers; and • Introduce compulsory water management plan for large consumers.
Funding and Budget Requirements: No additional funding – pending the appointment of a dedicated person for WC/WDM.
Item 22: Removal of Un-authorised Connections
Recommendation and Strategy: Langeberg Municipality should continue to remove un-authorised connections as and when they are detected. See Section 5.1.1.5. of the Future Demand and Functionality Requirements WSDP Report
Funding and Budget Requirements: Estimated budget of R1 817 500 is required to install water meters at the unmetered erven.
Item 23: Community Awareness on WDM
Recommendation and Strategy: See Section 5.1.3 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements: It is estimated that R120 000 / year should be allocated for WC/WDM awareness campaigns and activities, material to be included with monthly water bills, placing notices in newspapers, billboards, competitions, etc.
Item 24: Schools Education on WDM
Recommendation and Strategy: See Section 5.1.3.1 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements: It is estimated that a budget of R50 000 per year should be allocated for the establishment of a school's education programme in Langeberg Municipality. The DWS can also assist the municipality with pamphlets and posters on WC/WDM initiatives.
Item 25: Retrofitting
Recommendation and Strategy: See Sections 5.1.2.1 and 5.1.2.2 of the Future Demand and Functionality Requirements WSDP Report.
Funding and Budget Requirements: Leak repair assistance programmes: R250 000 per annum for ongoing exercise to repair leakages at indigent properties using in excess of 20 kl/month. WSIG funding or "War on Leaks" funding from DWS can be requested in this regard. Retrofitting: R300 000 for a pilot project in one of the public buildings.

The way forward for Langeberg Municipality with the implementation of the proposed WC/WDM Strategy is as follows:

- Develop a detailed methodology for measuring the performance criteria for each of the twenty-five (25) WC/WDM Strategy items;
- Allow for budget required to implement the various measures;
- Monitor the impact of all WC/WDM measures on an on-going basis;
- Develop key benchmarks for all KPIs and categories and assign responsibility; and
- Review WC/WDM Strategy as necessary.

Langeberg Municipality needs to ensure that adequate funding is allocated under their Capital and Operational budgets towards the implementation of the WC/WDM Strategy. Key WDM projects to be considered during Langeberg Municipality's capital budgeting process are as follows:

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

The WDM initiatives can deliver excellent return on investment if well implemented and well managed. All external funding that could be utilised by Langeberg Municipality for this purpose should be sourced. The O&M Budget allocated to repairs and maintenance should be increased to address amongst other tasks the following:

- Replacement of malfunctioning and old bulk water meters and consumer meters;
- Construction of meter chambers for all bulk water meters not adequately protected against vandalism;
- Cleaning of bulk water meter boxes;
- Buying replacement mechanisms for bulk meters;
- Speedy repair of leaks; and
- Leak detection in areas with higher-than-expected night flows.

Langeberg Municipality has responded to the need to address water losses and NRW within their jurisdiction by implementing various WC/WDM initiatives. The Municipality will also actively implement the proposed WC/WDM Strategy to reduce the percentage of NRW and Water Losses improve water use efficiency within the various schemes as follows:

Table C.5.4: Commitment to Reduce Water Losses and Water Inefficiencies				
Scheme	2022/2023 NRW (%/a)	2022/2023 Water Losses (%/a)	2023 (%/a)	2043 (%/a)
Robertson	13.4%	13.2%	15.0	15.0
McGregor	7.3%	7.1%	15.0	15.0
Bonnievale	23.0%	22.8%	15.0	15.0
Ashton	-11.9%	11.7%	15.0	15.0
Montagu	7.0%	6.8%	15.0	15.0

Water Balance: A segregated single variable future water requirement model was developed for the WSDP and is available in electronic format. The future water requirement for each of the schemes is obtained by means of this model. It is used in this analysis to estimate the future water requirement for each of the distribution systems. The model differentiates between the different income levels.

Water services must be provided in a manner that is consistent with the broader goals of integrated water resources management. There is therefore a need for an integrated planning approach between the development of water services and water resources.

The Infrastructure Leakage Index (ILI) can be used by Langeberg Municipality to determine an appropriate benchmark for managing the water losses according to their own specific circumstances. This ILI can also be compared with the averages for other towns within South Africa. The annual water losses within the various towns' distribution networks are therefore important indicators of the performance of the water supply and distribution systems.

Langeberg Municipality should assess strategic gaps in their IWA water balance data to record those flows, both water and sewerage, that are strategic in terms of medium to long term planning. A prioritisation of these locations should subsequently follow with budget allocated to improve the availability and accuracy of the IWA water balance data.

Langeberg Municipality should continue to update their IWA water balance models monthly to determine the locations of wastage and to enable the Municipality to manage their 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.

Robertson: The following areas need to be focused on for the IWA water balance of Robertson

- The identified unmetered erven, as identified through the 2013 Swift analysis, to be supplied with water meters.
- The faulty Hoops River bulk water meter to be repaired or replaced.
- Bulk water meters to be installed for the different reservoir zones. Bulk zone water meters to be read on a weekly basis at least.
- Volume of final effluent discharged from the Robertson WWTW to be metered.

McGregor: The following areas need to be focused on for the IWA water balance of McGregor

- The identified unmetered erven, as identified through the 2013 Swift analysis, to be supplied with water meters.
- Bulk zone water meters to be read on a weekly basis at least.
- The inflow to the McGregor WWTW to be metered.

Bonnievale: The following areas need to be focused on for the IWA water balance of Bonnievale

- The identified unmetered erven, as identified through the 2013 Swift analysis, to be supplied with water meters.
- Bulk zone water meters to be installed at the 0.750 MI and 2.500 MI reservoir outlets. Bulk zone water meters to be read on a weekly basis at least.
- Volume of final effluent discharged from the Bonnievale WWTW to be metered.

Ashton: The following areas need to be focused on for the IWA water balance of Ashton

- The identified unmetered erven, as identified through the 2013 Swift analysis, to be supplied with water meters.
- The raw water supply from each individual water source to be metered and the readings to be recorded on a weekly basis at least.
- Bulk water meters to be installed for the different reservoir zones. Bulk zone water meters to be read on a weekly basis at least.
- Volume of final effluent discharged from the Ashton WWTW to be metered.

Montagu: The following areas need to be focused on for the IWA water balance of Montagu

- The identified unmetered erven, as identified through the 2013 Swift analysis, to be supplied with water meters.
- The raw water supply from each individual water source to be metered and the readings to be recorded on a weekly basis at least.
- Bulk water meters to be installed for the different reservoir zones. Bulk zone water meters to be read on a weekly basis at least.
- Volume of final effluent discharged from the Montagu WWTW to be metered.

Water Losses: The effective implementation of the proposed WC/WDM Strategy will enable Langeberg Municipality to reduce their NRW and Water Losses for the various distribution systems even further over the next five years.

TOPIC 6: WATER RESOURCES

Topic C.6.1: Water Resource						
Section	Intervention Required?	%	Solution description as defined by topic situation assessment	%	Is there an Existing project/activity addressing this problem?	Current Demand Overall Scoring %
Current Water Sources	Yes	100.0	Ensure the required authorisations (licences) are in place for all the water resources, as well as the required registrations.	100.0	Yes	92.9
Additional Sources Available	Yes	100.0	Actively implement the proposed WC/WDM measures to reduce the current NRW and Water Losses even further.	100.0	Yes	92.9
	Yes	100.0	Continue with the groundwater augmentation options for Montagu to reduce the risk of no water supply from surface water sources during drought periods.	100.0	Yes	92.9
	Yes	100.0	Investigate the possibility of additional supply from the Zanddrift Irrigation Canal and from the Breede River for Bonnievale.	100.0	Yes	92.9
	Yes	100.0	Investigate augmentation options for Ashton and Robertson.	100.0	Yes	92.9
	Yes	100.0	Continue to provide additional raw water storage capacity for the towns with limited raw water storage capacity.	100.0	Yes y	92.9
Monitoring	Yes	100.0	Ensure that all industries apply for the discharge of industrial effluent into the sewer system, to monitor the quality and volume of industrial effluent discharged and to implement the set of by-laws regarding the discharge of industrial effluent into Langeberg Municipality's sewer system to determine whether the quality comply with the standards and criteria.	100.0	Yes	92.9
Water Quality	Yes	100.0	Increase the water quality operational sampling programme to ensure compliance with SANS241:2015 requirements.	100.0	Yes	78.6
	Yes	100.0	Increase the effluent operational sampling programmes at the WWTWs, to ensure proper process control.	100.0	Yes	92.9
Operation	Yes	100.0	Confirm the correct registration volumes and existing lawful use volumes for all sources for the different schemes. This information, with the safe yields of the sources, is critical to accurately determine which sources need to be augmented for the different schemes. Langeberg Municipality further needs to ensure that each individual source is metered and that the abstraction volumes are recorded on at least a monthly basis.	100.0	Yes	92.9

The Western Cape experienced a severe drought over the period 2015 to 2017, with some relief during the 2018 and 2019 winter months. This drought reduced the safe yields of the Municipality's own existing surface water resources. The Municipality therefore continued with the implementation of specific WC/WDM measure to lower the current water requirements and the augmentation of the existing water sources of Montagu with groundwater.

Metering of all water supplied is one of the most significant steps to properly plan and manage watersources. Without metering no management is possible. Langeberg 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 schemes in Langeberg Municipality's Management Area. These models include the future projections up to 2043 and were calibrated by using historic billed metered consumption data and bulk metered abstraction data. The percentage NRW was determined for each of the distribution systems and growth in demand was based on agreed population and growth figures.

The projected future water requirements and the yield surplus or shortfalls are indicated in the table below for each of the schemes.

Table C.6.2: Projected Future Water Requirements and Yields Surplus (+) / Shortfall (-) Based on WSDP Model						
Distribution System	Model	PROJECTED FUTURE WATER DEMANDS (Ml/a)				
		2023	2028	2033	2038	2043
Robertson	2% Annual Growth	2 810.879	3 103.438	3 426.446	3 783.073	4 176.819
	4% Annual Growth	3 097.477	3 768.554	4 585.022	5 578.380	6 786.953
	WSDP Model	2 822.515	3 291.383	3 858.314	4 546.826	5 386.498
	Yield surplus (+) / shortfall (-)	+442.235	-26.633	-593.564	-1 282.076	-2 121.748
McGregor	2% Annual Growth	323.120	356.751	393.882	+434.877	+480.140
	4% Annual Growth	356.066	433.208	527.064	641.254	780.184
	WSDP Model	355.883	394.403	437.676	486.349	541.165
	Yield surplus (+) / shortfall (-)	+844.117	+805.597	+762.324	+713.651	+658.835
Bonnievale	2% Annual Growth	1 740.422	1 921.567	2 121.565	2 342.379	2 586.176
	4% Annual Growth	1 917.876	2 333.389	2 838.925	3 453.986	4 202.302
	WSDP Model	1 744.407	2 026.918	2 360.881	2 756.347	3 225.418
	Yield surplus (+) / shortfall (-)	-499.407	-781.918	-1 115.881	-1 511.347	-1 980.418
Ashton	2% Annual Growth	2 390.324	2 639.111	2 913.792	3 217.062	3 551.896
	4% Annual Growth	2 634.042	3 204.715	3 899.026	4 743.761	5 771.510
	WSDP Model	2 418.285	2 890.310	3 476.985	4 208.544	5 123.428
	Yield surplus (+) / shortfall (-)	+544.243	+72.219	-514.457	-1 246.016	-2 160.900
Montagu	2% Annual Growth	1 575.707	1 739.708	1 920.778	2 120.694	2 341.418
	4% Annual Growth	1 736.366	2 112.555	2 570.246	3 127.097	3 804.592
	WSDP Model	1 757.443	2 069.374	2 446.629	2 904.119	3 460.340
	Yield surplus (+) / shortfall (-)	-267.899	-579.830	-957.085	-1 414.575	-1 970.796
Ashton and Montagu	2% Annual Growth	3 931.717	4 340.934	4 792.742	5 291.574	5 842.325
	4% Annual Growth	4 332.595	5 271.265	6 413.299	7 802.759	9 493.250
	WSDP Model	4 139.720	4 908.951	5 854.950	7 022.230	8 466.979
	Yield surplus (+) / shortfall (-)	+312.353	-456.878	-1 402.878	-2 570.157	-4 014.906

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

Table C.6.3: Years in which the Annual Water Demand is likely to Exceed the Total Yields / Allocations from the Various Water Resources				
Distribution System	Total Allocation / Yield (x 10 ⁶ m ³ /a)	2% Annual Growth on 2018/2019 Demand	4% Annual Growth on 2018/2019 Demand	WSDP Projection Model
Robertson	3.265 (Yield)	2030	2024	2027
McGregor	1.200 (Allocation)	> 2043	> 2043	> 2043
Bonnievale	1.245 (Allocation)	Over	Over	Over
Ashton	2.963 (Allocation)	> 2033	2025	2028
Montagu	1.490 (Yield)	2020	2019	2019
Ashton and Montagu	4.452 (Yield & Allocations)	2029	2023	2025

The immediate augmentation of Bonnievale, Montagu and Ashton water sources is critical to meet future water requirements. The allocation for Bonnievale from the Zanddrift WUA canal is already exceeded, as well as the allocations and safe yields of the Montagu sources. The augmentation of Robertson water sources in the nearby future is also critical.

The Brief desktop source augmentation study, which was completed in 2014 for Langeberg Municipality for the various towns, recommended the following augmentation options.

Table C.6.4: Potential Future Source Augmentation Options (Desktop Study)	
Surface water options	Other potential options
Robertson (After 2020)	
- Further abstraction from the Breede River - Augmentation through the acquisition of additional water from the irrigation sector. - Potential supply from the Greater Brandivlei Dam. - Raising the walls of the existing Dassieshoek Dam to increase the supply yield to Robertson.	- WC/WDM Strategies to reduce losses. - Re-use of water - Groundwater development - Supply from the Keurkloof Dam
McGregor (After 2040)	
- Abstraction from the Keisers River - Abstraction from the Konings River - Abstraction from the Vink River - Supply from the Klipberg Dam	- WC/WDM Strategies to reduce losses. - Groundwater development - Rainwater harvesting
Bonnievale (After 2016)	
- Additional supply from the Zandriff Irrigation Canal. - Pumping water from the Riviersonderend River. - Further abstraction from the Breede River.	- WC/WDM Strategies to reduce losses. - Re-use of water - Rainwater harvesting
Ashton (After 2022)	
- Additional water from the Cogmanskloof Irrigation Scheme. - Further abstraction from the Breede River.	- WC/WDM Strategies to reduce losses. - Re-use of water - Groundwater development of the TMG aquifer.
Montagu (After 2025)	
- Acquiring additional rights from the CBR scheme and additional abstraction from the Breede River via Ashton. - Abstraction from the Keisie and Kingna Rivers.	- WC/WDM Strategies to reduce losses. - Groundwater development - Re-use of water

Yield and quality testing were done during 2017/2018 for six boreholes in Montagu to augment the current surface water sources with groundwater. The abstraction recommendations for these boreholes are included in the table below.

Table C.6.5: Abstraction Recommendations for Montagu Boreholes							
Borehole	Pump Depth (mbgl)	Yield (l/s)	Abstraction duration (hours)	Rest duration (hours)	Maximum water level (mbgl)	Pump Spec Water Level	Possible volume abstracted per day (l)
New BH01	Sand ingress, test had to be stopped						
New BH02	90	2.0	12	12	75	60	86 400
New BH05	90	0.6	18	6	50	30	38 880
Old BH01	125	4.5	16	8	100	80	259 200
Old BH02	115	2.5	14	10	75	50	126 000
Old BH04	115	2.5	14	10	80	65	126 000

The boreholes have been tested individually, not as a well field. Some interconnectivity between the boreholes was recorded at the boreholes near each other. During the testing of Old BH02 drawdown of 5 m was observed at proximal boreholes New BH01 and Old BH01.

If the boreholes are to be used simultaneously, the effect between the boreholes can be compounded. Possible negative effects from this will need to be managed through water level monitoring. Through long term monitoring data, abstraction volumes can also be optimised by adjusting the pumping duration.

The water quality ranges between “ideal” and “dangerous”. Selection of the appropriate boreholes for utilisation will require consideration of quality, and potentially include blending of the different water. The Municipality currently continue with the water quality testing of the boreholes.

To facilitate monitoring and informed management of a borehole, it is highly recommended that a borehole be equipped with the following monitoring infrastructure and equipment:

- Installation of a 32 mm (inner diameter, class 10) observation pipe from the pump depth to the surface, closed at the bottom and slotted for the bottom 5 – 10 m. This allows for a 'window' of access down the borehole which enables manual water level monitoring and can house an electronic water level logger.
- Installation of an electronic water level logger (for automated water level monitoring).
- Installation of a sampling tap (to monitor water quality)
- Installation of a flow volume meter (to monitor abstraction rates and volumes).

The legal compliance regarding the use of the groundwater also needs to be addressed with the DWS.

The DWS also updated their 2010/2011 All Towns Reconciliation Strategies during 2014 and the table below gives an overview of the recommended potential future water resources as included in the updated All Towns Reconciliation Strategies for Langeberg Municipality:

Table C.6.6: Potential Future Water Resources for the Various Towns (DWS's All Towns Reconciliation Strategies)	
Distribution System	Recommended Summary Options
Robertson	The current water supply is expected to meet future water requirements in the low-growth scenario but not in the medium- or high-growth scenarios. The following interventions should be considered and the resource options mentioned below are proposed as potential sources to augment the current water supply (In order of priority and sequence): • Full implementation of the WC/WDM Strategy measures. • Utilise present "leiwater" allocations to domestic use. • Re-use of water • Increased allocation from the Greater Brandvlei Government Water Scheme via the Brandvlei Irrigation Canal.
McGregor	The current water supply will meet the future water requirements, even for the high-growth scenario. The following interventions should be considered for implementation, and the following resource options are proposed as potential sources to augment the current water supply beyond 2040 or if required at an early stage (In order of priority and sequence): • Full implementation of the WC/WDM Strategy. • Incremental groundwater development. • Obtaining water use rights from the various small rivers in proximity of the town. • Rainwater harvesting.
Bonnievale	The current water supply will not meet future water requirements in the low-, medium-and high-growth scenario. The following potential resource interventions should be considered to augment the current water supply (In order of priority and sequence): • Full implementation of the WC/WDM Strategy measures. • Incremental groundwater development. • Additional supply from the Zanddrift irrigation canal. • Re-use of water
Ashton	The current water supply will meet the future water requirements for the low- and medium- growth scenarios if the implementation of the WC/WDM Strategy is successful. The following interventions and resource options are available as potential sources for augmentation (In order of priority and sequence): • Full implementation of the WC/WDM Strategy. • Groundwater development in the TMG Aquifer. • Additional supply from the Kogmanskloof irrigation scheme. • Additional supply from the Breede River.
Montagu	The current water supply is adequate and a shortfall is expected by 2020 for the medium- and high-growth scenarios. The following potential interventions to augment the current water supply should be considered (In order of priority and sequence): • Full implementation of the WC/WDM Strategy measures. • Incremental groundwater development • Re-use of Water • Additional abstraction from the Breede River via Ashton.

Re-use of water is becoming more acceptable and feasible because of increasing water shortages, improved purification technology and decreasing treatment costs. Improvements in membrane technologies and their affordability have made a significant contribution in recent years. At present, up to 14% of water use is reused, mostly through wastewater return flows to rivers from which it is abstracted downstream for indirect re-use.

Re-use of return flows could be significantly increased, particularly in coastal cities where wastewater ordinarily drains into the sea.

The direct re-use of treated wastewater can pose a risk to public health and safety; must be managed carefully and be subject to water quality management and control. Advanced treatment and proper monitoring of all processes and quality of potable water produced is essential. Public perceptions and opinions vary on the topic of water re-use, specifically as it relates to direct potable water re-use. Public perceptions are strongly informed by the general awareness of the poor operation, maintenance, and performance of municipal wastewater treatment plants at present. This poses a significant challenge to building public acceptance of direct water re-use in the current situation. The performance of municipal wastewater and effluent treatment plants nationwide will have to be improved to meet high standards, resulting in consistently good quality discharges to the environment before direct water re-use can be placed on the national water supply agenda.

Metering of all water demand is one of the most significant steps to properly plan and manage water sources. Without metering no management is possible. Langeberg Municipality need to ensure that all the existing bulk water meters are read monthly at least.

Existing Lawful Use: Volumes are registered on the DWS's WARMS for Bonnievale, Ashton and Montagu. A registered water use however does not guarantee that the water use is accurate or lawful. Validation and verification of the accuracy and lawfulness of the water use is needed to qualify as an Existing Lawful Use. **It is important for the municipality to confirm the correct registration volumes and existing lawful use volumes for all their schemes. This information, with the safe yields of the sources, is critical to accurately determine which sources need to be augmented for the different schemes. Langeberg Municipality further needs to ensure that each individual source is metered and that the abstraction volumes are recorded on at least a monthly basis.**

Water Quality: Operational and Compliance Water Quality Monitoring Programmes are implemented by Langeberg Municipality. Operational sampling is done on a frequent basis by the Process Controllers at the various WTWs. The table below gives an overview of the current parameters sampled and the proposed parameters to be sampled:

Table C.6.7: Current Parameters Sampled and Proposed Parameters to be Sampled by the Langeberg Municipality: Routine Monitoring of Process Indicators				
Current / Proposed	Shifts	Sampling point	Frequency of sampling	Current Parameters Sampled
Robertson				
Current	Shift 1: 06:00 – 14:00 Shift 2: 14:00 – 22:00 Shift 3: 22:00 – 06:00	Raw Water	PC per shift	Turbidity, pH, Jar Test (Dependent on quality), Al, Fe, Colour
		Flocculated Water	PC per shift	Turbidity, pH
		Settled Water	PC per shift	Turbidity, pH
		Filtered Water	PC per shift	Turbidity, pH
		Final Water	PC per shift	Turbidity, pH, Free Chlorine, Al, Fe, Colour
		Raw Water	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite, Total Microcystin
		WTW	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine, Giardia Species, Cryptosporidium Species, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite
		Distribution System	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages

Table C.6.7: Current Parameters Sampled and Proposed Parameters to be Sampled by the Langeberg Municipality: Routine Monitoring of Process Indicators				
Current / Proposed	Shifts	Sampling point	Frequency of sampling	Current Parameters Sampled
Proposed	Shift 1: 06:00 – 14:00 Shift 2: 14:00 – 22:00	Raw Water	PC Daily	As currently done + Conductivity or Total Dissolved Solids
		Final Water	PC Daily	Conductivity or Total Dissolved Solids
			PC per shift	As currently done
			PC Weekly	E.Coli and Heterotrophic plate count
	Shift 3: 22:00 – 06:00	Distribution System	PC 14 Days	pH, Turbidity, Free Chlorine, E.Coli and Heterotrophic plate count
			External Lab Monthly	As currently done
McGregor				
Current	Shift: 08:00 – 16:00	Raw Water	PC in morning	Turbidity, pH, Al
		Settled Water	PC in morning	Turbidity, pH
		Filtered Water	PC in morning	Turbidity, pH
		Final Water	PC in morning	Turbidity, pH, Al, Free Chlorine
		Raw Water	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite
		WTW	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine, Giardia Species, Cryptosporidium Species, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite
		Distribution System	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages
Proposed	Shift: 08:00 – 16:00	Raw Water	PC Daily	As currently done + Conductivity or Total Dissolved Solids
		Final Water	PC Daily	Conductivity or Total Dissolved Solids
			PC per shift	As currently done
			PC Weekly	E.Coli and Heterotrophic plate count
		Distribution System	PC 14 Days	pH, Turbidity, Free Chlorine, E.Coli and Heterotrophic plate count
			External Lab Monthly	As currently done
Bonnievale				
Current	Shift 1: 06:00 – 14:00 Shift 2: 14:00 – 22:00 Shift 3: 22:00 – 06:00	Raw Water	PC per shift	Turbidity, pH, Jar Test (Dependent on quality), Fe, Colour, Al, Chlorine
		Final Water	PC per shift	Turbidity, pH, Jar Test (Dependent on quality), Fe, Colour, Al, Chlorine
		Raw Water	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite
		WTW	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine, Giardia Species, Cryptosporidium Species, Manganese, Ammonia Nitrogen,

Table C.6.7: Current Parameters Sampled and Proposed Parameters to be Sampled by the Langeberg Municipality: Routine Monitoring of Process Indicators

Monitoring of Process Indicators				
Current / Proposed	Shifts	Sampling point	Frequency of sampling	Current Parameters Sampled
				Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite
		Distribution System	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages
Proposed	Shift 1: 06:00 – 14:00 Shift 2: 14:00 – 22:00 Shift 3: 22:00 – 06:00	Raw Water	PC Daily	As currently done + Conductivity or Total Dissolved Solids
		Final Water	PC Daily	Conductivity or Total Dissolved Solids
			PC per shift	As currently done
			PC Weekly	E.Coli and Heterotrophic plate count
		Distribution System	PC 14 Days	pH, Turbidity, Free Chlorine, E.Coli and Heterotrophic plate count
			External Lab Monthly	As currently done
Ashton				
Current	Shift 1: 06:00 – 14:00 Shift 2: 14:00 – 22:00 Shift 3: 22:00 – 06:00	Raw Water	PC per shift	Turbidity, pH, Jar Test (Dependent on quality), Al, Fe, Colour
		Flocculated Water	PC per shift	Turbidity, pH
		Settled Water	PC per shift	Turbidity, pH
		Filtered Water	PC per shift	Turbidity, pH
		Final Water	PC per shift	Turbidity, pH, Free Chlorine Residuals, Al, Fe, Colour
		Raw Water	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite, Total Microcystin
		WTW	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine, Giardia Species, Cryptosporidium Species, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite
		Distribution System	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages
Proposed	Shift 1: 06:00 – 14:00 Shift 2: 14:00 – 22:00 Shift 3: 22:00 – 06:00	Raw Water	PC Daily	As currently done + Conductivity or Total Dissolved Solids
		Final Water	PC Daily	Conductivity or Total Dissolved Solids
			PC per shift	As currently done
			PC Weekly	E.Coli and Heterotrophic plate count
		Distribution System	PC 14 Days	pH, Turbidity, Free Chlorine, E.Coli and Heterotrophic plate count
			External Lab Monthly	As currently done
Montagu				
Current	Shift: 08:00 – 16:30	Raw Water	PC at 08:00 and 14:00	Turbidity, pH, Jar Test (Dependent on quality), Al, Fe, Colour
		Settled Water	PC at 08:00 and 14:00	Turbidity, pH
		Filtered Water	PC at 08:00 and 14:00	Turbidity, pH
		Final Water	PC at 08:00 and 14:00	Turbidity, pH, Free Chlorine, Al, Fe, Colour

Table C.6.7: Current Parameters Sampled and Proposed Parameters to be Sampled by the Langeberg Municipality: Routine Monitoring of Process Indicators				
Current / Proposed	Shifts	Sampling point	Frequency of sampling	Current Parameters Sampled
		Ashbury Reservoir	Third Daily	Turbidity, Chlorine
		Raw Water	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite, Total Microcystin
		WTW	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine
			External Lab Quarterly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages, Aluminium, Iron, Monochloramine, Giardia Species, Cryptosporidium Species, Manganese, Ammonia Nitrogen, Chloride, Fluoride, Nitrate & Nitrite Nitrogen, Nitrate, Nitrite, Combined Nitrate plus Nitrite
		Distribution System	External Lab Monthly	pH, Colour, Conductivity, Total Dissolved Solids, Turbidity, Free Chlorine, E.Coli, Heterotrophic Plate Count, Total Coliform Count, Somatic Coliphages
Proposed	Shift: 08:00 – 16:30	Raw Water	PC Daily	As currently done + Conductivity or Total Dissolved Solids
		Final Water	PC Daily	Conductivity or Total Dissolved Solids
			PC per shift	As currently done
			PC Weekly	E.Coli and Heterotrophic plate count
		Distribution System	PC 14 Days	pH, Turbidity, Free Chlorine, E.Coli and Heterotrophic plate count
			External Lab Monthly	As currently done

The operational water sampling programmes of Langeberg Municipality needs to comply with the minimum monitoring requirements of the SANS 241-2:2015 (Table 1: Minimum monitoring for prescribed process risk indicators) for the various WTWs and distribution systems, as summarised below.

Table C.6.8: Minimum Monitoring Frequency for Process Risk Indicators (SANS241-2:2015: Table 1)			
Determinant	Raw Water	Final Water	Distribution System
Conductivity or total dissolved solids	Daily	Daily	Not applicable
pH value	Daily	Once per shift ^a	Fortnightly
Turbidity	Daily	Once per shift ^a	Fortnightly
Disinfectant residuals	Not applicable	Once per shift ^a	Fortnightly
E.Coli (or faecal coliforms) ^b	Not applicable	Weekly	Fortnightly but dependent on population served ^d
Heterotrophic plate count ^c	Not applicable	Weekly	Fortnightly
Treatment chemicals ^d	Not applicable	Monthly	Not applicable
a: A shift is defined as an eight-hour work period.			
b: If non-compliant with the numerical limits specified in SANS 241-1, implement corrective action and immediate follow-up sampling at an increased sampling frequency.			
c: If non-compliant with the numerical limits specified in SANS 241-1, implement corrective action and follow-up sampling.			
d: Includes all risk determinants that are added or formed as a result of the use of treatment chemicals (for example aluminium, iron, and chlorine). If non-compliant with the numerical limits specified in SANS 241-1 in the final water, the distribution system monitoring frequencies of Table 3 in SANS241-2:2015 apply.			

These requirements may be relaxed to a monthly frequency for groundwater supply systems (due to the reduced variability of groundwater quality), provided that no health-related determinants are detected at levels exceeding the numerical limits in SANS 241-1 during the risk assessment.

Effluent Quality: Sampling is done on a frequent basis by the Process Controllers at the various WWTWs. The operational monitoring programme of Langeberg Municipality for their WWTWs is summarised in the table below.

Table C.6.9: Langeberg Municipality's Waste Water Quality Sampling Programme			
WWTW	Position	Frequency	Determinant
Robertson	Aeration Basin	Twice per day	SVI, pH
	Final Effluent	Twice per day	Free Chlorine
McGregor	-	-	-
Bonnievale	Aeration Basin	Once per day	SVI, COD
	Final Effluent	Once per day	Free Chlorine
Ashton	Aeration Basin	Once per day	SVI
	Final Effluent	Once per day	Free Chlorine
Montagu	Aeration Basin	Once per day	SVI, DSVI
	Final Effluent	Once per day	Free Chlorine

The table below gives an overview of the monthly parameters tested at the various WWTWs and the place where the samples are taken.

Table C.6.10: Monthly Effluent Quality Parameters Monitored for Operational and Compliance Monitoring							
Parameter	Robertson, Bonnievale, Ashton and Montagu					McGregor	
	Raw Sewage	Anoxic Tank	Aeration Tank	Settling Tank	Final Effluent	Raw Sewage	Final Effluent
pH (at 25°C) (Field)	X	X	X	X	X	X	X
Settleable Solids (ml/l)			X				
Conductivity (at 25°C) (mS/m)	X				X	X	X
Faecal coliforms (org./100ml)					X		X
Sodium Absorption Ratio							X
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Chemical Oxygen Demand	X			X	X	X	X
Chemical Oxygen Demand (Filtered)			X		X		X
Total Kjeldahl Nitrogen	X						
Ammonia Nitrogen	X		X	X	X	X	X
Nitrate Nitrogen		X	X	X	X		X
Nitrite Nitrogen		X	X	X	X		X
Total Suspended Solids				X	X		X
Volatile Suspended Solids							
Total Phosphate (as P)							
Ortho Phosphate (as P)	X			X	X	X	X
Free Chlorine					X		
Total Chlorine					X		
Dissolved Oxygen		X	X				
Total Alkalinity							
Monochloramine					X		X
Calcium					X		X
Magnesium					X		X
Sodium					X		X

The pH, Conductivity, Faecal Coliforms, COD, Ammonia Nitrogen, Nitrate Nitrogen, Nitrite Nitrogen, Total Suspended Solids, Orthophosphate, Free Chlorine, Total Chlorine, and Nitrite/Nitrate Nitrogen are also tested monthly up-stream and down-stream of the Robertson-, Ashton- and Montagu WWTW.

The Compliance Monitoring Programme consists of monthly sampling of final effluents at the various WWTWs and analyses of all the main quality criteria. Results of the samples taken are loaded onto DWS's IRIS. Monthly monitoring and inspection reports are also compiled by an external Laboratory for all the WWTWs. The Municipality takes immediate action to rectify problems and / or improve operational aspects as and when may be required. For serious failures an Incident Response Management Protocol is followed to ensure rapid remedying of the problems, which includes notification to the DWS as may be necessary.

Operational Alert Levels should also be set by the municipality to ensure that the various unit processes in the plant performs optimally. If these pre-determined Alert Levels are exceeded at any of the control points where samples are taken for operational purposes, then certain actions should be taken to bring the operational parameters back to within the target ranges.

The proposed Operational Alert Levels for the various WWTWs and the corresponding actions that should be taken when these levels are reached or exceeded are included in the table below.

Table C.6.11: Recommended Operational Alert Levels for the Various WWTWs		
Operational Samples	Alert Level	Actions to be taken
Activated Sludge Systems (Recommended)		
Raw Sewage	COD > 1 000 mg/L Ammonia > 100 mg/L as N 5.5 > pH > 9.5 EC > 150 mS/m Settling Solids > 20 mL/L	- Check for possible illegal industrial effluent discharge. - Do more frequent measurements of DO levels, pH and MLSS in the activated sludge reactor.
At outlet of bioreactor	DO < 0.5 mg/L	Increase aeration capacity or cycles.
	MLSS < 2 000 mg/L	Reduce discharge of WAS and allow MLSS levels to increase to 4 000 mg/L.
	MLSS > 6 000 mg/L	Gradually waste more sludge daily to reduce the MLSS to 4 000 mg/L.
	pH < 7.0	- Add lime to the inlet works to maintain the pH in the reactor at 7.0 or slightly above. - Check denitrification process.
Secondary settling tank	COD > 75 mg/L	- Check for sludge carry over from secondary settling tanks. - Check RAS recycle rates. - Check for bulking sludge. - Check for rising sludge. Take action to rectify as appropriate
Oxidation Pond Systems (Recommended)		
Raw Sewage	COD > 1 000 mg/L Ammonia > 100 mg/L as N 5.5 > pH > 9.5 EC > 150 mS/m Settling Solids > 20 mL/L	Check for possible illegal industrial effluent discharge.
Tertiary Pond	COD > 400 mg/L Ammonia > 100 mg/L as N 6 > pH > 9 EC > 200 mS/m SAR > 5 Faecal Coliforms > 100 000 per 100ml	Aerate ponds or provide additional ponds for a total retention period of 25 days.

Industrial Consumers: The quality and volume of industrial effluent discharged by industrial consumers are not yet monitored for all the industrial consumers in Langeberg Municipality's Management Area. Very limited information is known regarding the discharge of effluent by industrial consumers in Langeberg Municipality's Management Area. The following gaps regarding the discharge of industrial effluent were identified.

- All Industrial effluent discharge into the sewer system needs to be metered.
- All persons need to formally apply for the discharge of industrial effluent into the sewer system.
- Regular sampling of the quality of industrial effluent discharged into the sewer system need to be done.
- Any returns from the industries direct to the Water Resource System needs to be metered.

The Municipality needs to adopt an approach whereby the various parameters at all the industrial consumers are monitored, as well as volumetric monitoring at the larger users. Adaptation of procedures must be undertaken in accordance with any changes to the wastewater discharge criteria set by DWS. It will also be necessary to consider limits above which volumetric monitoring will be necessary at new industries and existing smaller industries, where expansion is likely to take place.

All current industrial consumers need to apply for discharge permits and they must supply and maintain a flow meter measuring the volume of water that is discharged into the sewer system. Industrial consumers need to be billed according to the quality of effluent discharged into the Municipality's sewer system. It is also recommended that the accounts generated by the Municipality include for each cycle a summary of the COD and flow results to enable industries to keep a record and look at ways of improving where possible.

TOPIC 7: FINANCIAL

Like other municipalities in South Africa, Langeberg Municipality is also faced with infrastructure backlog that far exceeds the financial means of the municipality. The capital budget, along with the proposed funding mix, remains one of the most important components of the annual budget process, as the municipality is required to strike the perfect balance between eradicating service delivery backlogs on the one hand while still ensuring that the municipality remains financially viable on the other. The capital program of the municipality should never jeopardize the financial sustainability of any municipality, as this will be detrimental to both the municipality as well as the municipal population.

The table below indicates the key financial challenges and interventions of Langeberg Municipality, as included in the 2019/2020 IDP and the 2018/2019 Annual Report.

Table C.7.1: Key Financial Challenges and Interventions		
Key Responsibilities	Challenges	Development Focus
<u>Budget and Support Services</u> : Asset and Stores Management; Auxiliary Services; Financial Statements and Financial Reporting Budgets.	Improving the current turnaround time in populating financial information for financial reporting purposes. Ensuring more effective, efficient, and improved interpretation of financial information, to make informed decisions throughout the financial planning process. Development and implementation of a long term financial plan to ensure long term financial sustainability.	Upgrading of the PROMUN financial system to its full capacity, to timely generate financial information for improved financial reporting. Linking the Stores requisition system to Collaborator for the electronic processing of transactions. Implementing the Municipal Standard Chart of Accounts (MSCOA). Updating the Accounting Policy in the financial statements to ensure consistency with the treatment of capitalized restoration cost.
<u>Income and Expenditure</u> : Income / Revenue; Credit Control; Expenditure and Payroll / Salaries	Debt collection: Outstanding debts of more than 90 days are increasing. The high rate of staff turnover negatively affects productivity. Trained staff is lost – many within a short space of time.	Third Party Vending Project – ongoing Debt collection (long outstanding) by external service provider – ongoing. Investigate the viability of outsourcing external pay points through third party vending in the future. General Valuation.
<u>Supply Chain Management</u> :	Timely processing of requisitions during high volume periods (at the beginning of a financial year and before cut-off date for requisitions). Verification of false information supplied by suppliers.	Updating of the Suppliers Database to ensure that no duplicate suppliers are registered thereon. Ensure implementation of the SCM Policy i.t.o. action taken against suppliers providing false information. Develop staff capacity, to give effect to all Supply Chain Management functions as prescribe in the SCM regulations. Develop efficiency on demand management.

Langeberg Municipality's Strategic Objective 5 is for "Sound Financial Management" and the relevant strategies for this objective are included in Table A.2.5 under the WSA Administration Topic of the "Administration, Information and Comprehensive Overview" WSDP Report. The 2018/2019 Annual Report indicated that the Municipality is of sound financial health.

Expenditure:

Operational: The future planned expenditure by type for Langeberg Municipality, as included in the approved 2023//2024 Budget, is as follows:

Table C.7.2: Expenditure Items by Type, as included in the 2023/2024 Budget					
Expenditure Items	% of total 18/19 Expenditure	2018/2019 Pre-audit Outcome	2020/2021	2021/2022	2022/2023
Employee related costs	27.5%	R189 026 989	R223 216 250	R237 079 600	R262 050 000
Remuneration of Councillors	1.5%	R10 571 398	R11 987 050	R12 736 320	R11 225 000
Debt Impairment	1.4%	R9 765 534	R7 150 560	R7 696 940	R14 747 000
Depreciation and Asset Impairment	4.1%	R27 986 690	R24 598 910	R23 922 040	R39 692 000
Finance Charges	1.7%	R11 524 658	R5 797 070	R5 537 500	R12 153 000
Bulk Purchases	42.2%	R289 862 540	R352 985 440	R372 129 140	R462 247 000
Other Materials	3.4%	R23 347 519	R24 215 020	R25 888 490	-
Contracted Services	7.8%	R53 193 557	R82 942 230	R68 433 440	R56 605 000
Transfers and Grants	1.2%	R8 270 390	R3 718 950	R3 053 320	R3 531 000
Other Expenditure	9.0%	R62 097 797	R57 046 180	R60 918 740	R56 684 000
Loss on disposal of PPE	0.1%	R577 980	-	-	-
Total	100.00%	R686 225 052	R793 657 660	R817 395 530	R918 934 000

Source: 2023/2024 Medium Term Revenue and Expenditure Framework for Langeberg Municipality: Table A4 – Budgeted Financial Performance (Revenue and Expenditure)

Maintenance activities have been increasingly focused on reactive maintenance because 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 Langeberg Municipality to better manage its risks, and more effectively plan and prioritise the wave of renewals that are going to be required over the next 20 years.

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 treatment works. It is estimated that the budget requirements will double over this period.

The recommendations for Langeberg Municipality, regarding their Operational Budgets, are as follows:

- Develop an AMP, 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 must 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.
- It is critical for Langeberg Municipality to ensure that sufficient funding is allocated towards an asset replacement fund, 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 must be allocated to essential water services requirements in the future.

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

Capital: The future estimated capital expenditure per standard classification is summarised in the table below:

Capital Expenditure Standard	2019/2020	2020/2021	2021/2022	2022/2023
Executive and Council	R10 196 000	R2 174 000	R3 044 000	R605 000
Budget and Treasury Office	R3 040 000	-	-	-
Corporate Services	-	-	-	-
Community and Social Services	R945 000	-	-	R2 144 000
Sport and recreation	R2 715 000	R3 451 000	R3 672 000	R5 208 000
Public Safety	R506 000	R120 000	-	R10 432 000
Housing	-	-	-	R261 000
Health	-	-	-	-
Planning and Development	R4 500 000	R3 500 000	R3 500 000	R3 605 000
Road Transport	R30 591 000	R12 400 000	-	R47 640 000
Environmental Protection	-	-	-	-
Electricity	R36 021 000	R12 375 000	R10 060 000	R13 304 000
Water	R2 500 000	R1 300 000	R20 810 000	R15 381 000
Waste Water Management	R1 120 000	R9 677 000	-	R23 190 000
Waste Management	R3 300 000	R2 120 000	-	R22 979 000
Total Capital Expenditure	R95 434 000	R47 117 000	R41 086 000	R144 749 000

Source: 2023/24 Medium Term Revenue and Expenditure Framework for Langeberg Municipality: Table A5 - Capital Expenditure byVote, Standard Classification and Funding

The opening costs of the water infrastructure that is expected to come to the end of its useful life over the next 20 years is R50.427 million (an average of R2.521 million per year) and for sewerage infrastructure the value is R51.638 million (an average of R2.581 million per year). The renewals burden is set to increase sharply over the next 20 years. Water and sewerage infrastructure assets with a total opening cost value of about R20.438 million and R16.790 million will be reaching the end of their useful lives over the first 10 years and will need to be replaced, rehabilitated, or reconstructed. In the following 10 years the amounts are estimated to be R29.989 million and R34.848 million.

The extent to which each type of water and sewerage asset portfolio has been consumed are summarised in Topic 3 in the Tables under Section 3.1.1 of the Administration, Information and Comprehensive Overview WSDP Report. The infrastructure components with low percentage figures (% Book Values/Opening Costs) need dedicated renewals programmes targeting these assets. If this is not done, there is the risk that the on-going deterioration will escalate to uncontrolled proportions, with considerable impact on consumers, the economy of the area and the image of Langeberg Municipality.

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.

The recommendations for Langeberg Municipality, regarding their Capital Funding, 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 WC/WDM Strategy 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.
- To focus strongly on revenue collection, to improve the Municipality's own funding sources, over and above the Grants received from National and Provincial Government. The Municipality also needs to actively implement their Credit Control and Debt Collection Policy to minimize the percentage of non-payment for municipal services.
- To identify all possible sources of external funding over the next three years to assist Langeberg Municipality to address the bulk infrastructure backlogs that exist in the various towns as indicated in the tables under Topic 3 of the Future Demand and Functionality Requirements WSDP Report.
- 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 Langeberg Municipality to commit to a substantial and sustained programme of capital renewal works. The current level of expenditure on capital renewal is inadequate and there is a critical need for Council to commit to increase the budget for the maintenance and rehabilitation of the existing infrastructure substantially.

Income:

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.

Operational: The future planned revenue by source for Langeberg Municipality, as included in the 2023/2024 Budget, is as follows:

Table C.7.4: Revenue Items by Source, as Included in the 2023/2024 Budget					
Revenue Item	% of total 18/19 Income	2018/2019 Pre-audit Outcome	2020/2021	2021/2022	2022/2023
Property Rates	7.9%	R52 863 000	R62 250 000	R67 541 000	R96 933 000
Service Charges - Electricity	55.7%	R371 654 000	R461 384 000	R493 681 000	R566 352 000
Service Charges - Water	6.8%	R45 612 000	R51 972 000	R56 130 000	R65 064 000
Service Charges - Sanitation	3.5%	R23 307 000	R26 452 000	R28 701 000	R33 901 000
Service Charges - Refuse	3.0%	R20 210 000	R25 552 000	R28 618 000	R30 584 000
Rental of facilities and equipment	0.7%	R4 748 000	R3 542 000	R3 790 000	R2 641 000
Interest earned - external investments	1.2%	R7 712 000	R10 158 000	R10 869 000	R15 444 000
Interest earned - outstanding debtors	0.4%	R2 682 000	R3 345 000	R3 580 000	R3 450 000
Dividends received	0.0%	0	0	0	0
Fines, penalties, and forfeits	0.8%	R5 411 000	R4 301 000	R4 602 000	R4 492 000
Licences and permits	0.2%	R1 328 000	R1 127 000	R1 206 000	R803 000
Agency services	0.9%	R5 680 000	R5 597 000	R5 989 000	R6 101 000
Transfers and subsidies	16.7%	R111 268 000	R136 813 000	R134 164 000	R147 052 000
Other revenue	2.0%	R13 602 000	R12 369 000	R13 235 000	R6 230 000
Gains on disposal of PPE	0.2%	R1 395 000	R1 597 000	R1 709 000	-
Total	100.00%	R667 471 000	R806 459 000	R853 814 000	R979 047 000

Source: 2023/2024 Medium Term Revenue and Expenditure Framework for Langeberg Municipality: Table A4 – Budgeted Financial Performance (Revenue and Expenditure)

Capital: The Capital Budget of Langeberg Municipality for the last number of financial years were roughly between R50 million and R100 million per year. Capital funding will have to increase substantially if existing service levels are to be sustained, which must be the goal. In this regard Langeberg Municipality's own funding, as well as the MIG funding must significantly exceed inflation. Other possible sources of funding and innovative funding mechanisms must be explored.

It is important for Langeberg Municipality to manage their charges for water and sanitation services and the control of consumer payments effectively, to ensure that adequate income is generated to fund their water and sewerage capital projects. The future funding sources of Langeberg Municipality's total capital budget are summarised in the table below:

Table C.7.5: Sources of Funding for the Future Capital Budgets of Langeberg Municipality				
Capital Funding Source	2019/2020	2020/2021	2021/2022	2022/2023
National Government	R32 159 000	R26 529 000	R28 681 000	R43 251 000
Provincial Government	R0	R0	R0	R5 253 000
District Municipality	R500 000	R0	R0	R240 000
Other transfers and grants	R0	R0	R0	R0
Borrowing	R27 088 000	R0	R0	R47 800 000
Internally generated funds	R35 687 000	R20 588 000	R12 405 000	R59 543 000
Total Capital Funding	R95 434 000	R47 117 000	R41 086 000	R156 086 000

Source: Budget MTREF 2023/2024 – 2025/2026

Tariff and Charges: The state of the economy has an adverse effect on the consumers. As a result, municipalities' revenues and cash flows are expected to remain under pressure. Furthermore, municipalities should carefully consider affordability of tariff increases, especially as it relates to domestic consumers while considering the level of services versus the associated cost. Water tariffs should always be cost reflective and the water tariff structure must therefore ensure that:

- Water tariffs are fully cost-reflective, including the cost of maintenance and renewal of purification plants, water networks and the cost associated with reticulation expansion;
- Water tariffs are structured to protect basic levels of service and ensure the provision of free water to the poorest of the poor (indigent); and
- Water tariffs are designed to encourage efficient and sustainable consumption.

Langeberg Municipality's current six 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 higherconsumption blocks. The first 6 kl of water is provided free to residential consumers who qualify for indigent relief. 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 must be optimally managed. The increase in the price of electricity and chemicals for purification has contributed to the cost of delivering the service.

Special drought tariffs (Phase 1, Phase 2, and Phase 3) are also in place. The table below gives some comments on the specific blocks, regarding Langeberg Municipality's block step tariff structure, for the various years for water services.

Table C.7.6: Comments on the Municipality's Block Step Water Tariff Structure					
Block (kl/month)	2019/2020	2020/2021	2021/2022	2022/2023	Comments
0 - 6	R2-49	R2-58	R2-58	R2-67	Free Basic Water
7 - 15	R5-91	R6-18	R6-18	R6-46	Low volume use
16 - 30	R6-30	R6-66	R6-66	R7-04	Typical use volume, including garden irrigation
31 - 40	R6-75	R7-20	R7-20	R7-70	Above average use, including garden irrigation
41 - 60	R8-82	R9-51	R9-51	R10-28	
61 - 100	R9-40	R10-24	R10-24	R11-18	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 Langeberg Municipality's Structure to ensure efficient water use (WDM Strategy):

- 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. Six blocks in a tariff often make good sense, as indicated in Table 7.3.1.
- The volumetric steps should be kept the same for all the areas within Langeberg Municipality's Management Area.
- The cost of water in the maximum step should severely discourage use in this category. The volumetric use for the highest category could be 60 kl/month, above which residential water use could be wasteful or unnecessary. Garden use requiring more than this volume should be reduced in accordance with xeriscape practices.

The MFMA Circular No.78 of 7 December 2015 stipulated the following w.r.t. the water and sanitation tariff increases:

Municipalities should consider the full cost of rendering the water and sanitation services when determining tariffs related to these two services. If the tariffs are low and result in the municipality not recovering their full costs, the municipality should develop a pricing strategy to phase-in the necessary tariff increases in a manner that spreads the impact on consumers over a period.

Municipalities are urged to design an Inclining Block Tariff structure that is appropriate to its specific circumstances, and ensures an appropriate balance between low-income consumers and other domestic, commercial, and business customers, and the financial interests of the municipality. While considering this structure, municipalities are advised to evaluate if the IBT system will be beneficial to them depending on consumption patterns in their areas.

Considering the current drought being experienced across large parts of the country, and to mitigate the need for water tariff increases, municipalities must put in place appropriate strategies to limit water losses to acceptable levels. In this regard municipalities must ensure that water used by its own operations is charged to the relevant service, and not simply attributed to water losses.

The recommendations for the water and sewerage tariffs of Langeberg Municipality are as follows:

- Langeberg Municipality can investigate the financial viability of changing the sanitation tariff structure from a fixed monthly amount, which is also not based on the number of toilet pans, to a stepped tariff based on water consumption in the future. Volumetric usage for sanitation services, whereby charges are determined according to water usage, with maximum ceilings and charged accordingly. This will need to include a free sanitation bracket, similar for free water. This will also further deter wasteful water use.
- Langeberg 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 and to ensure that all the O&M expenditure for water and sanitation services are recovered through their water and sanitation services income, 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.
- The large commercial and industrial consumers could lower their current water demand by means of improved practices or re-use of waste water. Langeberg Municipality should note that revenue could potentially decrease because of reuse practices.
- Langeberg Municipality needs to start with the monitoring of the volume and nutrient loading of all industrial effluent discharged by industrial consumers into the sewer system. A formula for the calculation of the extraordinary treatment cost to industrial consumers for the industrial effluent they discharged into Langeberg Municipality's sewer system needs to be put in place to form part of the existing tariff structure. The performance of WWTWs in general can be severely compromised by certain industrial effluent discharges. It is therefore also important for Langeberg Municipality to recalculate their treatment costs annually, to ensure that there is no under or over recovery of costs from industrial consumers. The charges for wastewater discharged by industrial consumers can also be linked to their water usage in the future.

Regular sampling of the quality of industrial effluent discharged into the sewer system needs to be done and all industrial consumers need to be charged according to the quality of the effluent discharged into the Municipality's sewer system.

- The current water tariff codes adequately differentiate between the different type of consumers and their water usage. The Municipality can investigate the possibility to uniquely describe the "Departmental" water usage with a distinction between the different user types, for example parks, office usage, fire-fighting, etc.

TOPIC 8: WATER SERVICES INSTITUTIONAL ARRANGEMENTS AND CUSTOMER CARE

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 developed a new WSDP website to assist WSAs with the WSDP process and to provide a framework for the capturing of the data. The WSDP of Langeberg Municipality needs to be updated regularly.

The Municipality needs to continue to draft annually a WSDP Performance and Water Services Audit Report, as required in terms of Section 18 of the Water Services Act, 1997 (Act No.108 of 1997), as well as the "Regulations relating to compulsory national standards and measures to conserve water", as issued in terms of Sections 9(1) and 73(1)(j) of the Water Services Act.

The Water Safety Plan for the various WTWs and water distribution systems and the W₂RAP for the WWTWs and drainage networks need to be updated regularly. Detail WTW and WWTW Process Audits also needs to be done regularly.

The Water and Sewer Master Plans of Langeberg Municipality (March 2012) summarise the projects (Master Plan Items) necessary to cope with the increased future demands and developments within the Langeberg Municipality's systems. The Water and Sewer Master Plans need to be updated regularly.

A Work Place Skills Plan is in place for Langeberg Municipality, which lists the training to be provided during the new financial year. The training of Langeberg Municipality's personnel involved in the management of water and sanitation services are the most important factors that determine the ability of Langeberg Municipality to deliver safe and reliable water and to treat the effluent at the WWTWs to an acceptable standard. Training of all staff involved in water supply and sanitation services on matters related to treatment processes and quality monitoring and control is essential because their actions (or failure to act) will have a major impact on the well-being of the communities and the environment.

Langeberg Municipality can also start to actively focus on in-house training, which requires the identification of trainers (from senior operators / officers / professional ranks) for the development and facilitation of courses which relate to specific organizational knowledge and systems requirements. Langeberg Municipality's internal reports such as the Water Safety Plan, W₂RAP, Operation and Maintenance Manuals and this WSDP have the necessary information on which the in-house courses can be based. This will assist Langeberg Municipality's Human Resource Department in general and the skills development facilitator to develop and implement effective workplace skills plans relevant to Human Capacity Development requirements.

It is important for Langeberg Municipality to classify all 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.

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

The required Director positions are filled and Performance Agreements are signed with these Directors annually. All critical water vacant positions as indicated on the approved Organogram needs to be filled as soon as possible. Langeberg Municipality needs to review the skills needed at each of the WTWs and WWTWs according to the classification of the plants and need to align resources to these needs as well as reviewing 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.

Langeberg Municipality has a comprehensive Performance Management System in place. The performance indicators as included in the SDBIP are regularly reviewed to promote a culture of performance management among its political structures, political office bearers and councillors and in its administration and administer its affairs in an economical, effective, efficient, and accountable manner.

A Water Bylaw and Sewerage and Sanitation Services Bylaw are in place. Langeberg Municipality needs to continue to put the required mechanisms in place to ensure compliance with the Bylaws.

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

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

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

Three other important barriers implemented by Langeberg Municipality against poor quality drinking water that are a prerequisite to those listed above are as follows:

- A well-informed Council and top management that understands 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 and lead by example and are passionate about monitoring and safeguarding drinking water quality.
- Well informed community members and other consumers of water supply services that have respect for water as a precious resource.

A Client Services Charter is in place for Langeberg Municipality. The Client Services Charter should include the following:

- Commitment to deliver excellent services to the clients (Executive Mayor and Municipal Manager).
- Standards of services (Enquiries written and telephonic; Accounts enquiries and distribution of accounts).
- Response times for different services (Water: Repairs to networks, installation of new household water connections, etc.)
- Contact details for different areas.

Langeberg Municipality is committed to maintain the existing high level 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 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 required time.

SECTION D: WATER SERVICES OBJECTIVES AND STRATEGIES

The water services strategies presented below were derived from the 2019/2020 Top Layer SDBIP and the water services situational analysis as summarized in Section C: Water Services Existing Needs Perspective and presents the 5-year Water Services strategies as established in the WSA's WSDP:

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Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Topic 1: Settlement Demographics and Public Amenities							
Topic 2: Service Levels Profile							
SO2: Basic Service Delivery	Number of formal residential properties that receive piped water that is connected to the municipal water infrastructure network and which are billed for water or have pre-paid meters as at 30 June 2020 (TL55)	14 500	14 142	14 500	14 500	14 500	14 500
SO2: Basic Service Delivery	Number of formal residential properties connected to the municipal waste water sanitation / sewerage network for sewerage service, irrespective of the number of water closets (toilets) and which are billed for sanitation / sewerage as at 30 June 2020 (TL57).	14 500	14 619	14 500	14 500	14 500	14 500
SO2: Basic Service Delivery	Provide free basic water to indigent households as at 30 June 2023 (TL59)	6 000	6 665	6 000	6 000	6 000	7 000
SO2: Basic Service Delivery	Provide free basic sanitation to indigent households as at 30 June 2023 (TL61)	6 800	6 828	6 800	6 800	6 800	6 800
SO2: Basic Service Delivery	100% Spend of the total amount budgeted for new connections by 30 June (TL27).	100%	80.59%	-	-	-	-
SO2: Basic Service Delivery	Spend 100% of total amount budgeted for ablution facilities at Mandela square by December 2018 (TL83).	100%	98.45%	-	-	-	-
Ensure all households on the farms are provided with at least basic water services, subject to DWS guidance.	Support all applications received for basic water services on the farms (Subject to availability of financial resources and sustainability of type of service) (New).	-	-	-	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)
Ensure all households on the farms are provided with at least basic sanitation services, subject to DWS guidance.	Support all applications received for basic sanitation services on the farms (Subject to availability of financial resources and sustainability of type of service) (New).	-	-	-	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)
Provision of water to informal households based on the standard of 1 water point to 25 households.	Number of communal taps installed in relation to the number of informal households (New).	-	-	-	Provide at least 1 water point to every 25 households in informal areas	Provide at least 1 water point to every 25 households in informal areas	Provide at least 1 water point to every 25 households in informal areas
Provision of sanitation service to informal households based on the standard of 1 toilet to 5 households.	Number of toilet structures provided in relation to the number of informal households (New).	-	-	-	Provide at least 1 toilet to every 5 households in informal areas.	Provide at least 1 toilet to every 5 households in informal areas.	Provide at least 1 toilet to every 5 households in informal areas.
Topic 3: Water Services Asset Management							
SO2: Basic Service Delivery	Spend 100% of the total amount budgeted for installation of bulk services by 30 June 2019 (TL50).	100%	84.68%	-	-	-	-

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Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
SO2: Basic Service Delivery	% of recommendations as included in the Improvement / Upgrade Plan of the Water Safety Plan and the detail WTW Process Audits implemented (New).	-	-	-	40% of recommendations implemented	60% of recommendations implemented	80% of recommendations implemented
SO2: Basic Service Delivery	% of recommendations as included in the Improvement / Upgrade Plan of the W ₂ RAP and the detail WWTW Process Audits implemented (New).	-	-	-	40% of recommendations implemented	60% of recommendations implemented	80% of recommendations implemented
SO2: Basic Service Delivery	Ensure adequate storage capacity for all towns (At least 48hrs AADD) (New).	-	-	-	All areas with an overall storage capacity above 48hrs AADD.	All areas with an overall storage capacity above 48hrs AADD.	All areas with an overall storage capacity above 48hrs AADD.
SO2: Basic Service Delivery	Ensure adequate water pump station and water reticulation capacity (New).	-	-	-	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.
SO2: Basic Service Delivery	Ensure adequate sewer pump station and drainage network capacity (New).	-	-	-	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.
SO2: Basic Service Delivery	Ensure all water and sewerage infrastructure assets are included in the Asset Register, with accurate CRC, DRC, RUL and Age (New).	-	-	-	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 Age in the Asset Register is 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 Age in the Asset Register is 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 Age in the Asset Register is not correct.
SO2: Basic Service Delivery	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 (New).	-	-	-	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.
Topic 4: Water Services Operation and Maintenance							
SO2: Basic Service Delivery	Spend 100% of the total amount budgeted for the purchase of water testing equipment by 30 June 2019 (TL26).	100%	63.51%	-	-	-	-

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Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Ensure adequate O&M	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 (New).	-	-	-	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.
Reporting on water quality and final effluent quality compliance percentages.	Report at least annually to the public on the percentage of water quality and final effluent quality compliance (New).	-	-	-	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.
Topic 5: Conservation and Demand Management: Water Resource Management							
SO2: Basic Service Delivery	Limit unaccounted water to less than 15% as at 30 June 2020 (TL18).	15%	15.95%	15%	15%	15%	15%
Topic 5: Conservation and Demand Management: Water Balance							
SO2: Basic Service Delivery	Spend 100% of the total amount budgeted for the replacement of pre-paid meters by 30 June 2019 (TL33)	100%	100%	-	-	-	-
SO2: Basic Service Delivery	Ensure all bulk water is metered at source, at WTW (incoming and outgoing) and at bulk storage reservoirs and the meters are read and recorded on at least a monthly basis (New).	-	-	-	85% of all sources metered and bulk water meters read and recorded at least monthly.	90% of all sources metered and bulk water meters read and recorded at least monthly.	100% of all sources metered and bulk water meters read and recorded at least monthly.
SO2: Basic Service Delivery	Ensure all incoming and outgoing flows at the WWTWs are metered, as well as final effluent re-used for irrigation purposes and that meters are read and recorded on at least a monthly basis (New).	-	-	-	85% of all flows at WWTWs metered and meters read and recorded at least monthly.	90% of all flows at WWTWs metered and meters read and recorded at least monthly.	100% of all flows at WWTWs metered and meters read and recorded at least monthly.
Topic 6: Water Resources							
SO2: Basic Service Delivery	95% of water samples comply with SANS241 micro biological indicators (TL16).	95%	98.33%	95%	95%	95%	95%
SO2: Basic Service Delivery	80% of effluent samples comply with permit values (TL23).	80%	82.65%	80%	80%	80%	80%
SO2: Basic Service Delivery	Spend 100% of the amount budgeted for the establishment of boreholes by 30 June 2019 (TL81).	100%	99.68%	-	-	-	-
SO2: Basic Service Delivery	% Of abstraction from sources registered and authorized by the DWS (New).	-	-	-	60% Compliance	80% Compliance	95% Compliance
SO2: Basic Service Delivery	% Monitoring of effluent discharged by industrial consumers (Quantity and Quality) (New)	-	-	-	40% of all industrial consumers monitored w.r.t. quality and quantity of effluent discharged by them.	60% of all industrial consumers monitored w.r.t. quality and quantity of effluent discharged by them.	80% of all industrial consumers monitored w.r.t. quality and quantity of effluent discharged by them.
Topic 7: Financial							
SO5: Sound Financial Management	Spend 95% of the total amount budgeted for the upgrading of filters in Montagu WTW by 30 June 2020 (TL25).	95%	-	95%	-	-	-

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Table D.1: Water Services Objectives and Strategies							
Objective / Strategy	Key Performance Indicator	Baseline	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
SO5: Sound Financial Management	Spend 95% of the total amount budgeted for the installation of basic services (water) for informal settlements by 30 June 2020 (TL42).	95%	-	95%	-	-	-
SO5: Sound Financial Management	Spend 95% of the total amount budgeted for the upgrading of Muiskraalkop sewerage outflow by 30 June 2020 (TL46).	95%	-	95%	-	-	-
SO5: Sound Financial Management	Financial viability measured in terms of the municipality's ability to meet its service debt obligations as at 30 June 2020 (TL63).	5%	2.2%	5%	5%	5%	5%
SO5: Sound Financial Management	Financial viability measured in terms of the outstanding service debtors as at 30 June 2020 (TL64).	12.0%	9.83%	12.0%	12.0%	12.0%	12.0%
SO5: Sound Financial Management	Financial viability measured in terms of the available cash to cover fixed operating expenditure as at 30 June 2020 (TL65).	2.20	2.80	2.20	2.20	2.20	2.20
SO5: Sound Financial Management	Achieve a debtors payment percentage of at least 98% by 30 June 2020 (TL68).	98%	93%	98%	98%	98%	98%
Topic 8: Institutional and Customer Care							
SO4 "A responsive and accountable administration"	Report on the implementation of the WSDP annually by the end of October. Report submitted to Council and DWS (New).	1	-	-	1	1	1

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 financial years. Table E.2a provides the projects identified for implementation in FY2021/22, Table E.2b provides the projects identified for implementation in FY2022/23 and Table E.2c provides the projects identified for implementation in FY2023/24.

It should be highlighted that the projects included herein, represents only projects for which funding has already been secured, and therefore does not comprise the comprehensive water services project requirements of Langeberg Municipality.

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Table E2.a: Water services MTEF Projects 2021/22

Vote number	Project	SOURCE	Annual / Adjusted Budget	Expenditure for the Month	Year to Date Actual	Orders	Total Expenditure	Total Expenditure vs Budget	Balance	Planned YTD Expenditure (i.t.o. SDBIP Cashflows)	Actual Expenditure vs Budget
9/120-52101-106	Office Furniture & Equipment	All	200 000.00	4 050.00	198 688.24	0.00	198 688.24	99.34%	1 311.76	100.00%	99.34%
9/146-22901-150	Upgrading filters in Montagu WTW		4 070 000.00	0.00	4 077 446.00	0.00	4 077 446.00	100.18%	-7 446.00	100.00%	100.18%
9/134-32701-371	New Reservoir Robertson Heights	WSIG	14 091 304.00	4 066 429.39	7 254 231.73	5 951 549.54	13 205 781.27	93.72%	885 522.73	100.00%	51.48%
9/133-33125-372	Install New Pipeline Reservoir Robertson Heights	WSIG	1 300 000.00	0.00	1 300 000.00	0.00	1 300 000.00	100.00%	0.00	100.00%	100.00%
9/146-22804-373	Upgrade Pumpstation Waterworks Robertson	WSIG	2 000 000.00	0.00	2 000 000.00	0.00	2 000 000.00	100.00%	0.00	100.00%	100.00%
9/133-13111-303	Water network - Zolani - CRR	CRR	118 594.00	0.00	118 594.00	0.00	118 594.00	100.00%	0.00	100.00%	100.00%
9/133-13113-306	CRR: Rehabilitate Water Networks Ph 4 - Robertson	CRR	371 051.00	0.00	371 051.00	0.00	371 051.00	100.00%	0.00	100.00%	100.00%
9/133-13117-311	CRR: Rehabilitate Water Networks Ph 4 - Montagu	CRR	198 226.00	0.00	182 819.58	0.00	182 819.58	92.23%	15 406.42	100.00%	92.23%
9/133-13115-308	CRR: Rehabilitate Water Networks Ph 4 - Bonnievale	CRR	337 996.00	0.00	337 996.00	0.00	337 996.00	100.00%	0.00	100.00%	100.00%
9/133-53821-312	Equipment	CRR	120 000.00	31 716.85	101 019.58	10 370.88	111 390.46	92.83%	8 609.54	100.00%	84.18%
9/133-33023-353	WSIG Mandela Square Montagu - Install water main	WSIG	2 967 574.00	2 344 532.53	2 579 846.25	112 408.78	2 692 255.03	90.72%	275 318.97	100.00%	86.93%
9/133-33024-354	WSIG Boekenhoutsloof Bonnievale - Install water main	WSIG	3 195 850.00	2 253 023.58	2 253 023.58	525 976.42	2 779 000.00	86.96%	416 850.00	100.00%	70.50%
9/146-32905-383	Walkway at filters Bonnievale WTW (H S)	CRR	100 000.00	0.00	0.00	0.00	0.00	0.00%	100 000.00	100.00%	0.00%
9/133-53926-384	1 x 1600 LDV	CRR	190 000.00	0.00	0.00	0.00	0.00	0.00%	190 000.00	100.00%	0.00%
9/134-32702-396	New Reservoir Robertson Heights - CRR	CRR	5 415 000.00	0.00	0.00	5 415 000.00	5 415 000.00	100.00%	0.00	0.00%	0.00%
Total Water			34 475 595.00	8 695 702.35	20 576 027.72	12 015 305.62	32 591 333.34	95%	1 884 261.66	87%	60%
Sewerage											
9/140-53915-365	New Sewer Truck		1 112 065.00	0.00	1 112 063.00	0.00	1 112 063.00	100.00%	2.00	100.00%	100.00%
9/141-33501-374	New Telemetry System Bvale Sewerage Pumpstation		2 400 000.00	64 497.00	388 932.00	283 038.00	671 970.00	28.00%	1 728 030.00	100.00%	16.21%
9/140-53812-313	Equipment		120 000.00	0.00	32 502.30	27 440.83	59 943.13	49.95%	60 056.87	100.00%	27.09%
9/140-33613-355	WSIG Mandela Square Montagu - Construct Install sewer pump line		6 060 315.00	0.00	5 514 556.84	0.00	5 514 556.84	90.99%	545 758.16	100.00%	90.99%
9/140-33614-356	WSIG Boekenhoutsloof Bonnievale - Construct Install sewer pump line		6 118 000.00	5 579 831.23	6 012 830.02	0.00	6 012 830.02	98.28%	105 169.98	100.00%	98.28%
9/140-33613-385	WSIG Mandela Square Montagu - Construct Install sewer pump line		50 000.00	49 844.73	49 844.73	1 330.43	51 175.16	102.35%	-1 175.16	100.00%	99.69%
9/140-33614-386	WSIG Boekenhoutsloof Bonnievale - Construct Install sewer pump line		120 000.00	27 535.12	27 535.12	28 400.20	55 935.32	46.61%	64 064.68	100.00%	22.95%
9/140-33515-387	Stairs at Avalon Springs sewer pump station (H S)		20 000.00	9 836.11	9 836.11	0.00	9 836.11	49.18%	10 163.89	100.00%	49.18%
Total Sewerage			16 000 380.00	5 731 544.19	13 148 100.12	340 209.46	13 488 309.58	84%	2 512 070.42	100%	82%

Table E.2b: Water Services MTEF Projects - FY2022/23 (2nd year MTEF period)

Vote number	Vote Description	SOURCE	ORG Budget 2022/2023	ADJ Budget 2022/2023	Expenditure for the Month	Year to Date Actual	Orders	Total Expenditure	Total Expenditure vs Budget	Balance
Total Dir Engineering Services			-	-	-	-	-	-	-	-
Water										
9/134-32701-371	New Reservoir Robertson Heights	WSIG	-	6 837 072.00	363 664.84	6 837 071.99	-	6 837 071.99	100%	0.01
9/134-32702-396	New Reservoir Robertson Heights - CRR	CRR	-	7 768 340.00	2 071 156.61	7 621 098.01	2 204.50	7 623 302.51	98%	145 037.49
9/133-53926-384	1 x 1600 LDV	CRR	-	132 779.00	-	132 778.67	-	132 778.67	100%	0.33
9/133-53927-385	2L LDV	EFF	-	642 488.00	642 488.00	642 488.00	642 488.00	1 284 976.00	200%	-642 488.00
Total Water			-	15 380 679.00	3 077 309.45	15 233 436.67	644 692.50	15 878 129.17	103%	497 450.17
Sewerage										
9/140-53812-313	Equipment	CRR	-	590 773.00	334 595.30	390 710.08	200 062.93	590 773.01	100%	-0.01
9/141-33501-374	New Telemetry System Bvale Sewerage Pumpstation	CRR	-	1 585 106.00	-	500 689.17	1 130 306.96	1 630 996.13	103%	-45 890.13
9/140-23708-179	Upg Robertson WWTW - MIG	MIG	11 978 814.00	7 850 845.00	-	7 850 845.00	-	7 850 845.00	100%	-
9/140-23709-197	Upg Robertson WWTW - CRR	CRR	10 000 000.00	10 000 000.00	4 477 737.42	9 999 689.74	-	9 999 689.74	100%	310.26
9/140-53915-388	Sewer Removal Truck	EFF	-	1 182 043.00	1 182 043.00	1 182 043.00	1 165 571.74	2 347 614.74	199%	-1 165 571.74
9/140-33614-356	WSIG Boekenhoutsloof Bonnievale - Construct Install sewer pump line	WSIG	-	1 981 482.00	136 786.84	728 240.92	48 833.40	777 074.32	39%	1 204 407.68
Total Sewerage			-	21 978 814.00	23 190 249.00	6 131 162.56	20 652 217.91	2 544 775.03	100%	6 743.94

WSDP-IDP WATER SECTOR INPUT REPORT

Table E.2c: Water Services MTEF Projects - FY2023/24 (3rd year MTEF period)

Vote number	Vote Description	SOURCE	ORG Budget 2023/2024	February ADJ Budget 2023/2024	Expenditure for the Month	Year to Date Actual	Orders	Total Expenditure	Total Expenditure vs Budget	Balance
Water										
9/133-33150-230	Montagu reservoir	CRR	150 000.00	150 000.00	-	-	-	-	0%	150 000.00
9/133-33126-373	Breede river pumps	CRR	-	450 441.00	-	-	-	-	0%	450 441.00
9/133-53825-313	Breede River Pumpstation	MDRG	-	478 261.00	-	-	-	-	0%	478 261.00
9/133-33151-231	Generators for WTW and pumps	CRR	8 957 000.00	5 368 793.00	687 928.67	2 215 819.62	2 444 890.84	4 660 710.46	87%	708 082.54
9/133-33152-232	Water Pipe Replacement	CRR	2 000 000.00	2 000 000.00	-	5 694.00	-	5 694.00	0%	1 994 306.00
9/133-53821-312	Equipment	CRR	180 000.00	180 000.00	-	39 666.03	915.66	40 581.69	23%	139 418.31
	Total Water		11 287 000.00	8 627 495.00	687 928.67	2 261 179.65	2 445 806.50	4 706 986.15	55%	3 920 508.85
Sewerage										
9/140-53812-313	Equipment	CRR	120 000.00	378 742.00	2 992.70	7 401.40	266 843.70	274 245.10	72%	104 496.90
9/140-53815-373	Generators WWTW and sewer pump stations	CRR	-	588 207.00	-	-	-	-	0%	588 207.00
9/140-53918-375	McGregor Sewer Plant Repair (Flood Damage)	CRR	-	491 304.00	-	-	-	-	0%	491 304.00
9/140-53818-380	McGregor Sewer Plant Repair (Flood Damage)-MDRG	MDRG	-	2 608 696.00	-	-	-	-	0%	2 608 696.00
9/140-53818-381	Pumpstation-Montagu	MDRG	-	937 000.00	-	-	-	-	0%	937 000.00
9/140-53818-382	Pumpstation-Avalon Springs	MDRG	-	240 000.00	-	-	-	-	0%	240 000.00
9/140-53818-383	Ashton Train Bridge Pumpstation and fencing	MDRG	-	1 304 348.00	-	-	-	-	0%	1 304 348.00
9/140-53818-384	Bulk Sewer-Montagu	MDRG	-	86 860.00	-	-	-	-	0%	86 860.00
9/140-53917-370	Construction and alterations to the sewer networks in Hospital Street, Robertson	CRR	250 000.00	250 000.00	-	-	-	-	0%	250 000.00
9/141-33501-374	New Telemetry System Bvalse Sewerage Pumpstation	CRR	-	1 344 706.00	-	718 220.22	88 242.22	806 462.44	60%	538 243.56
9/140-23708-179	Upg Robertson WWTW - MIG	MIG	22 202 607.00	20 717 391.00	-	18 989 067.99	2 739 424.41	21 728 492.40	105%	-1 011 101.40
9/140-23709-197	Upg Robertson WWTW - CRR	CRR	6 956 521.00	7 809 351.00	-	143 624.13	6 049 148.70	6 192 772.83	79%	1 616 578.17

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. Master Planning is typically based on a forward planning horizon of 20 years, but is usually updated every three to five years, considering improved water demand estimates and subsequent infrastructure developments which may have taken place. The recommended projects from the 2012 Langeberg Master Plans were incorporated into the WSDP. **The Water and Sewer Master Plans need to be updated. The update is scheduled for the 2023/24 financial year.**

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

Recommended infrastructure projects for implementation in the future will be based on the following plans and processes:

- Water and Sewer Master Plans and Water and Waste Water Treatment Works Master Plans.
- Infrastructure replacement needs (Asset Register).
- Budget proposals.
- Asset Management Plans.

Langeberg Municipality's approved 2019/2020 Capital Budget include the following major water and sewerage infrastructure projects, which are planned for the short term (Next three years):

- Upgrading of the filters at the Montagu WTW.
- Extend the De Hoop pipeline to the Gumgrove dam.
- Upgrading of the McGregor WTW.
- Replacement of various sections of the water reticulation networks (Implementation of Pipeline Replacement Programme).
- Upgrading of Muiskraalkop sewerage outflow.
- Upgrade the Robertson WWTW.

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.

The current needs projects are estimated at R56.806 million of which 62% are funded, as included in the 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 Section D, but that the extent of such additional funding can only be determined, once initial investigations and activities have been concluded.

WSDP-IDP WATER SECTOR INPUT REPORT



Table F.1: WSDP FY2019/20: 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 (Dept)	Project Title	Project Cost R'000			
CURRENT NEEDS										
Topic 1: Settlements and Demographics										
	Done by other Department									
Topic 2: Service Levels										
2.1	Some households on the farms without basic water services.	Provide basic water services to the households on the farms without services.	WSDP	No	LB1920001	Install basic water services to the households on the farms without basic services.	R1,500	Yes	No	No
2.2	Some households on the farms without basic sanitation services.	Provide basic sanitation services to the households on the farms without services.	WSDP	No	LB1920002	Install basic sanitation services to the households on the farms without basic services.	R6,000	Yes	No	No
2.3	Some informal areas without basic water services.	Provide communal water services to all households in informal areas without basic water services at a ratio of 25 households per 1 communal tap.	WSDP	No	LB1920003	Install communal water facilities in informal areas without basic water services.	R521	Yes	No	No
2.4	Some informal areas without basic sanitation services.	Provide communal sanitation services to all households in informal areas without basic sanitation services at a ratio of 5 households per 1 communal toilet.	WSDP	No	LB1920004	Install communal sanitation facilities in informal areas without basic sanitation services.	R2,732	Yes	No	No
2.5	Some informal areas with current communal water service levels at a ratio above 25 hh/1 communal tap.	Ensure all informal areas are provided with communal water services at a ratio of 25hh / 1 communal tap.	WSDP	No	LB1920005	Install additional communal taps at the existing informal areas with current communal water service levels at a ratio above 25 hh/1 communal tap.	R368	Yes	No	No
2.6	Some informal areas with current communal sanitation facilities at a ratio above 5 hh/1 communal toilet.	Ensure all informal areas are provided with communal toilet facilities at a ratio of 5hh / 1 communal toilet.	WSDP	No	LB1920006	Install additional communal toilets at the existing informal areas with current communal toilet facilities at a ratio above 5 hh/1 communal toilet.	R2,372	Yes	No	No
2.7	The existing service levels of the primary schools in the rural areas are not known.	Confirm the service levels of the primary schools in the rural areas.	WSDP	No	LB1920007	Service Level Survey of Primary Schools in the rural areas.	R40	Yes	No	No
Topic 3: Water Services Asset Management (Infrastructure)										
3.1	Existing filtration capacity at the Montagu WTW is inadequate and the floors of some of the existing filters are broken.	Upgrade WTW to meet future water treatment requirements.	MTEF	Yes	LB1920008	Upgrading filters in Montagu WTW	R2,500	Yes	Yes	Yes
3.2	Existing filtration capacity at the McGregor WTW is inadequate.	Upgrade WTW to meet future water treatment requirements.	MTEF	Yes	LB1920009	Upgrading McGregor WTW	R6,500	Yes	Yes	Yes
3.3	Capacity of existing bulk sewer pipeline is inadequate.	Upgrade bulk sewer drainage capacity in order to meet future drainage requirements	MTEF	Yes	LB1920010	Upgrading Muiskraalkop Sewerage outflow	R1,000	Yes	Yes	Yes
3.4	Capacity of existing Robertson WWTW is inadequate and various components need to be refurbished.	Upgrade WWTW to meet future wastewater treatment requirements and ensure adequate refurbishment of existing WWTW.	MTEF	Yes	LB1920011	Upgrade Robertson WWTW	R9,557	Yes	Yes	Yes
3.5	Asset Management Plan to ensure adequate refurbishment and replacement of existing water and sewerage infrastructure not yet in place.	Develop an Asset Management Plan to ensure adequate budget allocation towards the operation and maintenance of the existing water and sewerage infrastructure.	WSDP	No	LB1920012	Develop an Asset Management Plan	R650	Yes	No	No
Topic 4: Water Services Operation and Maintenance										
4.1	Submersible pumps are required at Ashton WWTW	Ensure adequate pump capacity at Ashton WWTW	MTEF	Yes	LB1920013	Purchase submersible pumps for Ashton WWTW	R10	Yes	Yes	Yes
4.2	Submersible pumps are required at Robertson WWTW	Ensure adequate pump capacity at Robertson WWTW	MTEF	Yes	LB1920014	Purchase submersible pumps for Robertson WWTW	R10	Yes	Yes	Yes
4.3	Submersible pumps are required at Montagu WWTW	Ensure adequate pump capacity at Montagu WWTW	MTEF	Yes	LB1920015	Purchase submersible pumps for Montagu WWTW	R10	Yes	Yes	Yes
4.4	Submersible pumps are required at Bonnievale WWTW	Ensure adequate pump capacity at Bonnievale WWTW	MTEF	Yes	LB1920016	Purchase submersible pumps for Bonnievale WWTW	R10	Yes	Yes	Yes
4.5	High pressure jetting machine is necessary for possible blockages	Ensure adequate operation of existing sewer network	MTEF	Yes	LB1920017	Purchase high pressure jetting machine for Montagu	R100	Yes	Yes	Yes
4.6	High pressure jetting machine is necessary for possible blockages	Ensure adequate operation of existing sewer network	MTEF	Yes	LB1920018	Purchase high pressure jetting machine for Bonnievale	R100	Yes	Yes	Yes
4.7	All of the required O&M Schedules and checklists are not in place for all the water and sewerage infrastructure.	Ensure required O&M Schedules and Checklists are in place for all water and sewerage infrastructure components.	WSDP	No	LB1920019	Draft required O&M Schedules for all water and sewerage infrastructure.	R250	Yes	No	No
Topic 5: Conservation and Demand Management (Topic 5.1 Water Resources)										
5.1	Regular pipe bursts due to pipe failures result in an increase in the NRW and Water Losses.	Implement Pipeline Replacement Programme to reduce NRW and Water Losses	MTEF	Yes	LB1920020	Replacement of water pipelines: Langeberg	R14,310	Yes	Yes	Yes
5.2	2018/2019 NRW 17.07% and Water Losses 14.25%	25 WC/WDM measures were proposed in the WSDP	WSDP	Yes	LB1920021	Implement the proposed WC/WDM measures	R2,000	Yes	Yes	Yes
5.3	The existing Water and Sewer Master Plans need to be updated.	Regularly update the Water and Sewer Master Plans	WSDP	No	LB1920022	Update the Water and Sewer Master Plans	R1,250	Yes	No	No
Topic 5: Conservation and Demand Management (Topic 5.2 Water Balance)										
5.4	Unmetered erven were identified as part of the Swift process.	Install water meters for all the identified unmetered erven.	WSDP	No	LB1920023	Install water meters for all un-metered water connections.	R1,818	Yes	No	No
5.5	The unmetered erven need to be identified and the age of the existing water meters.	Detail water meter audit for all five towns.	WSDP	No	LB1920024	Detail water meter audit for all five towns.	R800	Yes	No	No
5.6	Additional bulk zone water meters are required.	Ensure adequate bulk water metering	WSDP	No	LB1920025	Installation of new bulk zone water meters, replacement of faulty bulk water meters and ensure adequate protection of existing bulk water meters.	R200	Yes	No	No
5.7	Final effluent discharged from the WWTW is not metered.	Ensure incoming flow and final flow at all the WWTWs are metered.	WSDP	No	LB1920026	Final effluent discharged from the Robertson, Bonnievale, Ashton and Montagu WWTWs to be metered, as well as the incoming flow at the McGregor WWTW.	R250	Yes	No	No
Topic 6: Water Resources										
6.1	Capacity of existing water resources is inadequate to meet the medium to long term future water requirements of Robertson.	Augmentation of the existing water resources for Robertson	MTEF	Yes	LB1920027	Extend De Hoop pipeline to Gumgrove dam	R1,300	Yes	Yes	Yes
6.2	The existing lawful use and registration volumes for all towns not yet known.	Confirm the existing lawful use and registration volumes for all five towns.	WSDP	No	LB1920028	Confirm existing lawful use and registration volumes for all towns.	R50	Yes	Yes	Yes
6.3	Not all industrial consumers are yet monitored regarding the quality of industrial effluent discharged into the sewer system.	Identify all wet industrial consumers and monitor the quality of industrial effluent discharged into the Mun.'s sewer system.	WSDP	No	LB1920029	Industrial effluent monitoring.	R300	Yes	Yes	Yes
6.4	Existing water quality operational sampling programme does not yet fully comply with SANS241:2015 requirements.	Ensure water quality operational sampling programme comply with SANS241:2015 requirements.	WSDP	Yes	LB1920030	Increase water quality operational sampling programme.	R150	Yes	Yes	Yes
6.5	Existing operational sampling programmes at WWTWs can be improved to ensure proper process control.	Increase operational sampling programme at WWTW to ensure proper process control.	WSDP	Yes	LB1920031	Increase wastewater operational sampling programme at WWTWs.	R150	Yes	Yes	Yes
Topic 7: Financial										
	Done by other Department									
Topic 8: Institutional Arrangements and Customer Care										
	Done by other Department									
TOTAL: CURRENT NEEDS							R56,806			
Funded							R35,406			
% Funded							62%			

Table F.1: WSDP FY2019/20: 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 (Dept)	Project Title	Project Cost R'000			
FUTURE NEEDS										
Infrastructure										
F.1	Inadequate capacity of existing bulk water pipelines to meet future requirements	Ensure adequate bulk water pipeline capacity to meet future requirements.	Water Master Plan	No	LB1920032	Future bulk water pipelines required for Bonnievale	R1,089	Yes	No	No
F.2	Inadequate capacity of existing WTW and water quality failures.	Upgrade WTW to meet future water treatment requirements and ensure water quality compliance.	Water Master Plan	No	LB1920033	Future bulk water pipelines required for Montagu	R9,768	Yes	No	No
F.3			WSDP	No	LB1920034	Upgrade Robertson WTW	R17,500	Yes	No	No
F.4			WSDP	No	LB1920035	Upgrade Bonnievale WTW	R17,500	Yes	No	No
F.5			WSDP	No	LB1920036	Upgrade Ashton WTW	R17,500	Yes	No	No
F.6			WSDP	Yes	LB1920037	Upgrade Montagu WTW	R6,500	Yes	Yes	Yes
F.7			Existing WTWs to be refurbished	Ensure adequate water treatment capacity and water quality compliance.	WSDP	No	LB1920038	Refurbishment of Robertson WTW	R195	Yes
F.8	WSDP	No			LB1920039	Refurbishment of McGregor WTW	R240	Yes	No	No
F.9	WSDP	No			LB1920040	Install meter for backwash water at Bonnievale WTW. Ensure bulk raw water meters don't reset after power failures.	R20	Yes	No	No
F.10	WSDP	No			LB1920041	Repair broken filter floors at Montagu WTW.	R200	Yes	No	No
F.11	Inadequate capacity of existing water pump stations to meet future requirements.	Ensure adequate water pump capacity to meet future requirements.	Water Master Plan	No	LB1920042	Future water pump stations required for Robertson	R824	Yes	No	No
F.12			Water Master Plan	No	LB1920043	Future water pump stations required for Ashton	R2,889	Yes	No	No
F.13			Water Master Plan	No	LB1920044	Future water pump stations required for Montagu	R5,318	Yes	No	No
F.14	Existing reservoir storage capacity is inadequate to meet future requirements.	Ensure adequate reservoir storage capacity to meet future requirements.	Water Master Plan	No	LB1920045	Future reservoirs required for Robertson	R23,774	Yes	No	No
F.15			Water Master Plan	No	LB1920046	Future reservoirs required for Bonnievale	R12,109	Yes	No	No
F.16			Water Master Plan	No	LB1920047	Future reservoirs required for Ashton	R36,440	Yes	No	No
F.17			Water Master Plan	No	LB1920048	Future reservoirs required for Montagu	R18,422	Yes	No	No
F.18			Inadequate capacity of existing water reticulation networks to meet future requirements.	Ensure adequate internal water reticulation capacity.	Water Master Plan	No	LB1920049	Upgrade existing water reticulation network for Robertson	R17,463	Yes
F.19	Water Master Plan	No			LB1920050	Upgrade existing water reticulation network for McGregor	R3,361	Yes	No	No
F.20	Water Master Plan	No			LB1920051	Upgrade existing water reticulation network for Bonnievale	R7,433	Yes	No	No
F.21	Water Master Plan	No			LB1920052	Upgrade existing water reticulation network for Ashton	R10,398	Yes	No	No
F.22	Water Master Plan	No			LB1920053	Upgrade existing water reticulation network for Montagu	R11,181	Yes	No	No
F.23	Capacity of existing sewer pump stations is inadequate to meet future requirements.	Ensure adequate sewer pump station capacity.			Sewer Master Plan	No	LB1920054	Future sewer pump stations required for Robertson	R332	Yes
F.24			Sewer Master Plan	No	LB1920055	Future sewer pump stations required for McGregor	R544	Yes	No	No
F.25			Sewer Master Plan	No	LB1920056	Future sewer pump stations required for Bonnievale	R2,886	Yes	No	No
F.26			Sewer Master Plan	No	LB1920057	Future sewer pump stations required for Ashton	R939	Yes	No	No
F.27			Sewer Master Plan	No	LB1920058	Future sewer pump stations required for Montagu	R1,332	Yes	No	No
F.28	Inadequate capacity of bulk sewer pipelines and sewer drainage network capacity to meet future requirements.	Ensure adequate bulk sewer pipeline and internal sewer drainage capacity.	Sewer Master Plan	No	LB1920059	Future bulk sewer pipeline and drainage network required for Robertson	R6,985	Yes	No	No
F.29			Sewer Master Plan	No	LB1920060	Future bulk sewer pipeline and drainage network required for McGregor	R12,573	Yes	No	No
F.30			Sewer Master Plan	No	LB1920061	Future bulk sewer pipeline and drainage network required for Bonnievale	R25,831	Yes	No	No
F.31			Sewer Master Plan	No	LB1920062	Future bulk sewer pipeline and drainage network required for Ashton	R14,042	Yes	No	No
F.32			Sewer Master Plan	No	LB1920063	Future bulk sewer pipeline and drainage network required for Montague	R15,280	Yes	No	No
F.33			Inadequate capacity of existing WWTW and final effluent quality failures.	Upgrade WWTW to meet future treatment requirements and ensure final effluent quality compliance.	WSDP	Yes	LB1920064	Upgrade Robertson WWTW	R45,598	Yes
F.34	WSDP	No			LB1920065	Upgrade McGregor WWTW	R8,000	Yes	No	No
F.35	WSDP	No			LB1920066	Upgrade Bonnievale WWTW	R7,500	Yes	No	No
F.36	WSDP	No			LB1920067	Upgrade Ashton WWTW	R20,139	Yes	No	No
F.37	WSDP	No			LB1920068	Upgrade Montagu WWTW	R7,816	Yes	No	No
F.38	Existing WWTW to be refurbished.	Ensure adequate wastewater treatment capacity and final effluent quality compliance.	WSDP	Yes	LB1920069	Refurbishment of Robertson WWTW	R1,609	Yes	Yes	Yes
F.39			WSDP	No	LB1920070	Refurbishment of McGregor WWTW	R175	Yes	No	No
F.40			WSDP	No	LB1920071	Refurbishment of Bonnievale WWTW	R125	Yes	No	No
F.41			WSDP	No	LB1920072	Refurbishment of Ashton WWTW	R175	Yes	No	No
F.42			WSDP	No	LB1920073	Refurbishment of Montagu WWTW	R315	Yes	No	No
Resources										
F.43	Capacity of the existing water resources for Robertson is inadequate to meet the medium to long term future water requirements.	Augmentation of the existing water resources of Robertson to meet the future water requirements of the town.	WSDP	Yes	LB1920074	Augmentation of the water resources for Robertson for the medium to long term	R5,000	Yes	No	No
F.44	Capacity of the Bonnievale water resources is inadequate.	Augmentation of the existing water resources of Bonnievale to meet the future water requirements of the town.	WSDP	No	LB1920075	Augmentation of the water resources for Bonnievale	R5,000	Yes	No	No
F.45	Capacity of the Ashton water resources is inadequate.	Augmentation of the existing water resources of Ashton to meet the future water requirements of the town.	WSDP	No	LB1920076	Augmentation of the water resources for Ashton	R5,000	Yes	No	No
F.46	Capacity of the Montagu water resources is inadequate.	Augmentation of the existing water resources of Montagu to meet the future water requirements of the town.	WSDP	No	LB1920077	Augmentation of the water resources for Montagu	R5,000	Yes	Yes	Yes
TOTAL: FUTURE NEEDS							R412,318			